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Abstract

As the challenges related to climate change and global warming become clearer, the need has arisen for companies not only to adapt their products to the green trend, but also to convince consumers to transform their environmental awareness into a set of green purchase choices. To do so, marketers could benefit from over a decade of research on green behavior drivers. However, consumer behavior scholars have focused on the rational drivers of green consumption behavior, leaving behind the irrational factors that may drive green consumers towards green products. The objective of this thesis is to fill this research gap and explore the irrational drivers of green consumption.

In this paper, it is claimed that irrational motives related to the evolutionary challenges that our ancestors had to solve to survive, can influence the behavior of modern consumers. In particular, it was posited that activating self-protection or family-protection cues in consumers may lead people to choose greener products. A quantitative research was realized through sampling 170 respondents, activating a self-protection, family protection motive or assigning them to a control condition. The respondents were asked about intention to purchase green products, perception of green product effectiveness and extent to which consumers like sustainability characteristics in a product. The collected data helped to test the generated hypothesis by using statistical analysis techniques. An analysis of variance was conducted to test differences in means among the three conditions, and a post-hoc analysis revealed which pairs of means significantly differed.

The results revealed that the appeal of product green characteristics is influenced by the activation of self-protection and family-protection motives. Moreover, self-protection motives were found to be a way to influence perception of green product effectiveness. These results show that irrational motives are valuable to companies and prompt a rethink for marketing management to consider new approaches to advertising and exposition of green products by activating motives of family protection or self-protection.

0. Introduction

"*For 25 years, countless people have stood in front of the United Nations Climate Change conference asking our nations' leaders to stop the emissions. But clearly this has not worked […] So, I will [...] ask the people around the world to realize that our political leaders have failed us, because we are facing an existential threat and there is no time to continue down this road of madness.*"
- Greta Thunberg's speech to UN secretary general António Guterres in Katowice's Climate Change Conference (2-14 December 2018).

This very intense speech by Greta Thunberg does a great job in stating that protection of the environment is far from being a new topic. Indeed, it may be claimed that it started in the early 90's, with an always increasing portion of people started to define themselves "green" or "environmentalists". Nowadays, according to Statista (2014), a percentage between 30 and 40% declare they are environmentalists, depending on the generation.

Given the tremendous growth of the movement with the years, researchers have begun dedicating great attention to the characteristics that pool those people who define themselves as green consumers (Shrum, McCarty & Lowrey, 1995, pp.80-81). Additionally, authors have been putting great effort into defining green behavior and green consumers, starting from the 90s up to the latest years. The debate is still open, and agreement is missing on a) what behaviors define a green consumer, and b) what defines green consumers as a group. In this paper, the author will use the terms "green behavior" and "green consumption" interchangeably in their broadest sense, as they are able to capture a variety of green consumer segments. Indeed, "green" can mean people who are deeply engaged and have strong environmental values (true blue greens) or educated consumers who believe in environmental changes in theory, but not in practice (sprouts), as Ginsberg and Bloom (2004) stated in their work on green segmentation. Also, this paper will use the general term "green consumer", to indicate "a person whose attitudes, values, beliefs and actions reflect a concern for the environment".

Even more interestingly, in the last decade, many authors have become eager to gain a deeper understanding of the green consumption trend. The aspects that have been investigated up until now are various: from the rational drivers (Moser, 2015) such as trust, knowledge and norms (Chen, 2013; Padel and Foster, 2015; Smith and Paladino, 2010) to the emotional drivers of green consumption (Makatouni, 2012; Webster, 1975); from the attitudes, intentions and beliefs of green consumers (Kang et al, 2013; Bodero, 1995; Ha and Janda, 2012; Gershoff and Irwin, 2011; McDonald et al, 2015); to green packaging and in-store practices (Guyader et al, 2016; Rokka and Uusitalo, 2008. One may think that everything about green behavior has been studied and proven in these past years.

However, most of these studies concern rational factors driving green behavior: only a few authors have devoted time to study what role irrational factors play in shaping green consumption, despite the rather old theory that elements or implications of 'irrational choice' also coexist with those of 'rational choice' (Zafirovski, 2013). Indeed, the presumed pioneer of economics as the 'science of rational choice', Wicksteed, explicitly uses the term 'irrational' with respect to economic and other choices in 1910, asserting that "a great part of our conduct is impulsive and a great part unreflecting, and when we reflect, our choice is often irrational" (Wicksteed, 1933 [1910]: 23).
Thus, the question of what role irrationality plays in green behavior is proper but, quite surprisingly, not yet answered in its wholeness.

In this sense, the evolutionary psychology perspective may help scholars to answer this question. Based on the fact that most of consumer scholars fail to recognize that human bodies and minds are products of evolution, the aim of this dissertation is to consider an evolutionary explanation to consumer behavior (Saad, 2017). Particularly, this evolutionary perspective ties with irrationality because it states that humans do not need to know consciously the connections between the proximate triggers of their behavior and the ultimate reasons behind those behaviors, and most of the times they do not understand them (Grieskevicious and Durante, 2015, p. 130). In other words, research

has not yet paid enough attention to the idea that human beings have evolved from their ancestors in order to adapt to some fundamental challenges, and that our brain is still set for solving these challenges, to the point that modern consumers still behave in sometimes irrational ways in order to do so.

In this study, it is claimed that the fundamental motives framework is one of the most interesting theories to apply to consumer behavior from an evolutionary psychology perspective. Indeed, it has the potential to offer many useful insights into the world of green behavior. This framework holds that humans have inherited psychological adaptations for solving a set of specific ancestral social challenges like evading physical harm, avoiding disease, making friends, attaining status, acquiring a mate, keeping that mate, and caring for family (Griskevicious and Kendrik, 2013, pp. 272-273). The fundamental motives framework can be used as a basis for studying almost all human behavior: indeed, most of modern human behavior can be studied in light of the fundamental ancestral challenge that it unconsciously aims at solving (Griskevicious and Durante, 2015).

