TRAÇOS DE PERSONALIDADE E CONSUMO SUSTENTÁVEL

RESUMO

A sustentabilidade ambiental é hoje um tema de muitas discussões, tanto no campo da biologia e ecologia quanto da economia. Entre os desdobramentos dessas discussões estão a realização de fóruns internacionais por parte de governos, a promoção de programas de responsabilidade socioambiental por parte das empresas e a realização de práticas de consumo sustentável por parte de estratos de consumidores que tentam estimular as empresas a adotar um comportamento ecologicamente correto. Nesse estudo abordou-se o fenômeno do consumo sustentável, do ponto de vista do consumidor. Mais especificamente, investigaram-se quais traços de personalidade poderiam ser antecedentes do comportamento de consumo sustentável. O arcabouço teórico utilizado para analisar a relação entre traços de personalidade e comportamento de consumo sustentável foi o Modelo Metateórico de Motivação e Personalidade (Mowen, 2000). Os dados, coletados por meio da aplicação de questionários e analisados com a modelagem de equações estruturais, revelaram que os traços frugalidade e conscienciosidade são os que possuem maior relação com o traço propensão ao comportamento de consumo sustentável, representado pela preferência por compra de produtos ecológicos, economia de recursos e realização da reciclagem de materiais.

Palavras-chave: Consumo Sustentável; Traços de Personalidade; Modelo 3M; Modelagem de Equações Estruturais.

PERSONALITY TRAITS AND SUSTAINABLE CONSUMPTION

ABSTRACT

Currently, environmental sustainability is the subject of many discussions, both in biology and ecology and also in economy. The results of these discussions are shown in international forums promoted by governments, programs of social and environmental responsibility carried out by companies, and sustainable consumption initiatives adopted by consumers trying to make a difference through their consumption. This study analyzes the sustainable consumption phenomenon, from the consumer point of view, investigating which personality traits could be antecedents of sustainable consumption behavior. The theoretical framework used to analyze this relationship was the Metatheoretical Model of Motivation and Personality, proposed by Mowen (2000). The data, collected through questionnaires and analyzed with Structural Equation Modeling-SEM, revealed that the traits "frugality" and "conscientiousness" were the ones with greater relationship with the superficial trait propensity to sustainable consumption behavior, represented by the traits "ecologically-correct purchase", "resources saving" and "recycling".

Keywords: Sustainable Consumption; Personality Traits; 3M Model; Structural Equation Modeling.

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1 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 resulting environmental problems are acute and potentially catastrophic as they tend to worsen. This context led to creation of international forums on sustainability, and the promotion of corrective actions by governments, industries and society. These actions aim to promote nature conservation and quality of life in the long term. So governments celebrate environmental conservation agreements, industries try to develop new production techniques that cause less environmental damages, and consumers are suggested to engage in an ecologically responsible lifestyle and way of consuming.

Fraj and Martinez (2007) and Straughan and Roberts (1999), among others, show some optimism as they point out the increasing of the general interest in sustainable consumption. Nevertheless, the spreading of ecological consciousness has been occurring in a slow rhythm, especially in countries of late industrialization. In Brazil, for example, in average, 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 performing other types of ecologically-oriented behaviors (Instituto Akatu, 2007, 2012).

Considering this context, this study aims to analyze the antecedents of sustainable consumption behavior, trying to figure out personality traits that promote this kind of behavior. Personality traits are part of the psychology realm, so to study the relationship between them and the propensity to sustainable consumption, it was chosen the psychological perspective of traits (Friedman and Schustack, 2004).

This perspective was chosen among others (psychoanalytic, neo-analytical, biological, cognitive, humanist and interactional) because it offers research advantages. According to Pervin (2003), this perspective allows: (i) the correlational research; (ii) the use of surveys to collect data; (iii) the study of a high number of variables and the relationship among them. This relationship analysis can be performed by models such as the Ajzen´s Theory of Planned Behaviour, or the Mowen´s 3M Model of Motivation and Personality. Due to context methodological conveniences (availability of bibliographic material and empirical support), the present research adopted the 3M Model of Motivation and Personality (Mowen, 2000) for the

analysis of personality traits related to sustainable consumption.

To accomplish the proposed objective, this study begins presenting a brief literature review about sustainability, ecologically conscious consumption, sustainable consumption and the 3M Model. Based on this theoretical background, the research hierarchical model and the main constructs are presented. Then, section 3 exposes the hypotheses development and section 4 outlines the study's methodological features. Section 5 presents the 3M Model results, based on exploratory and confirmatory factor analyses. Concluding the research, section 6 analyzes the findings and its implications, as well as future research proposals and limitations of the present investigation.

2 THEORETICAL BACKGROUND

2.1 Sustainability and Sustainable Development

The term "sustainability", in the 1970's, was defined as the capacity of an ecosystem keeps its resilience under human aggression (Veiga, 2010). An example is the fishing industry operating to the point of not compromising the reproduction and the population of fish shoals. The term "development" was added in the 1980's, and until today there is no agreement about the concept of sustainable development. Veiga (2010) argues that this case is almost like the case of the term "social justice": these terms express values, and values are hard to define.

In fact, the definition of unsustainable is easier to elaborate, since phenomena such as global warming and biodiversity erosion are perceivable and measurable. These phenomena refer to another area of knowledge: the economy (Veiga, 2010). Since global warming and biodiversity erosion are, in part, consequences of economic activities, the compatibility between current continuous economic development and sustainability are considered unlikely. According to Sen (2000), the concept of development must encompass the process of expanding human freedom, emphasizing welfare, democracy and peace.

In order to measure and compare different countries, indexes of welfare and sustainability were created. The Measure of Economic Welfare – MEW, was the base to the Index of Sustainable Economic Welfare, that was applied in countries such as Canada, Scotland, Sweden, Chile, Australia and Thailand. In 2004, this index was renamed as Genuine Progress Index – GPI by the American non-governmental organization Redefining Progress (Veiga, 2010).

From this point on, progress, economic growth and development are affected by aspects as

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environment damage, depletion of natural resources and high level of CO_2 emission. On the other hand, firms began to try to contribute to sustainability by adopting new energy sources, using recycled raw materials and developing environmentally friendly products such as hybrid vehicles (Veiga, 2010). This behavior is due to, in part, a demand from organization's stakeholders who want the company to elaborate strategic plans regarding environment and social policies and corporative social responsibility (Welsh & Herremans, 1998). One of the organization's stakeholders is the consumer, more specifically the ones who want to keep the sustainability (for the sake of current and future generations) through the consumption of environmentally friendly products. This issue is discussed in the next topic.

2.2 Sustainable Consumption

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 a strategic priority to citizens, countries and organizations (Ottman, 2010; 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.

Balance in environmental and economic goals is pursued by environmentalists, government, and now-enlightened entrepreneurs and managers (Friend, 2009; Ottman, 2010). But, even though green business is rapidly shifting from a movement to a market, the green economy has remained challenging and elusive for most companies (Makower, 2009). Besides, there is a gulf between green concern and green consumerism.