Despite its rather long history, green behavior has not yet been studied in depth under this light. In fact, the author is not aware of any studies aiming at empirically demonstrating a connection between fundamental motives and green behavior. An outstanding exception is the paper by Griskevicious, Van Der Berg and Tybur (2009), where the authors studied the fundamental motive of maintaining status as the driver of green consumption and found that there is an increase in green choices when status motives are activated.
However, acquiring and maintaining status may not be the only fundamental challenge that green behavior aims at solving. Many other motives may be triggering green consumption; but which ones act as real drivers? This paper aims to test whether there are any other fundamental motives, apart from status, which can be empirically proved to be drivers of green behavior.

In other words, this dissertation's goal is to answer the following research question:

Does the activation of irrational fundamental motives influence preferences towards green products?

In answering this question, this thesis will approach the following sub-questions:

- What is green consumption behavior and who are green consumers?
- What are irrational fundamental motives?
- How do irrational fundamental motives influence green consumption behavior?
- How can managers use knowledge about irrational fundamental motives to increase green purchasing?

In trying to answer the question above, this research will take an experimental approach. Respondents will be randomly allocated to three different scenarios and will be asked a set of questions on some products, some of which green and some of which non-green, as well as some general questions about green product perception. The author will conduct an analysis on quantitative data collected through a survey and will then present the results of this analysis, as well as discussion on the latter.

1. Outline of the paper

This paper includes a complete literature review giving the theoretical framework for the research. The theoretical background will give an overview of the definitions and the different drivers of green behavior. Moreover, literature on evolutionary psychology will be presented, along with some studies which relate the two main topics of this dissertation.

Derived from the literature review, hypotheses will be formulated and empirically studied. The required data for the examination will be collected through a questionnaire and analyzed with SPSS. Thereafter, the results will be presented, interpreted and discussed.

Finally, after pointing out the limitations, this study will be concluded with theoretical and managerial implications and recommendations for further academic research, followed by an appendix where the data presented here will be reported in more detail.

CHAPTER 1 – Definitions & Terminology

1.1. Green behavior

Although an increasing portion of people around the world do like to define themselves as green, the definition of green consumers is not as easy as it seems: indeed, the question of who exactly is defined by this term is still crucial in this field and many scholars have devoted their time to shaping a "green consumer identikit". A similar issue can be individuated in the green behavior field, correlated with the definition of green consumer; that is, the question of terminology that has arisen during these years. Indeed, different authors use different terms to express what "green behavior" means in the field of consumer behavior, both in theory and in practice.

Most of the scholars agree on the notion that "green behavior" translates into a particular set of purchase choices: for instance, Chan (2001) uses the term "green purchasing" to refer to the purchase of environmentally friendly products. In a similar way, Joshi and Rahman (2015) use the term "green purchase behavior" to define the complex of ethical decision-making, socially responsible behavior behind this trend. Also, "green buying behavior" has been used by scholars as a synonym of "green purchasing behavior" (Gupta and Ogten, 2009; Dagher and Itani, 2014). It is worth mentioning that these terms are not the only ones used in the field: readers may also be familiar with some other terms themselves, and they may use them to indicate the same exact concept. Consider, for example, eco-friendly behavior or environmental-friendly behavior: they share the same background meaning and they are widely used in everyday language.

Finding the perfect term for this enormous field is complicated but, at the same time, using all of them together results in a very confused discussion. For instance, the author finds that one of the biggest problems lies in the term "behavior", which may be misleading as there are many different behaviors that the consumer could put in place to define himself as green, as for example becoming vegan or avoid single-use plastic. More importantly, this paper deals with the reasons that lead consumers to choose and

consume green: hence, the terms "purchasing" and "consumption" are quite essential for this research.
Thus, throughout this work, the term "green consumption" and "green purchasing" will be preferred, as the majority of literature links the general term green behavior with the act of purchasing and consuming. Thus, both terms will be used interchangeably throughout this thesis.

1.2. Green Consumer

Another important point is that research in this field has to do with green consumers, i.e. the people who engage in green consumption. However, similarly to green consumption, a question of terminology is brought up by the different terms which are adopted to indicate these people in research. For instance, a big portion of scholars has used the term "green consumer" in their work to indicate a person whose beliefs translates in a certain pattern of consumption, i.e. green; in addition, the term "environmentalist" is referred to a person whose buying behavior is usually driven by concern for environmental issues (Shrum, McCarty & Lowrey, 1995, pp.80-81). Other scholars have made use of the term "ecologically-friendly" as well (e.g. Soler, 1996; Leonidou et al, 2010) to indicate the same type of consumer.
Though there are many other ways to talk about this cluster of consumers, as for green consumption, it is essential to choose which one to use in order to avoid misunderstanding when reading through this paper. The author's opinion is that "green consumer" is the best term to stick to because it is very general and thus, it is able to capture a variety of green consumption segments, including true blue greens, sprouts or greenback greens (Ginsberg and Bloom, 2004) without excluding any particular category in the macro-field.

However, once the terminology issues have been solved, an educated reader could still be confused as to what the best definition of green consumer really is. Thus, a need arises to dedicate some time to find the best possible answer to this question.

As already mentioned, research in environmental-driven behavior isn't new, and neither is the quest for a good definition of green consumers. In the past years, the majority of the authors accepted and used a broad and thus, inaccurate, definition of "green consumer". Studies from that period offered descriptions of the "green consumer" mainly following demographic variables (Shrum, McCarty & Lowrey, 1995, p. 81; Straughan & Roberts, 1999, pp. 558-570). The prototype of the green consumer has been traditionally identified as a young, mid- to high-income, educated, urban woman, skeptical of advertising in general, but especially of media communication and less brand loyal than non-green consumers (ibid. pp.558-570).

More recent studies have shifted from a demographic to a psychographic and behavioral approach for profiling green consumers. Specifically, authors have stressed the importance of defining consumers within a framework of everyday-life habits (Gilg, Barr & Ford, 2005, p.488). Following this line of reasoning, Gilg and colleagues defined "committed environmentalists" as people who consider unity and altruism to be more important than wealth, personal influence and power. Moreover, contrary to previous researches, such group was defined as on average older than non-environmentalists, without significant gender difference. Moreover, according to Akehurst, Afonso and Gonçalves (2012, pp.982-983), the underlying characteristic of an ecologically-friendly consumer orientation has been found to be the tangible positive effect that those consumers seek in their purchasing decisions.

The author of this paper argues that the first definitions of green consumers, which considered demographic variables as the only ones capable of drawing a good "green consumer identikit", are nowadays somehow outdated. Indeed, even if some factors like age and political views may still be a factor of similarity for people engaging in green consumption, it is true that everyday life habits, values and norms are a better fit to define them and group them in the same macro-category of green consumers. In conclusion, the author's definition of green consumer may be summarized in the following sentence: "a person whose attitudes, values, beliefs and actions reflect a concern for the environment".

CHAPTER 2 - Literature Review

2.1. History of Green Consumption Literature

Green consumption has been studied in many of its aspects, and some may even believe that the field has nothing new to be discovered, especially given the numerous authors who have devoted their time to it and the rather long history of the trend. In fact, the aspects that have been investigated up until now are various and deserve a recap, in order to give the reader a framework to better understand the bigger picture behind this study. Thus, this section will go through a portion of relevant literature in the green consumption field concerning the study of its drivers, with the objective of identifying the fundamental discoveries and, at the same time, giving a starting point on which to reflect on the topic to the readers.

Firstly, authors have put effort in understanding and explaining the rational drivers of green purchasing (Moser, 2015, p. 167), as well as the value-action gap in this particular field and the cognitive dissonance deriving from this gap (McDonald et al, 2015): while the rational drivers are described to be willingness to pay and strong personal norms (Moser, 2015, p. 172), a big chunk of literature explains that not all personal norms and interests are respected and, consequently, they are not translated into green purchase (Gershoff and Irwin, 2011, p. 1), leaving the consumer with the unpleasant feeling of their actions being out of line with their espoused beliefs (McDonald et al, 2015, p. 1504); in other words, there is a value-action gap in the behavior of consumers.

Moreover, research has addressed the reasons behind green behavior explained through behavioral theories, such as the theory of reasoned action (TRA) by Ajzen and Fishbein (1980) and the theory of planned behavior (TPB) by Ajzen (1991).
The Theory of Reasoned Action focuses on individuals' motivations as determinants of the probability of engaging in a specific behavior, emphasizing the links between attitudes, subjective norms and behavior (Yu, Segev and Villar, 2017). Many studies

have used the TRA to predict green behavior and found out that the attitudes, intentions and beliefs are strong predictors of different green behaviors such as recycling (Boldero, 1995), buying organic apparel (Kang et al, 2013) or purchasing energy-efficient products (Ha and Janda, 2012).

Perceived Behavioral Control (PBC), or the situation in which a person believes to be high on control over a certain behavior and is therefore more likely to engage in a behavior (Conner and Armitage, 1998), is the most important addition to the earlier theory of Reasoned Action. According to the TPB, people who hold positive attitudes towards green behavior, believe that there is normative support for participating in such behavior, and feel that they can easily engage in this behavior themselves, should have strong intentions to perform green behavior. Indeed, similarly to the TRA, the TPB was used by many scholars to study the determinants of green behavior. An example of its application is the research conducted on all EU countries by Liobikienė, Mandravickaité and Bernatonienė (2016), which has shown that subjective norms have a big influence on green consumption, as well as the interaction between knowledge and confidence in green products.

In addition to that, another cluster of green researchers has concentrated efforts on the ways in which marketers can deviate purchase behavior towards green products. For instance, the studies by Guyader et al (2016) or by Rokka and Uusitalo (2008) are examples of papers focusing on this particular question. While the former argues that retailers can influence consumers' intentions to make green purchases via in-store practices, like "displaying relevant information, orienting consumers inside the store, and offering an eco-friendly product assortment" (Guyader et al, 2016, p. 324), the latter found that green consumers regard specific product attributes - like eco-friendly packaging and labelling - as important discriminant variables when purchasing and therefore, marketers should pay specific attention to it in order to be more convincing in their efforts towards selling green products (Rokka and Uusitalo, 2008, p. 523).

Finally, a review study by Joshi and Rahman (2015) is a good summary of the research conducted aimed at understanding determinants, predictors and attitude-behavior

inconsistencies of green behavior. The study takes into account 53 studies carried out between 2000 and 2015. In particular, the authors have elaborated a list of all variables affecting green purchase intention and actual green purchase behavior by reviewing many empirical studies on the topic. These factors, as the authors call them, have been divided into two main categories: individual factors and situational factors. While situational factors are more related to the products, the brands and the way they are presented to the consumer in the buying situation (ibid, pp. 132-135), individual factors have more to do with the motives behind the purchase of a green product, defined as one which satisfies consumers' needs without damaging the environment and therefore contributes to a more sustainable world (Shamdasami, Chon-Lin and Richmont, 1993). In other words, individual factors have to do with why the individual consumer feels like he should purchase a green product *in principle*, which is the interest of the author of this paper and are therefore reviewed in the summarizing table 1, leaving aside the situational factors for the scope of this study.