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. A "green market" expanded to a considerable rate in the developed countries (Follows & Jober 2000; Peattie 2001), and it is now large and rapidly growing (Friend, 2009; Green Brands Survey, 2011). In the United States, for example, the "lifestyles of health and sustainability" (LOHAS) consumer market was conservatively estimated at 209 billion dollars in 2005. For this estimate, the most relevant markets were personal health, green building, eco-tourism, natural life-styles and alternative vehicles.

Research done in the 1970's (e.g., Kassarjian, 1971; Kinnear, Taylor, & Ahmed, 1974) prioritized the analyses of values, attitudes and behavior of ecologically-oriented consumers, as well as the investigation of means to reach them more effectively. After 2000, the main research direction was shifted to the examining not only of concerns, but of actual behavior, mostly pro-environmental purchasing behavior (Cleveland, Kalamas, & Laroche, 2005; Fraj & Martinez, 2006; among others). In fact, few researchers had investigated other behaviors besides "green buying" (Fraj & Martinez, 2006).

Regarding the determinants of ecological behaviors, research findings of the 1990's and 2000's indicate that demographics could provide useful information but no worldwide accepted demographic profile of ecologically conscious consumers; the psychographic profile remained rather vague, although research focusing on values had been considerably broadened; a certain link, usually moderate, had been indicated between specific attitudes and ecological behaviors and environmental knowledge had been examined only in a few studies (Tilikidou, 2013). In overall, it is necessary to understand some puzzle findings, such as the gap between the strong pro-environment attitudes and the limited growth either in green purchases or in recycling compliance.

Although the marketing focus of ecologically conscious consumption is related to the trading of ecologically correct products, which have small or none negative environment impact (Fraj & Martinez, 2007; Peattie, 2001; Roberts, 1996), this research assumes that sustainable consumption (SC) must be widely understood, including activities and everyday consumer practices like the reduction of water, materials and energy consumption, the active participation in recycling, the support for environment-friendly companies and the economy of resources. In fact, sustainable consumption should be understood in the perspective of the consumer behavior concept, defined as "those actions directly involved in **obtaining, consuming** and **disposing** of products and services, including the decision processes that precede and follow these actions" (Engel, Blackwell, & Miniard, 2000, p. 4, emphasis added). Or, as remembered by Solomon (2002, p. 24, emphasis added), the consumer behavior area is concerned about "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 these definitions and on the literature review about ecologically conscious consumption, it is suggested a broad understanding of sustainable consumption as: "the search for ecologically-correct products and services, the preference for corporations and organizations

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actively engaged in environment conservation, the saving of resources such as water and energy, the using of materials and equipment up to the end of its life service, the reusing, whenever possible, the right destination of residuals to recycling and the propensity to a lifestyle with a smaller negative environmental impact".

Aimed at complementing previous studies, the adopted perspective is essentially based on a concept of sustainable consumption tied not only to the whole consumption cycle, that is, acquisition, use and disposal, but also as a conscious lifestyle with political connotations. This is coherent to the usual concerns about supporting companies and institutions that are ecologically responsible, but also includes actions like saving the natural resources and recycling materials. In essence, the adopted perspective of sustainable consumption implies in a more careful and less consumerist lifestyle, that consequently has a smaller negative environmental impact.

In order to investigate this careful and less consumerist behavior, it is necessary to enter the domain of psychology, more specifically the area studying the relationship between personality traits and behavior. According to Friedman and Schustack (2004), there are eight aspects that together help defining and understanding the personality: the unconscious aspects (motivation driven by unconscious desires), ego forces (feelings of identity or Self), the biological aspects (genetic nature of people), cultural aspects (modeling and cultural conditioning), the cognitive aspects (so that each person interprets the experience) traits aspects (set of traits, specific skills and predispositions of each individual), the spiritual aspects (everything that makes humans ponder the meaning of their existence, seeking happiness and satisfaction) and finally, aspects of continuous interactions between people and the environment.

From the emphasis on each one of these aspects, several theories of personality had been developed. These theories can be grouped into seven perspectives, as proposed by Friedman and Schustack (2004): Psychoanalytic, neo-analytical, biological, cognitive, traits, humanist and interactional. In the scientific study of personality, on the other hand, Pervin (2003) cite three research traditions: (i) clinic; (ii) experimental and (iii) correlational.

The clinic tradition aims to systematize clinical observations and explain them with psychology theories. This tradition presents the limitation of the subjective interpretation of the observations. The experimental tradition involves systematic variables manipulation in order to find causal relationships. This tradition demands an artificial scenario that can be hard to reproduce in

laboratories. The correlational tradition uses statistical measurements to find correlations among sets of variables that distinguish an individual from other (Pervin, 2003).

The use of statistical measurements allows the study of a large number of variables, and the data collection via questionnaires. This research tradition employs as analysis tool statistical techniques such as structural equations modeling, and defined the trait as the personality fundamental unit. Due to methodological conveniences of availability of bibliographic material and empirical support, this study adopted the traits perspective and the correlational research tradition. This decision led to adoption of the theoretical framework of the 3M theory. In the next topic, a brief description of this theory is made.

2.3 The 3M - A *M*etatheorical *M*odel of *M*otivation and Personality and traits related to sustainable consumption

The 3M Model is a metatheory that integrates control theory, evolutionary psychology principles, and elements of the hierarchical trait theories (Mowen, 2000). This model provides a four-level hierarchical 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 & Mowen, 2006) and propensity to undergo cosmetic surgery (Mowen, Longoria, & Sallee, 2009).

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: emotional instability, openness to experiences, agreeableness, extraversion, conscientiousness, need for body resources, need for material resources, and need for arousal. The last three elemental traits extend the set of personality traits of the five-factor model (McCrae & Costa, 1997).

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, two compound traits were investigated: general self-efficacy (Mowen, 2000) and altruism (Stern, 2000).

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Compound traits were based on literature. The first one was self-efficacy, a trait related to one's own capacity of succeeding in performing tasks, irrespective of chance. Self-efficacy influences the performance of types of behavior which demand commitment and persistence to overcome difficulties (Bandura, 1977 *apud* Mowen, 2000) and is positively related to the engagement in ecologically-oriented behaviors (e.g., Antonetti & Maklan, 2014; Bodur & Sarigöllu, 2005; Cleveland, Kalamas, & Laroche, 2005; Straughan & Roberts, 1999). As sustainable consumption behaviors require a high level of engagement by individuals, general self-efficacy was proposed as an antecedent of sustainable consumption.

For its turn, altruism can be understood as a value or as a personality trait. Many studies found relationships among altruism, concern with the environment and ecologically-oriented behaviors (e.g., Ebreo & Vining, 2001; Stern, 2000, Straughan & Roberts, 1999). Because environmental quality is a public good, altruistic motives are necessary for an individual to contribute to it in a significant way (Heberlein, 1972 *apud* Stern, 2000).