Another topic which can be object of discussion and consideration is that most of these factors are rational: indeed, factors such as trust, knowledge, values, personal norms and perception of consequences are learned and developed, with or without the use of critical thinking, during the lifetime of an individual. Some factors, instead, are not rational and have not been considered, even though many authors have argued that choices are seldom rational. For instance, Wicksteed (1933) "identifies 'irrational' choices made under the strong and pervasive influence of habits, impulses, emotions, and related factors seen to prevent or obstruct rational, 'deliberate' choice" (Zafirovski, 2012). He observed that the 'power of habit or impulse to resist the intrusion of deliberate choice' even though 'quantitatively defined', infers that 'at any rate our choice is irrational' (Wicksteed, 1933, pp. 24–25). In this regard, even more recent studies support this theory. For instance, Webster (1975) indicated emotions to be drivers of green consumption; also, Tsakiridou et al. (2008) suggest that habits are one of the biggest obstacles to green purchasing, as people are used to products in sometimes irrational ways and it is hard to change their minds on what products to buy.

The effort put into the study of rational factors is considered crucial in unveiling the different reasons that encourage green consumption; however, this paper is more concerned with the unconscious, irrational factors behind them, such as the fear of being damaged by non-green behavior or the worries in protecting close family.

A summary of the studies in this literature review are summarized in the table below:

Table 1: Overview of studies on Green Behavior

Author + Year	Area of Study	Study Results
Theory of Reasoned Action		
Kang et Al (2013)	TRA applied to organic apparel	Attitueds, intentions, beliefs influence green consumption
Boldero (1995)	TRA applied to recycling	
Ha and Janda (2012)	TRA applied to energy-effiicient product purchase	
Theory of Planned Behavior		
Liobikienė, Mandravickaité and Bernatonienė (2016)	TPB applied to green product purchase in EU	Subjective norms, knowledge, confidence influence green consumption
Rational factors influencing green consumption		
Moser (2015)	Rational drivers of green purchasing	willingness to pay; strong personal norms
Joshi and Rahman (2015)	Determinants, predictors and attitude-behavior inconsistencies of green behavior	Individual and situational factors - review study
White and Simpson (2013) in Joshi and Rahman (2015)	Values and personal norms driving green behavior	Environmental, social and ethical values
Chen (2013)	Trust in green products	beliefs + expectations about environmental performance determine trust in green products
Padel and Foster (2015); Smith and Paladino	Knowledge of risks associated with environmental issues	Knowledge of environmental issues increase green purchasing
Wang et al (2014)	Perception of consequences	Green consumers increase their green purchase behavior if they perceive their actions will make a difference

Irrational factors influencing green consumption		
Makatouni (2002); Young et al (2010)	Emotions driving green behavior	Environmental concern, guilt
Webster (1975)	Habits of green consumers	Habits are difficult to change: one of the biggest obstacles to green purchasing
Deviating consumers towards green purchasing		
Guyader et al (2016)	How to deviate purchase behavior towards green products	In-store displaying, orienting consumers and offering many green products
Rokka and Uusitalo (2008)	Attributes directing purchase towards green products	Labelling, packaging direct consumers towards green products
Value-action gap		
Gershoff and Irwin (2011)	Why do people not choose green?	Consumers' trust that the decisions they make will lead to the green outcomes they desire; role of emotions in green choices; contextual elements in the decision environment; role of salient and desired identities may give consumers reasons not to purchase green products
McDonald et al (2015)	Value-action gap in green flying behavior	Strategies to reduce cognitive dissonance: stop flying, carbon off-setting, reducing flying

2.2. Contribution of this dissertation

In summary, the table above offers a plethora of rational reasons for green behavior, as well as an explanation of the biggest inconsistencies that people reporting themselves as green experience throughout their lives. Also, some studies included in this literature review have to do with unconscious reasons why people may choose to perform or not perform green actions, such as emotions and habits. Finally, some of the work mentioned

in the table offers marketers some useful advice on how to deviate towards green purchase.

However, most of these studies concern rational factors: only two authors among the ones mentioned in Table 1 have devoted time to study what role irrational factors play in shaping green consumption. As mentioned above, this dissertation is concerned with further exploring irrational factors through bringing evolutionary theories to the table. The author agrees with the view that elements of 'irrational choice' also coexist with those of 'rational choice' (Zafirovski, 2012) and are relatively important in the study of green consumption. Thus, the aspiration of this study is to contribute to the discovery of new irrational factors in this field.

Furthermore, most of the work mentioned in Table 1 deals with studying behavior of people who are reporting themselves as green, meaning that these consumers are already rationally tied to the set of values, norms and actions that make up green consumption. This study hopes to contribute to this vast field by taking one step back and understand whether there is some evolutionary challenge that, if activated, could unconsciously incentivize green consumption in all people, regardless of whether they report themselves as green or not, therefore confirming that the fundamental motives framework theory finds application in this field.

Also, this dissertation aims at giving a managerial contribution by helping marketers find new ways to deviate consumers towards more environmentally responsible choices, in addition to the practices that they already use.

2.2. Evolutionary Psychology as a New Perspective

In addition to being a very helpful review of the research status-quo on the matter, the previous section is also a starting point from which to take inspiration for the formulation of new research questions. In fact, as anticipated earlier, most consumer scholars fail to recognize that "all human behavior includes an evolutionary explanation, and evolutionary explanations concern the adaptive function of behavior" (Griskevicious and Durante, 2015, p. 122), i.e. they fail to remember that our bodies and minds are products of evolution and that there must be an evolutionary explanation to green purchase which concerns the adaptive function (Saad, 2017). Indeed, most of the papers are limited to discovering what is the trigger of green purchasing, or how green consumers developed this particular behavior during their life, but they do not go into the question of why it is in their *biology* to behave in such a way: for instance, why would it be in the biology of a consumer to buy coffee pods in a biodegradable packaging, or to buy an electric car? Does he buy those just because he feels good by being "environmentally responsible" or is it because it is in our ancestors' DNA to avoid physical harm, i.e. does he unconsciously buy these products because he wants to avoid the catastrophic consequences of climate change?

In the following section, the field of evolutionary psychology and the theory of fundamental motives framework will be introduced, with the purpose of giving the reader a better focus on the foundation of this study.

2.2.1 Evolutionary Psychology and Green Behavior

Evolutionary psychology is based on Darwin's theory, used as the unifying framework of the life sciences, helping understand the characteristics and behaviors of all living organisms (included humans).

In the context of consumer behavior, the authors that have contributed the most to the exploration of this field are undoubtedly Griskevicious and his colleagues. In fact, in their book, Griskevicious and Durante (2015, pp. 122) explain what the bridge between evolution and consumer research is by incorporating different theories and findings, as well as giving suggestions for ways to use this perspective in any area of study. First,

the authors explain that it is wrongly believed by many that evolutionary perspective relies on a single theory. Instead, natural selection is a meta-theory which comprises different theories, some of which particularly relevant for consumer researchers and for studying green behavior (Grieskevicious and Durante, 2015, pp. 130 to 135) such as:

(a) the mismatch theory, which states that some tendencies adaptive in ancestral environments are maladaptive today (e.g. Nesse and Williams, 1994);

(b) the error management theory, according to which people make errors in adaptive ways (e.g. Haselton and Buss, 2000);

(c) the fundamental motives framework, claiming that people's evolutionary goals change depending on the situation (e.g. Kenrik et al., 2010a).

To exemplify how these theories can be used in the context of consumer behavior, they consider eating behavior of modern consumers and why someone would eat food high in fats and calories, claiming that this behavior is explained by the way humans have evolved in a situation of food scarcity: indeed, people interact with the modern world, where food is abundant, with a brain designed to interact with a food availability constraint.

The authors also state that there are four ways to categorize evolutionary explanations: (1) proximate mechanism: what are the triggers (cause) of the behavior; (2) development: how does the behavior come about during one's lifetime; (3) Adaptive function: what adaptive problems does the behavior ultimately function to solve; (4) Evolutionary history: how did the behavior arise in the species. While (1) and (2) are processes that occur within lifetime of individual; the other two reside within evolutionary biology (ibid, p. 124). Thus, while most of the research on green behavior has been dealing with (1) and (2), this research aims at understanding (3) and (4) through the fundamental motives framework. In other words, through this perspective, one can understand (3) what challenges green behavior aims at solving, among the fundamental ones included in the theory and (4) how green behavior can be activated in modern consumers.

Such an inquiry is interesting for two reasons. First, since scholars are still in the process of understanding why green ideas are not always becoming green purchases, this research hopes to give a direction: it might be that green products do not stimulate the "right" fundamental motive, thus contributing to the low conversion rate of green ideas into actions. Secondly, and consequent to the first reason, it may be of great interest to expand marketers' knowledge of the "primitive" adaptive functions that stimulate green purchases in order to enhance their marketing strategy.

2.2.2. Fundamental Motives Framework

Evolutionary psychology is a field considering different theories and frameworks. Out of all the theories mentioned by scholars, one that deserves attention in the study of consumer behavior is the fundamental motives framework.

According to Griskevicious and Kendrik (2013, pp. 272-273), the fundamental motives framework maintains that humans have inherited psychological adaptations for solving a set of specific ancestral social challenges. These fundamental challenges include: (1) evading physical harm, (2) avoiding disease, (3) making friends, (4) attaining status, (5) acquiring a mate, (6) keeping that mate, and (7) caring for family. History teaches us that humans who were successful in solving these critical challenges enhanced their probability of surviving and could become what are now considered ancestors: because of the important implications that these motives have had for human evolution, they are called "fundamental". Another important point is that a fundamental motive "can be activated or primed by external or internal cues, indicating threats or opportunities related to a specific evolutionary challenge" (Grieskevicious and Kenrik, 2013, pp. 374). For example, the fundamental motive of attaining friends can be activated by an old college sending a happy birthday card, making the person "primed" by said card feel like calling the friend back.

Another fundamental point in the fundamental motives framework is that humans do not need to know consciously the connections between the proximate triggers of their

behavior and the ultimate reasons behind those behaviors, and most of the times they do not understand them; however, according to evolutionary psychology, "the human mind is a complex integrated assembly of psychological adaptations" (Grieskevicious and Durante, 2015, p. 130) and therefore, almost every aspect of consumer behavior concerns evolutionary challenges and how the brain has adapted to them.

The study conducted by Griskevicious, Van Der Bergh and Tybur (2009) is a great example of how the fundamental motives framework relates to green behavior: in fact, the authors have applied some of the different theories of evolutionary psychology to green consumption, and in particular to the choice of purchasing different kinds of green products over equally priced, but more luxurious products. The results of their work hold that activating status motives, i.e. activating the fundamental motive of attaining status with external cues, leads people to choose prosocial and green products over more luxurious but equally priced "normal" products (ibid.). According to the authors, green products can help consumers to signal altruism through the willingness to incur the cost to own and use products that are good for the society, therefore helping improving status through costly signaling (Grafen, 1990).

However, the author's opinion is that status motive may not be the only one to have a connection with green choices. Indeed, some of them may act as drivers of green behavior just as much as status. Contrary to Griskevicious, Van Der Bergh and Tybur's work, this study wants to consider another set of fundamental motives.
Hence, the following list serves to reflect upon which of them may be worth an empirical study.

a) Evading physical harm: with the challenge of limiting global warming to +1.5° degrees as a main goal for humanity in order to avoid catastrophic events in the upcoming years (O. Hoegh-Guldberg et al, 2018), this fundamental motive may be considered as primary in the study of green behavior because of the association with potentially harmful events such as floods, hurricanes, etc. which can physically hurt a person;

b) Caring for family: this motive is believed to have explanatory power for green behavior if associated with family protection instincts; for instance, mothers could become green consumers to protect the environment for their kids and grandkids;
c) Avoiding disease: although it may somehow be related to the avoidance of physical threat, it appears as a "side motive" more than a motive itself in this context because physical threat can turn into a disease, but this could only explain green behavior by an infinitesimal part;
d) Acquiring and keeping a mate: while it may be that greens prefer other greens to reproduce with, the connection seems somehow fragile; the author's opinion on the matter is that it would make more sense to relate this to status motives, i.e. a green person may purchase green to signal status to potential mates;
e) Making friends: it may be that green consumers behave green to appeal to potential friends; however, it is unlikely that wanting a new friend could lead someone to make a green purchase. Thus, the connection between making friends and behaving green does not look solid.