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 traits initially proposed in this study were environmental concern, consumerism and frugality. Nonetheless, as the first two constructs presented problems of lack of discriminant validity and lack of mediation effect with other latent variables of the study, only frugality was retained for subsequent analyses.

Frugality is a consumer behavior aligned to consumption habits (Lastovicka, Bettencourt, Hughner, & Kuntze, 1999). Frugal consumers typically achieve long-term goals through the denial of short-term whims and the creative use of resources (Todd & Lawson, 2003). They are also concerned about avoiding waste and carefully using the resources (De Young, 2000). Indeed, frugal people are inclined to have a simpler and less consumerist lifestyle, what implies in ecologically favorable behaviors (Shaw & Moraes, 2009).

At the most concrete level of the 3M model, superficial traits represent enduring dispositions to act within category-specific contexts (Mowen, 2000). They have a strong behavioral component,

resulting from the combined effects of elemental, compound, situational traits, and the press of the specific situational context.
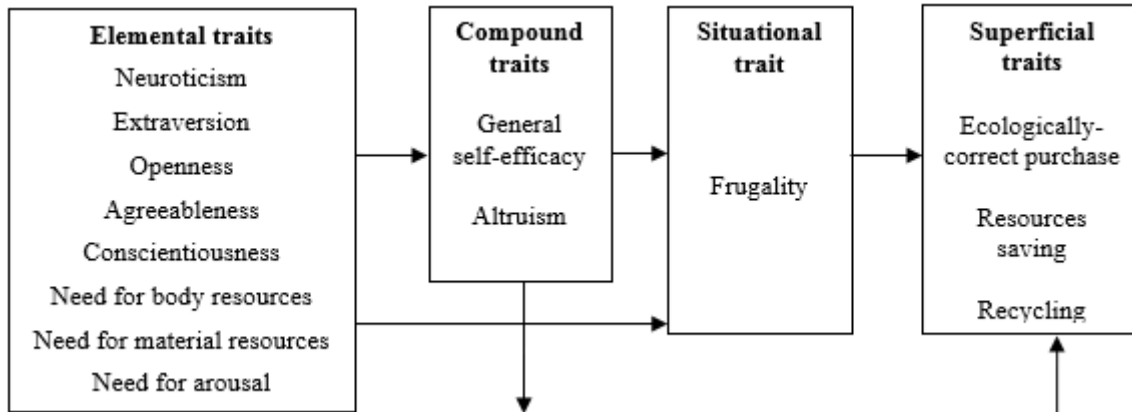
2.4 Criticisms of 3M model

One of the criticisms of the 3M model is related to the measurements properties of the scales employed. Questions about validity and reliability of the scales measuring the traits often appear: can personality traits be adequately measured by three or four item scales, when traditional scales consist of ten or more items? Have the traits develop for the 3M been shown to have validity and reliability (Mowen, 2000)?

To answer the first question, Mowen (2000) cites that even with four items, the scales show high internal reliabilities as the result of high Alphas' coefficients, suggesting that "the items are measuring the common core of the domain of each construct" (Mowen, 2000, p.270). Another advantage of four item scales is the low number of degrees of freedom in the structural model, which permits analysis with samples sizes practical to obtain.

Regarding the validity and reliability of the scales, Mowen (2000) postulates that the studies' results demonstrated that the traits have good internal reliability and good predictive validity. The results have shown construct, discriminant and nomological validity, including nomological validity of the four level hierarchical structure. However, as Mowen (2000) cites, much more work is necessary to assess reliability and validity issues. This study represents a contribution to these issues, because it reinforces the scales validity and reliability in another context. In the next topic, the research structural model is explained.

2.5 3M model applied to the study of sustainable consuming behavior

Based on the concept of sustainable consumption, ecologically-correct purchase, resources saving and recycling were proposed as superficial traits in this research. Figure 1 portrays the 3M hierarchical model depicting the compound, situational and superficial traits proposed.

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Elemental traits	Compound traits	Situational trait	Superficial traits
Neuroticism	General self-efficacy	Frugality	Ecologically-correct purchase
Extraversion	Altruism		
Openness			Resources saving
Agreeableness			
Conscientiousness			Recycling
Need for body resources			
Need for material resources			
Need for arousal			

Each of these traits was measured by a scale. Table 1 below shows the scale items of each compound, situational and superficial traits, and the correspondent alpha coefficient. The scales measuring elemental traits were tested by Mowen (2000) and had shown internal consistency and reliability, according to the values obtained from the Cronbach's alphas.

Table 1 - Compound, Situational and Superficial Traits comprising the model

Factor	Variable	Item-total correlation	Item description	Theoretical References
Self-efficacy (*)				
Cronbach's alpha = .74	i25	.32	I feel in control of what is happening to me.	Mowen (2000)
AII = .42	i34	.53	I find once I make up my mind, I can accomplish my goals.	
CC = .66; AVE = .34	i40	.66	I have persistence to reach my goals.	
	i47	.65	I have a great deal of self will power.	
Altruism (*)				
Cronbach's alpha = .64	i23	.43	I am concerned with all people.	Schultz (2000)
AII = .37	i27	.41	I am concerned with children.	
CC = .61; AVE = .35	i31	.40	I am concerned with people in the society.	
Frugality (**)				
Cronbach's alpha = .67	i5	.50	Finding ways to use things over and over.	De Young (2000)
AII = .50	i10	.50	Repairing rather than throwing things away.	
CC = .68; AVE = .52				

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(conclusion)

Factor Ecologically-correct purchase (***)	Variable	Item-total correlation	Item description	Theoretical References
Cronbach's alpha = .77	i1	.49	I usually read products' labels to see with there is information about care with the environment.	Ottman (1998) Thapa (1999)
AII = .46 CC = .81; AVE = .52	i3	.60	When buying products, I prefer the ones that use packages which can be recycled.	Maloney, Ward and Braucht (1975) Roberts (1996) Ottman (1998)
	i12	.56	I stop buying from companies which doesn't show concern for the protection of the environment.	Straughan and Roberts (1999) Thapa (1999) Maloney *et al.* (1975) Stone, Barnes and Montgomery (1995) Roberts (1996) Ottman (1998) Straughan and Roberts (1999) Thapa (1999)
	i14	.65	I change my brand preferences to support companies that show more concern for the protection of environment.	Maloney *et al.* (1975) Roberts (1996) Ottman (1998) Straughan and Roberts (1999) Thapa (1999)
Resources saving (***) Cronbach's alpha = .62	i16	.45	I let television and computer on even when not using them. (reverse)	Roberts (1996) Straughan and Roberts (1999)
AII = .35	i21	.29	I turn off the taps when soaping or washing dishes.	Instituto Akatu (2007) Gonçalves-Dias, Teodósio, Carvalho and Silva (2009)
CC = .64; AVE = .39	i22	.51	I let lights on without need. (reverse)	Instituto Akatu (2007) Gonçalves-Dias *et al.* (2009)
Recycling (***)	i2	.85	I separate metal objects (e.g. cans) for recycling.	Thapa (1999)
Cronbach's alpha = .94	i11	.91	I separate glass (e.g. beer bottles) for recycling.	Thapa (1999)
AII = .80	i20	.80	I separate paper for recycling.	Thapa (1999)
CC = .76; AVE = .76	i23	.89	I separate plastic packaging (e.g. plastic bottles, plastic bags etc.) for recycling.	Thapa (1999)

Notes: (1): AII – Average inter-item correlations;
(2): (*) compound trait, (**) situational trait; (***) superficial trait.