After these considerations, an important characteristic that differentiates this dissertation from previous studies on the matter emerges: safety. The fundamental motive of being safe and keeping significant others safe has not yet been studied in the context of green behavior; nevertheless, it is believed that an empirical study could lead to interesting results that could find applications both for future research and for marketing purposes.

2.2.3. Hypothesis Formulation

Arguably, the fundamental motives framework opens a plethora of new research questions in the field of green behavior.
Out of all the fundamental motives and given that status motives have been proven to be eliciting green responses in people, there are at least two more claimed to be particularly important: evasion of physical threat and caring for family, as already explained in the paragraph above.

The notion that the activation of the self-protection system "attunes people to information suggesting they might be in danger" (Griskevicious and Kendrik, 2015, p. 375) is key in this matter. In fact, the implications of the activation of self-protection cues may be that people could be worried about the threat of catastrophic events associated with climate change, so that they could prefer to seek products and brands associated with environmental safety and environmental trustworthiness. For example, in choosing whether to purchase a toothbrush in plastic versus biodegradable material, a green consumer may choose to purchase a biodegradable material because he is scared of the disastrous impact of plastic on our planet. Insights on how the self-protection system reorients preferences and decision-making regarding green behavior could prove useful for marketing scholars and for marketing practitioners around the world, but these hypothesis has, to the author's knowledge, never been tested.

Another fundamental motive, related to the self-protection motive, which may be able to explain green consumers' behavior is caring for family. For instance, maternal protection instinct may lead moms to choose parabens-free, perfume-free detergents in order to protect the environment for their kids. An example, for instance, is the Danish market for perfume-free body laundry detergents, which has seen exponential growth in the latest years, with the brand "Neutral" reaching the highest portion of market share of more than 20% (Passport, 2018): the evolutionary psychology theory of fundamental motives may be able to find a connection between this green product's success and the fundamental motive of caring for the family. However, similarly to the previous case, this link has never been tested.

In general, the fundamental motive of staying safe or protecting safety of relatives is of great importance in green literature. Indeed, scholars have studied safety as one of the reasons why people buy organic products (Cerjak et al, 2010, p. 280) and have indicated it as one of the factors affecting green consumption (Joshi and Rahman, 2015, p. 136). Also, sometimes the term is used as a synonym for green product: to give two examples, "environmentally safe" is a term used by Brown and Wahlers (1998) as well as by D'Souza et al (2007) to indicate environmentally friendly products and practices. The

use of the term “safe” and its derivatives is common in green consumption literature. It is hence quite bizarre that the link between the ancient, unconscious, fundamental meaning of this word and the behavior of modern consumers remains mysterious.
This paper claims that such a gap in past research prevents the green consumption field from gaining a deeper understanding of the irrational self-protection and the family-protection motives, thus leaving scholars with a lack of insight which could prove very useful for a deeper knowledge of consumer behavior. This work hopes to bring this contribution exactly to further investigate on these motives.

Thus, the aim of this paper is to test the following hypothesis:

Do irrational fundamental motives activation influences preferences towards green products?

Specifically, an experiment will be set up in order to test whether the following hypotheses are true:

H1) Activating a motive for physical harm avoidance influences preferences towards green products, other characteristics equal.

H2) Activating a motive for protection of family influences preferences towards green products, other characteristics equal.

CHAPTER 3 – Methodology & Research Design

3.1. Methodology

For this paper, the author will use a quantitative research method. The choice of this method is justified by two factors: first, quantitative research builds upon existing theories, as Leedy and Ormrod (2001) state, which is exactly congruent with the nature of the topic this paper is exploring. Second, quantitative research responds to the need to answer questions on relationships within measurable variables, with an intention to explain, predict and control a phenomenon (Leedy, 1993). Quantitative research involves the collection of data so that information can be quantified and subjected to statistical treatment in order to support or refute "alternate knowledge claims" (Creswell, 2003, p. 153).

Quantitative research can be of different kinds, i.e. descriptive, experimental and causal comparative (Williams, 2007). From the nature of the research question posed above, it is pretty clear that the research will be causal comparative: as Leedy and Omrod (2001) rightly point out, this quantitative approach gives the researcher the opportunity to examine how the independent variables are affected by the dependent variables and involves cause and effect relationships between the variables. In this study, the consumer's fundamental motives will be the independent variables and the answers to the questions will be the dependent variables, and the cause/effect relationship between these two will be studied in order to see if there is any. To study this, ANOVA will be used, focusing on two or more categories with the independent variables as compared to the dependent variable (Volt, 1999): in this case, the priming variables will be put in relation with the different choices of the participants. As Thurner and Thayer rightly assert in their book "Introduction to Analysis of Variance" (2001, p. 6), ANOVA is the best tool to answer the question: are two (or more) groups of numbers sufficiently different for researchers to believe that they are the result of a particular influence that was operating?

In concrete terms, the study will be conducted through an experiment to answer the two different questions posed above. The sample should be big enough to represent the population: to draw conclusions a reliable large sample size is needed, as in smaller samples the correlation coefficients among variables are less reliable (Pallant, 2005). Therefore, a number of respondents of at least 150 people was pursued.
This research design is an experiment, in which each respondent is allocated to three conditions: one will be the first condition group, one will be the second condition group, and the third will be the control group. The respondents will be randomly assigned to one of the three groups.