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3 HYPOTHESES DEVELOPMENT

As recommended by Mowen (2000), all eight elemental traits were included in the research model as control variables. Proposed relationships among elemental traits and traits of other hierarchical levels were based on literature and logical analysis. The inclusion of these elementary personality traits assumes the potential direct influence of individual genetics and learning history of early childhood on sustainable consumption.

According to Borden and Francis (1978) people more concerned about environment tend to be more mature, responsible, sociable, and conscientious then the ones who are not concerned. Fraj and Martinez (2006) say that ecologically-correct consumers have higher scores in measures of extraversion (sociability), amiability (agreeability) and consciousness. Ramanaiah, Clump and Sharpe (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, Veiga, Gosling and Gonçalves (2008) observed that people who are more agreeable, creative and conscientious are more likely to strive for a balance between nature and modern life. The literature review results indicate that neuroticism, need for material resources and need for arousal are traits not present in individuals prone to sustainable consumption and concern for the environment, so no hypothesis were developed relating to these constructs.

Based on studies of Ottman (1998), Thapa (1999), Roberts (1996) e Gonçalves-Dias *et al.* (2009), the result of logical analysis shows that ecologically-correct purchase , resources saving and recycling are traits present in individuals concerned with the environment. So the following relationships were hypothesized:

H1a: *Conscientiousness* is positively related with *ecologically-correct purchase.*
H1b: *Conscientiousness* is positively related with *resources saving*.
H1c: *Conscientiousness* is positively related with *recycling*.
H2a: *Openness to experience* is positively related with *ecologically-correct purchase*.
H2b: *Openness to experience* is positively related with *resources saving*.
H2c: *Openness to experience* is positively related with *recycling*.
H3a: *Agreeableness* is positively related with *ecologically-correct purchase*.
H3b: *Agreeableness* is positively related with *resources saving*.
H3c: *Agreeableness* is positively related with *recycling*.

H4a: *Extraversion* is positively related with *ecologically-correct purchase.*
H4b: *Extraversion* is positively related with *resources saving*.
H4c: *Extraversion* is positively related with *recycling*.

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

H5a: *The need for body resources* is positively related with *ecologically-correct purchase*.
H5b: *The need for body resources* is positively related with *resources saving*.
H5c: *The need for body resources* is positively related with *recycling*.

As empirical studies demonstrate that self-efficacy and altruism are personality traits typical of ecologically-correct consumers (Antonetti & Maklan, 2014; Bodur & Sarigöllu, 2005; Cleveland, Kalamas, & Laroche, 2005; Ebreo & Vining, 2001; Stern, 2000; Straughan & Roberts, 1999), the following hypotheses about the compound traits were proposed:

H6a: *Altruism* is positively related with *ecologically-correct purchase*.
H6b: *Altruism* is positively related with *resources saving*.
H6c: *Altruism* is positively related with *recycling*.
H7a: *General self-efficacy* is positively related with *ecologically-correct purchase*.
H7b: *General self-efficacy* is positively related with *resources saving*.
H7c: *General self-efficacy* is positively related with *recycling*.

In the situational trait's level, associations between frugality and sustainable consumption behaviors were investigated. As frugal consumers are more conscious in acquiring goods and resourceful in using them (Lastovicka *et al.*, 1999), it is expected that this lifestyle will reinforce the behaviors proposed as superficial traits in this research.

H8a: *Frugality* is positively related with *ecologically-correct purchase*.
H8b: *Frugality* is positively related with *resources saving*.
H8c: *Frugality* is positively related with *recycling*.

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Furthermore, in a hierarchical model, constructs in the higher levels of the hierarchy are supposed to cause a partial mediation effect at least (Baron & Kenny, 1986). If frugality is a less abstract trait, then it should be found that it mediates the effects of altruism and self-efficacy on the sustainable consumption measures, defined as ecologically-correct purchase, resources saving and recycling. Therefore:

H9a: *Altruism* is positively related with *frugality*.
H9b: *Self-efficacy* is positively related with *frugality*.
H9c: *Frugality* mediates the effects of *altruism* on *ecologically-correct purchase*.
H9d: *Frugality* mediates the effects of *altruism* on *resources saving*.
H9e: *Frugality* mediates the effects of *altruism* on *recycling*.
H9f: *Frugality* mediates the effects of *self-efficacy* on *ecologically-correct purchase*.
H9g: *Frugality* mediates the effects of *self-efficacy* on *resources saving*.
H9h: *Frugality* mediates the effects of *self-efficacy* on *recycling*.

4 METHOD

4.1 Measures

The scale items of the compound, situational and superficial traits were developed by Mowen (2000), Schultz (2000) and De Young (2000). In order to retain the strongest items of each scale, an exploratory factor analysis using principal component analysis and orthogonal rotation (varimax) was performed, using SPSS version 17. After this analysis, twenty items were retained to operationalize self-efficacy, altruism, frugality, ecologically-correct purchase, resources saving and recycling. Only the non-ambiguous items which loaded more strongly on the respective factors were selected. As a result, factor unidimensionality was reached. See Table 1 for more information.

4.2 Data collection, sample characteristics and general information

College students of different undergraduate courses of the same Brazilian university completed the survey. The data collection obtained 512 valid questionnaires over a 2 week-time period. The mean age was 22.8 years, and 50.1 per cent were women. 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.

Exploratory data analysis was carried out by employing SPSS version 17. Missing data was almost negligible. Only 0.2% of item data were missing. Their distribution was considered as completely at random (MCAR Little's test: chi-square = 197.976, df = 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 select single items to represent the elemental traits and to refine the items of *self-efficacy, altruism, frugality, ecologically-correct purchase, resources saving* and *recycling*. The smallest one (n = 200) was used to estimate the 3M research hierarchical model.

In the sequence, the 3M Model results are presented: firstly, a hierarchical regression analysis was made to test the mediation effects found in the model. Next, correlation and SEM analysis were carried out to see if there was any case of illusory prediction (Mowen & Voss, 2008; Mowen *et al.,* 2009), to verify the sustainable consumption measures percentage of explained variance and the hypothesis test model fit statistics.

5 3M MODEL RESULTS

5.1 Hierarchical Regression Analysis

A series of regression analyses were employed to analyze the data. First, frugality was regressed on the elemental and compound traits, finding that altruism (t = 2.68, p < .01) was a statistically significant predictor of frugality, providing support for hypothesis 9a. Hypothesis 9b, that concerned the relation between self-efficacy and frugality, was not supported. Following, it was hypothesized that frugality mediates the effects of altruism and self-efficacy on ecologically-correct purchase, resources saving and recycling in hypothesis 9c to hypothesis 9h. These hypotheses were tested simultaneously using a modified version of the procedure outlined by Baron and Kenny (1986) for testing for mediation. The full model results are presented in Table 2 (A).

The hypothesized mediating effects of frugality between the more abstract traits and sustainable consumption measures were tested, by comparing the two models shown in Table 2 (B, C and D). In first model, the sustainable consumption measures were regressed on the eight elemental traits and the two compound traits, finding that altruism was a significant predictor of both ecologically-correct purchase (t = 4.33, p <.01) and resources

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saving ($t = 3.47$, $p < .01$). Self-efficacy was a significant predictor only of resources saving ($t = 2.17$, $p < .05$). Recycling did not present any of the hypothesized compound traits as a significant predictor.

In the second model, frugality was added as a predictor of ecologically-correct purchase (ECP), resources saving (RS) and recycling (REC) (see Table 2 below [B, C, and D] – Model 2). The beta coefficients revealed that frugality exerts a positive influence on ECP ($t = 6.12$, $p < .01$), RS ($t = 4.04$, $p < .01$) and REC ($t = 4.70$, $p < .01$), providing clear

support for hypothesis H8a, H8b and H8c. Nevertheless, the effects of altruism on ECP ($t = 3.47$, $p < .01$) and on RS ($t = 1.77$, $p < .10$), and the effects of self-efficacy on RS ($t = 2.68$, $p < .05$) remained significant with frugality in the model, which suggests that the effects of both compound traits were partially mediated by frugality. So, hypothesis 9c, 9d and 9g were confirmed, even though there was not detected a full mediation, but a partial one. For the case of recycling, no mediation effect was found, rejecting hypothesis 9e and 9h.

Table 2 - Beta Coefficients for Hierarchical Regression Analysis (N = 200)

	(A)	(B)		(C)		(D)	
	DV = Frugality	DV = Ecologically-correct purchase		DV = Resources saving		DV = Recycling	
	Model	Model		Model		Model	
	1	1	2	1	2	1	2
Elemental traits							
Conscientiousness	.24***	.14*	.04	.17**	.10	.06	-.03
Extraversion	-.06	-.03	-.01	.02	.04	.11	.13*
Openness	.10	.11	.07	-.10	-.13*	.17**	.14*
Emotional inst.	.12	.04	-.01	.02	-.01	.01	-.03
Agreeableness	.08	.01	-.02	-.09	-.11	-.08	-.10
Material res.	-.26***	-.15**	-.05	-.24***	-.16**	-.17**	-.08
Body resources	.10	.08	.04	.07	.04	.17**	.14*
Arousal	.07	.06	.03	.08	.06	.05	.03
Compound traits							
Altruism	.20**	.032***	.24***	.19**	.13***	.04	-.03
Self-efficacy	-.11	.05	.09	.17**	.20**	.03	.07
Situational trait							
Frugality	-	-	.40***	-	.29***	-	.34***
Superficial traits							
Ecologically-correct purchase	-	-	-	-	-	-	
Resources saving	-	-	-	-	-	-	
Recycling	-	-	-	-	-	-	
Adjusted R²	16.1	18.7	31.9	13.4	19.9	5.9	

Note: DV = dependent variable.
*p < .10; ** p < .05; *** p < .01

5.2 Correlation results

Table 3 presents the correlations of the elemental, compound and situational traits with ecologically-correct purchase, resources saving and recycling. With one exception, which refers to

extraversion, the results supported the hypotheses for ecologically-correct purchase. So, conscientiousness, openness, agreeableness, need for body resources, altruism, self-efficacy and frugality were positively related to ecologically-correct purchase.

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Table 3 - Test of hypotheses

Predictor constructs	ECP superficial trait		RS superficial trait		REC superficial trait	
	Correlation r-values	SEM t-values	Correlation r-values	SEM t-values	Correlation r-values	SEM t-values
Conscientiousness	.20***	-.20	.21***	1.83*	.11	-.52
Extraversion	.07	.53	.08	-1.62	.13	.65
Openness	.18*	-.71	-.04	-1.17	.17**	1.63*
Emotional inst. (not hyp.)	-.09	-	-.04	-	-.06	-
Agreeableness	.22***	-1.83*	.10	-1.04	.06	-2.22**
Material res. (not hyp.)	-.13	-	-.20***	-	-.09	-
Body resources	.18**	-.47	.13	-.14	.19***	1.10
Arousal (not hyp.)	.11	-	.03	-	.09	-
Altruism	.41***	2.88***	.25***	.95	.14*	.62
Self-efficacy	.20***	1.41	.22***	2.55**	.10	.18
Frugality	.51***	2.96***	.37***	2.04**	.37***	3.36***

Note: SEM = structural modeling analysis.
*** p < .01;   ** p < .05;   *p < .10. All tests are 2-tailed.

For the resources saving construct, four of the hypotheses were not supported: extraversion, openness, agreeableness and need for body resources were not related to it. On the other side, conscientiousness, need for material resources (not hypothesized), altruism, self-efficacy and frugality were related to resources saving.

In the case of recycling, also four of the hypotheses were not supported. The expected positive relationships between conscientiousness and recycling (H1c), agreeableness and recycling (H3c), extraversion and recycling (H4c) and self-efficacy and recycling (H7c) were not found. Nonetheless, the associations between openness and recycling (H2c), need for body resources and recycling (H5c), and frugality and recycling (H8c) were confirmed.

Another goal of this research was to compare and contrast the trait predictors of ecologically-correct purchase, resources saving and recycling. One special finding of the correlation analysis was that altruism and frugality predicted all these constructs simultaneously. Also, the results

revealed that agreeableness was only associated with ecologically-correct purchase, conscientiousness and self-efficacy were only related to ecologically-correct purchase and resources saving; and openness and body resources were only predictors of ecologically-correct purchase and recycling. Contrary to expected, extraversion did not present any positive relationship with the sustainable consumption measures. In addition, one unpredicted but not surprising effect was found, that is, the negative relationship between the material resources trait and resources saving.

The correlation analysis also allowed the investigation of the elemental trait predictors of altruism and frugality, the most significant predictors of sustainable consumption. In this sense, agreeableness, conscientiousness and need for body resources were positively related with both altruism and frugality.