3.2. Ontology and Epistemology of Research Design

The difference in reality perception has consequences for the way of thinking and conducting scientific research. Therefore, it is crucial, before starting a research, to reflect upon the different paradigms of research design philosophy. In fact, when being aware of these paradigms on how knowledge about how the reality is perceived, consequences that these views have for conducting scientific research and limitations of paradigms will be clearer. Among others, Guba (1990, p. 17) discusses four different perspectives; positivism, post-positivism, critical theory, and constructivism. To identify the approach of this study, the ontology and epistemology of the research must be clarified. Ontology is the nature of reality, while epistemology can be defined as the relationship between a researcher and the reality (Guba, p. 18).

Ontology can be objective, i.e. the position that social entities exist in reality external to social actors concerned with their existence, or subjective, i.e. social phenomena are created from the perceptions and consequent actions of those social actors concerned with their existence. (Saunders et al, 2009). This research is claimed to have an objective perspective, since evolutionary psychology is concerned with the products of evolution in people's minds and is characterized by a high level of unconsciousness: in other

words, it is assumed that the phenomenon of green consumption is not influenced by one's perceptions and consequent actions but merely on the primitive, unconscious, instinctive responses to a certain event.

For what concerns the epistemology of research, it can be stated that the philosophy of positivism is adopted in this paper, because it concerns working with an observable social reality with the end product as a law-like generalization, which is similar to the philosophical perspective of a natural scientist (Remenyi *et al*. 1998, p. 32). This philosophical idea holds that phenomena that can be observed will lead to the production of credible data based on existing theories, from which hypothesis would be developed. These hypotheses will be tested and confirmed, in whole or in part, or rejected, leading to the further development of theory which then may be tested by further research.

1.2 Experimental Design

In exploratory experiments, the primary objective is to generate information on which to build a hypothesis or look for patterns (Fray, 2014, p. 461). The choice to run an experiment was dictated by the nature of this study, which is exploratory in that its aim is to observe whether it exists a pattern of connection between irrational fundamental motives and green behavior. Also, an experimental design was chosen because of three main advantages:

a) extraneous variables can be controlled, so that the researcher can be confident that the change in the dependent variable is given by the dependent variable;

b) experiments are repeatable and therefore, results can be checked and verified;

c) due to the controlled environment of experimental research, better results are often achieved (Keppel, 1991).

Particularly, this experiment tested whether self-protection or family-protection motives influences preferences for green products over other equally priced non-green products. It also tested whether the same setting influences attitude towards green products in general, as well as whether sustainability characteristics are evaluated more positively

after exposure to fundamental motives.

3.3. Sample

A reliable sample size is needed in order to draw meaningful conclusions: in fact, small samples run the risk of being less reliable (Pallant, 2005). For this reason, a sample of minimum 150 people was required. The final sample size in this paper contains 170 responses. The following tables show the demographic characteristics of the people involved in the study:

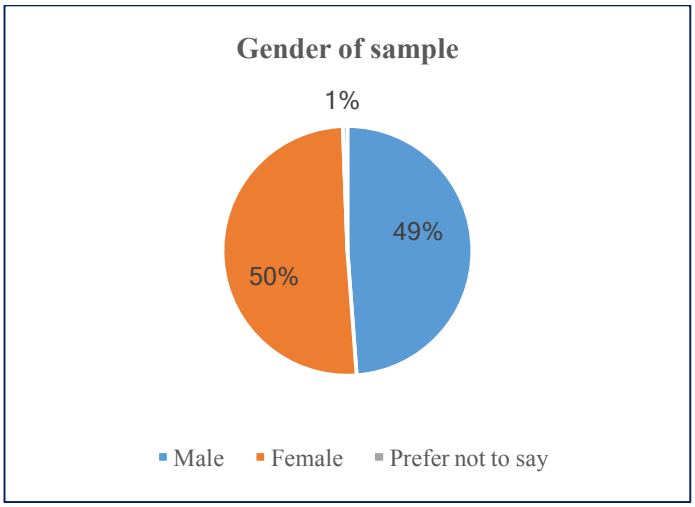

Figure 1: Gender distribution of sample

Figure 1 shows that he sample was composed of an equal number of males and females.

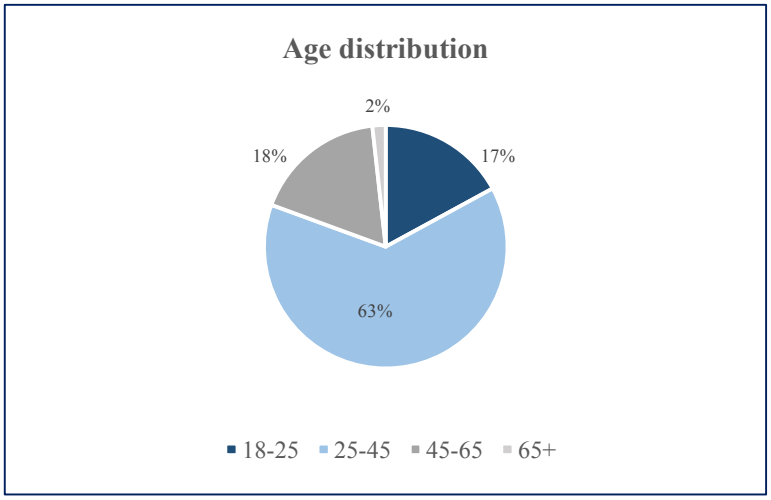

Figure 2: Age distribution of sample

The sample age distribution is skewed towards younger people: indeed, as demonstrated by Figure 2: more than 80% of the respondents were at most 45 years old.