The results of regression analysis and correlations are presented in Table 4, with the conclusions of the test of hypotheses:

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Table 4 - Conclusions of the test of hypotheses

HYPOTHESES	CONCLUSION
H1a: *Conscientiousness* is positively related with *ecologically-correct purchase.*	supported
H1b: *Conscientiousness* is positively related with *resources saving.*	supported
H1c: *Conscientiousness* is positively related with *recycling.*	rejected
H2a: *Openness to experience* is positively related with *ecologically-correct purchase.*	supported
H2b: *Openness to experience* is positively related with *resources saving.*	rejected
H2c: *Openness to experience* is positively related with *recycling.*	supported
H3a: *Agreeableness* is positively related with *ecologically-correct purchase.*	supported
H3b: *Agreeableness* is positively related with *resources saving.*	rejected
H3c: *Agreeableness* is positively related with *recycling.*	rejected
H4a: *Extraversion* is positively related with *ecologically-correct purchase.*	rejected
H4b: *Extraversion* is positively related with *resources saving.*	rejected
H4c: *Extraversion* is positively related with *recycling.*	rejected
H5a: *The need for body resources* is positively related with *ecologically-correct purchase.*	supported
H5b: *The need for body resources* is positively related with *resources saving.*	rejected
H5c: *The need for body resources* is positively related with *recycling.*	supported
H6a: *Altruism* is positively related with *ecologically-correct purchase.*	supported
H6b: *Altruism* is positively related with *resources saving.*	supported
H6c: *Altruism* is positively related with *recycling.*	supported
H7a: *General self-efficacy* is positively related with *ecologically-correct purchase.*	supported
H7b: *General self-efficacy* is positively related with *resources saving.*	supported
H7c: *General self-efficacy* is positively related with *recycling.*	rejected
H8a: *Frugality* is positively related with *ecologically-correct purchase.*	supported
H8b: *Frugality* is positively related with *resources saving.*	supported
H8c: *Frugality* is positively related with *recycling.*	supported
H9a: *Altruism* is positively related with *frugality.*	supported
H9b: *Self-efficacy* is positively related with *frugality.*	rejected
H9c: *Frugality* mediates the effects of *altruism* on *ecologically-correct purchase.*	supported
H9d: *Frugality* mediates the effects of *altruism* on *resources saving.*	supported
H9e: *Frugality* mediates the effects of *altruism* on *recycling.*	rejected
H9f: *Frugality* mediates the effects of *self-efficacy* on *ecologically-correct purchase.*	supported
H9g: *Frugality* mediates the effects of *self-efficacy* on *resources saving.*	supported
H9h: *Frugality* mediates the effects of *self-efficacy* on *recycling.*	rejected

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5.3 SEM results

Firstly, the measurement model was assessed. All traits were included, but the elemental traits were represented only by a single item. Although chi-square was significant, RMSEA and the incremental fit statists were satisfactory (χ^2 = 383.025, df = 267, $p < 0,01$, χ^2 / df = 1.435, CFI = .93, TLI = .90, RMSEA = 0.047). Composite reliability and coefficient alphas for all constructs were all above 0.60. Bivariate correlations among constructs were not above 0.60, so discriminant validity was assumed.

The full hierarchical model was analyzed via structural modeling using Amos 16.0. Consistent with Mowen *et al.* (2009) recommendation, single-item indicators were used for the elemental traits. A partial mediation model was employed in which paths were run from the elemental traits to the compound, situational, and superficial traits. Similarly, paths were run from the compound traits to the situational and superficial traits. Paths were also run from the situational to the superficial traits. The fit indices for the model were satisfactory (χ^2 = 410.970, df = 285, $p < 0,01$, χ^2 / df = 1.442, CFI = 0.92, TLI = 0.90, RMSEA = 0.047). The structural model, indicating the supported hypotheses is shown in Figure 2:

Figure 2 - Structural model
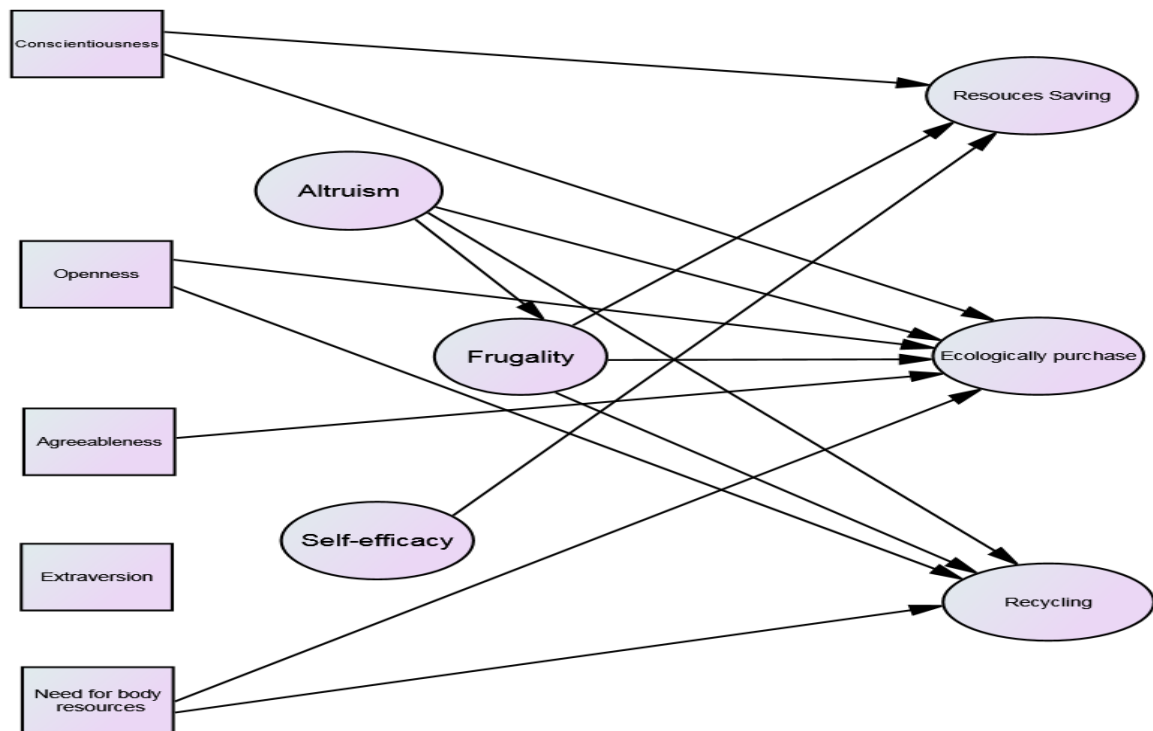
For ecologically-correct purchase, the model accounted for 49.8 per cent of its variance. The results revealed the following significant predictors: agreeableness (t = -1.83, $p < .07$), altruism (t = 2.88, $p < .01$) and frugality (t = 2.96, $p < .01$). For resources saving, the model accounted for 27.7 per cent of its variance. Significant predictors were self-efficacy (t = 2.55, $p < .02$) and frugality (t = 2.04, $p < .05$). For recycling, the model accounted for 27.2 per cent of its variance. Significant predictors were: openness (t = 1.63, $p < .10$), agreeableness (t = -2.22, $p < .05$) and frugality (t = 3.36, $p < .01$).

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The trait predictors of self-efficacy, altruism and frugality were also investigated. The bivariate correlation between self-efficacy and altruism was reasonable ($r = .20$, $p < .01$). The model accounted for 10.6 per cent of the variance in self-efficacy, and its significant predictors were conscientiousness ($t = 2.09$, $p < .05$) and openness ($t = 1.66$, $p < .10$). For altruism, the model accounted for 42.8 per cent of it variance. Five elemental traits were significant predictors: agreeableness ($t = 5.28$, $p < .01$), openness ($t = 1.95$, $p < .06$), need for body resources ($t = 2.36$, $p < .05$), need for material resources ($t = -2.66$, $p < .01$) and emotional instability ($t = -2.34$, $p < .05$). Finally, the model accounted for 37.2 per cent of the variance in frugality. Conscientiousness ($t = 1.63$, $p = .10$) and altruism ($t = 4.71$, $p < .01$) were significant predictors.

5.4 Analyzing illusory relationships

A comparison of the correlation results with the SEM results revealed evidence of illusory prediction (Mowen & Voss, 2008). Illusory prediction occurs when bivariate correlations are used to test nomological validity rather than a hierarchical model (Mowen *et al.*, 2009). In this sense, the correlation analysis revealed a positive relationship between altruism and resources saving ($r = .25$, $p < .01$). When the full set of traits was included in the SEM analysis, however, the effect was lost ($p > .10$).

These results indicate that altruism is not associated with resources saving. Rather, one of the antecedents of altruism accounts for the relationships; additional analyses revealed that conscientiousness caused the relationship. That is, conscientiousness was positively associated with altruism ($r = .18$, $p < .01$) and with resources saving ($r = .21$, $p < .01$). As a result, when conscientiousness was added to the analysis, the relationship between altruism and resources saving was no longer significant. Thus, the relationship between altruism and resources saving was illusory because it results from the association of an antecedent construct (i.e., conscientiousness) with the two focal constructs. A similar observation can be made for the relationship between self-efficacy and ecologically-correct purchase.

The correlation analysis revealed a positive relationship between self-efficacy and ecologically-correct purchase ($r = .20$, $p < .01$). When the full set of traits was included in the SEM analysis, however, the effect was lost ($p > .10$). These results indicate that self-efficacy is not associated with ecologically-correct purchase. Rather, one of the antecedents of self-efficacy accounts for the relationships; additional analyses revealed that agreeableness

caused the relationship. That is, agreeableness was positively associated with self-efficacy ($r = .19$, $p < .01$) and with ecologically-correct purchase ($r = .22$, $p < .01$). As a result, when agreeableness was added the analysis, the relationship between self-efficacy and ecologically-correct purchase is no longer significant. Thus, the relationship between self-efficacy and ecologically-correct purchase was illusory because it results from the association of an antecedent construct (i.e., agreeableness) with the two focal constructs.

Nevertheless, frugality showed to be a consistent predictor of ecologically-correct purchase, resources saving and recycling, because it kept positive relationships with the sustainable consumption measures in both correlation and SEM analyses. So, evidences of illusory prediction of frugality are discarded, as no elemental or compound trait is the true responsible for the relationships between frugality and the sustainable consumption measures.

6   DISCUSSION AND IMPLICATIONS

First of all, it is important to remember that this research has proposed and operationalized a concept of sustainable consumption based on literature review and authoritative definitions of consumer behavior (Engel, Blackwell, & Miniard, 2000; Solomon, 2002). Aiming to broad the understanding of ecologically conscious consumption, which is usually referred as the purchase of environmentally-correct products and services (Fraj & Martinez, 2007; Peattie, 2001; Roberts, 1996), it was elaborated a concept of sustainable consumption that encompasses all the consumption cycle, that is, acquisition, use and disposal. Indeed, in the context of sustainability, all these stages are relevant (Peattie & Collins, 2009).

Sustainable consumption was conceptualized in this research as: "*the search for ecologically-correct products and services, 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 less negative environment impact*".

Using the 3M model of personality as a theoretical framework, this research aimed to investigate the personality trait antecedents of sustainable consumption, which was operationalized as three superficial traits: ecologically-correct purchase, resources saving and recycling. Based on literature review and the 3M model framework, we

hypothesized that sustainable consumption is positively related with conscientiousness, openness to experiences, agreeableness, extraversion, general self-efficacy, altruism and frugality. We also predicted associations between traits in the elemental, compound and situational levels.

Frugality, a situational trait, seems to be consistently useful to predict sustainable consumption, because it is a significant predictor of ecologically-correct purchase, resources saving and recycling. Altruism seems to be a significant predictor only of ecologically-correct purchase, and self-efficacy appears to be useful only to predict resources saving. Contrary to expected, neither altruism nor self-efficacy showed to be good predictors of recycling. Instead, this construct presented only agreeableness (negative relationship) and openness as antecedents.

In the present research, taken into account the mediating effect of frugality, self-efficacy and altruism, three elemental traits, agreeableness, conscientiousness and openness, seem to have a significant direct effect on constructs related to sustainable consumption. Nonetheless, 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 frugality, ecologically-correct purchase, resources saving and recycling.

Based on 3M findings, in order to enhance sustainable consumption, frugality should be encouraged. Frugality seems to be a trait predicted by altruism and conscientiousness. So, persuasive communication aimed to promote sustainable consumption could reinforce the importance of collective actions. Besides, attributes like responsibility and generosity should be reinforced too, and characteristics as consumerism and selfishness should be discouraged.

6.1 Future research and limitations

In the present research, considering the mediating effect of frugality, self-efficacy and altruism, three elemental traits (agreeableness, conscientiousness and openness) seem to have a significant direct effect on constructs related to sustainable consumption. Future studies should deepen the investigations of how conscientiousness, openness, agreeableness and frugality should be employed to influence the practice of sustainable consumption behaviors. Experimental studies could certify the validity of these personality traits in publicity and propaganda pieces, elucidating how they can be useful in the sustainability effort.

About the limitations of the study, the scales used to measure altruism, self-efficacy and sustainable consumption might be improved. Other compound 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 general population. Demographic variables can also be assessed as relevant predictors of sustainable consumption. Also, in order to check prediction validity, a segmentation of the sample studied, based on the relevant psychological traits to explain sustainable consumption, should be employed to verify whether the segments differ in this type of consumption as expected.

REFERENCES

Antonetti, P., & Maklan, S. (2014). Feelings that make a difference: How guilt and pride convince consumers of the effectiveness of sustainable consumption choices. *Journal of Business Ethics*, *124*(1), 117-134.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182.

Bodur, M., & Sarigöllü, E. (2005). Environmental sensitivity in a developing country. *Environment and Behavior*, *37* (4), 487-510.

Bone, S. A., & Mowen, J. C. (2006). Identifying the traits of aggressive and distracted drivers: a hierarchical trait model approach. *Journal of Consumer Behavior*, *5*(5), 454-464.

Borden, R. J., & Francis, J. L. (1978). Who cares about ecology? Personality and sex differences in environmental concern. *Journal of Personality*, *46* (1), 190-203.

Cleveland, M., Kalamas, M., & Laroche, M. (2005). Shades of green: Linking environmental locus of control and pro-environmental behaviors. *Journal of Consumer Marketing*, *22*(4), 198-212.

De Young, R. (2000). Expanding and evaluating motives for environmentally responsible behavior. *Journal of Social Issues*, *56*(3), 509-526.

Ebreo, A., & Vining, J. (2001). How similar are recycling and waste reduction? Future orientation and reasons for reducing waste as

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predictors of self-reported behavior. *Environment and Behavior*, *33*(3), 424-448.

Engel, J. F., Blackwell, R. D., & Miniard, P. W. (2000). *Comportamento do consumidor.* (8a. ed.) Rio de Janeiro: LTC.

Follows, S. B., & Jobber, D. (2000). Environmentally responsible purchase behavior: a test of a consumer model. *European Journal of Marketing*, *34*(5/6), 723-746.

Fraj, E., & Martinez, E. (2006). Influence of personality in ecological consumer behavior. *Journal of Consumer Behavior*, *5*(3), 167-181.

Fraj, E., & Martinez, E. (2007). Ecological consumer behavior: an empirical analysis. *International Journal of Consumer Studies*, *31*(1), 26-33.

Friedman, H. & Schustack, M. (2004). *Teorias da personalidade: da teoria clássica à pesquisa moderna.* São Paulo: Prentice Hall.

Friend, G. (2009). *The truth about green business.* New Jersey: Natural Logic.

Gonçalves-Dias, S. L. F., Teodósio, A. S. S., Carvalho, S. & Silva, H. M. R. (2009). Consciência ambiental: um estudo exploratório sobre suas implicações para o estudo de Administração. *RAE-eletrônica*, *8*(1).

Green Brands Survey (2011). Retrieved from: <http://www.cohnwolfe.com/en/ideas-insights/white-papers/green-brands-survey-2011>.

Harris, E. G., & Lee, J. M. (2004). Illustrating a hierarchical approach for selecting personality traits in personnel decisions: an application of the 3M Model. *Journal of Business and Psychology*, *19*(1), 53-67.

Instituto Akatu (2007). *Como e por que os consumidores brasileiros praticam o consumo consciente?* São Paulo: Instituto Akatu. Retrieved from: <www.akatu.org.br/akatu_acao/publicacoes/perfil-do-consumidor>.

Instituto Akatu (2012). *Rumo à sociedade do bem-estar.* São Paulo: Instituto Akatu. Retrieved from: <www.akatu.org.br/akatu_acao/publicacoes/perfil-do-consumidor>.

Kassarjian, H. H. (1971). Incorporating ecology into marketing strategy: The case of air pollution. *Journal of Marketing*, *35*(3), 61-65.

Kinnear, T. C., Taylor, J. R., & Ahmed, S. A. (1974). Ecologically concerned consumers: Who are they? *Journal of Marketing*, *38*(2), 20-24.

Maloney, M. P., Ward, M. P., & Braucht, N. G. (1975). Psychology in action: a revised scale for the measurement of ecological attitudes and knowledge. *American Psychologist*, 30(7), 787-790.

Makower, J. (2009). *Strategies for the green economy: Opportunities and challenges in the new world of business.* US: Mc Graw Hill.

McCrae, R. R., & Costa, P. T. (1997). Personality trait structure as a human universal. *American Psychologist*, *52*(5), 509-516.

Monteiro, P. R. R., Veiga, R. T, Gosling, M., & Gonçalves, M. A. (2008). Personalidade e consumo ecologicamente consciente. *FACES*, 7(2), 30-49.

Mowen, J. C. (2000). *The 3M Model of Motivation and Personality: Theory and empirical applications to consumer behavior.* Boston: Kluer Academic Publishers.

Mowen, J. C., & Harris, E. G. (2003). The MDPS method of message theme development: A new tool for managers. *Journal of Consumer Marketing*, *20*(12), 1045-1066.

Mowen, J. C., & Voss, K. E. (2008). On building better construct measures: Implications of a general hierarchical model. *Psychology & Marketing*, *25*(6), 485-505.

Mowen, J. C., Longoria, A., & Sallee, A. (2009). Burning and cutting: Identifying the traits of individuals with an enduring propensity to tan and to undergo cosmetic surgery. *Journal of Consumer Behavior*, 8(5), 238-251.

Ottman, J. (1998). *Green marketing: Opportunity for innovation.* New York: BookSurge Publishing.

Ottman, J. (2010). *Green marketing: Opportunity for innovation*. (2nd. ed.). New York: BookSurge Publishing.

Peattie, K. (2001). Towards sustainability: The third age of green marketing. *The Marketing Review*, *2*(2), 129-146.

_____

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Peattie, K., & Collins, A. (2009). Guest editorial: Perspectives on sustainable consumption. *International Journal of Consumer Studies*, *33*(2), 107-112.

Penna, C. G. (1999). *O estado do planeta: Sociedade de consumo e degradação ambiental.* Rio de Janeiro: Record.

Pervin, L. (2003) *The science of personality.* New York: Oxford University Press.

Ramanaiah, N. V., Clumpe, M. A., & Sharpe, P. J. (2000). Personality profiles of environmentally responsible groups. *Psychological Reports*, *87*(1), 176-178.

Roberts, J. A. (1996). Green consumers in the 1990s: Profile and implications for advertising. *Journal of Business Research*, *36*(3), 217-231.

Schultz, P. W. (2000). Empathizing with nature: The effects of perspective taking on concern for environmental issues. *Journal of Social Issues, 56*(3), 391-406.

Sen, A. (2000). *Desenvolvimento como liberdade*. São Paulo: Companhia das Letras.

Shaw, D., & Moraes, C. (2009). Voluntary simplicity: An exploration of market interactions. *International Journal of Consumer Studies*, *33*(2), 215-223.

Solomon, M. R. (2002). *O comportamento do consumidor***:** *Comprando, possuindo e sendo.* (5a ed.). Porto Alegre: Bookman.

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, *56*(3), 407-424.

Stone, G., Barnes, J. H., & Montgomery, C. (1995). ECOSCALE: A scale for the measurement of environmentally responsible consumers. *Psychology & Marketing*, *12* (7), 595-612.

Straughan, R. D., & Roberts, J. A. (1999). Environmental segmentation alternatives: A look at green consumer behavior in the new millennium. *Journal of Consumer Marketing, 6*(6), 558-575.

Thapa, B. (1999). Environmentalism: The relation of environmental attitudes and environmentally responsible behaviors among undergraduate students. *Bulletin of Science, Technology & Society*, *19*(5), 426-438.

Tilikidou, I. (2013). Evolutions in the ecologically conscious consumer behavior in Greece. *EuroMed Journal of Business, 8*(1), 17-35.

Todd, S., & Lawson, R. (2003). Towards an understanding of frugal consumers. *Australasian Marketing Journal*, *11*(3), 8-18.

Veiga, J. E. (2010) *Sustentabilidade: a legitimação de um novo valor*. São Paulo: Editora Senac.

Welsh, C. N., & Herremans, I. M. (1998). Tread softly: adopting environmental management in the start-up phase. *Journal of Organizational Change Management, 11(2),* 145-155.

_____