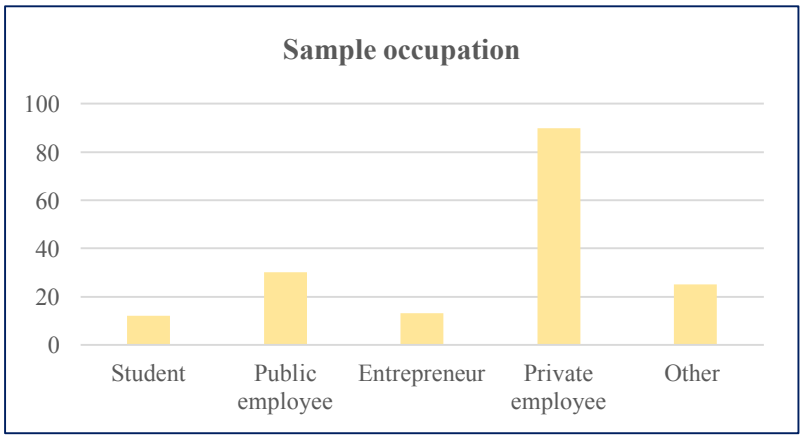

Figure 3: occupation of respondents

As for the occupation of the respondents, Figure 3 shows that they are either private or public employees: a few of them are students or entrepreneurs, and the rest of them do not correspond to any of these categories of employment.

Overall, the sample is pretty heterogeneous, which is a good starting point for the purpose of this dissertation: in fact, in order for the experiment to be significant for the study, it is better that each individual is different, so that the effect of the fundamental motives priming is not biased by any particular demographic characteristic (i.e. being a woman or being young). In other words, it is claimed that this sample is representative of the underlying population, which is composed by a heterogeneous group of adults of different age, sex and occupation and whose attitudes towards green consumption is not needed to be known. In fact, the sample needed to represent the average consumer, regardless of age, sex, education or beliefs.

3.4. Realization of survey

The survey was composed of a set of general questions, a story, a manipulation check question and a set of questions related to six different products and to general thoughts about green products. It was designed with Qualtrics and distributed via Amazon Mechanical Turk, with the relevant covering note to explain the purpose of this study and to assure the participants that all the data collected during the study were kept anonymous and confidential, as well as specifying that they were used for research purposes only.
Three conditions were created and assigned to people: two were the primed groups for the two different motives, while the other one was assigned to the control group. In other words, this was a two between-subjects motive conditions study, with conditions being: 1) self-protection; 2) family and 3) control.

In order to randomize the groups, the first question was about day of birth. If a respondent's day of birth fell between 1st ad 10th day of the month, he would be assigned the first scenario; similarly, if birth day was between 11th and 21st, he would be assigned the second scenario. Finally, if his birth day was between 22nd and 31st, he would be assigned the control condition.

Group 1 and 2. The primed groups read a story of about 400 words: these stories were written with the aim to elicit self-protection motives (scenario 1) or family protection

motives (scenario 2). These stories were identical, except for the parts which explicitly refer to the motives. Moreover, the stories did not directly mention pro-environmental behavior. This was done in order to avoid biases towards the preference for green products over non-green products, which may be connected with having read the story first.

Control group. The control group read a 400-word story which was not connected to self-protection motives but would elicit similar feelings (i.e. sense of familiarity, belonging and aggregation) as the first and second story. The choice of eliciting roughly the same feelings in the cover story was dictated by the need to avoid that the two stories may lead to different outcomes because they gave the reader different emotions and feelings.

To decrease the probability of framing biases related to the priming to happen even further, the group was asked to carry out a second task, i.e. a survey on the importance of physical exercise. Framing bias refers to the fact that human choices are remarkably susceptible to the way options are presented (De Martino et al., 2006). This task was of great importance, as it allowed for manipulation checks; if it was not completed, the risk that the participants would choose their answers based on the stimulus given by the story would be higher. In other words, their response would be framed by the stimuli presented in the story. However, for this experiment to test the evolutionary explanations behind green behavior, the answers should be based on spontaneous reaction, without being influenced by the way the stimulus was presented. For this reason, "distracting" the people involved in the study with a second task makes the research more efficient, as they did not have an immediate remembrance of the information given and thus, their choices had a higher chance of resembling their real choices without framing biases.

3.4.1. Products and questions

The products to be evaluated were of different kinds, in order to give a choice between slightly different pro-environmental benefits without the participants being biased by

particular preferences towards one of them.
Notably and among the many, three characteristics were chosen based on the concept that people tend to prefer green products that can achieve protection or enhancement of the natural environment by conserving energy and/or resources and reducing or eliminating use of toxic agents, pollution, and waste (Ottman et al. 2006, p. 24). Namely, these characteristics were: 1) non-toxicity; 2) packaging; 3) farm-to-fork production.

First, non-toxicity, related to the potential health hazards that everyday exposure of toxic chemicals can lead to, has been found to be one of the most important benefits that consumers seek in household products (Alston and Roberts, 1999). The logical consequence was to test the attribute on a laundry detergent. To further justify this choice, the market trends were examined and the impressive data gathered about the rise in percent market share of brands like Neutral (Passport 2018), which offer a range of perfume-free and PH-neutral laundry detergents, gave an even stronger argument for choosing this product and this characteristic.

Secondly, nowadays' consumers are known to be particularly attentive towards the packaging that they are to buy, both in terms of recyclability and in terms of biodegradability. Indeed, a study by Klaiman, Ortega and Garnache (2016) has found that average estimated willingness to pay for packaging recyclability is the highest for plastic, followed by aluminum, glass, and then carton; the authors also suggest the hypothesis that consumers may be willing to pay the most for plastic packaging recyclability because they view plastic as more hazardous for the environment if not properly recycled or disposed of.
In addition, biodegradability in packaging is a virtuous characteristic which has lately been a focus of researchers (see for example Kainz, 2016). The sector's growth is per se a proof of how consumer demand for biodegradable packaging has tremendous potential: the total global production capacities for bioplastics is expected to rise to 7.8 million tons in 2019 (European Bioplastics, 2016), with the biggest application in the packaging segment.
All the research about packaging preferences mentioned above and the focus on

biodegradability has led the author of this paper to consider these attributes worthy of attention, therefore driving the choice of orange juice in plastic vs biodegradable packaging as a second product to test.

Third, reducing pollution and eating safer products by enabling a sustainable food system is a primary trend. Morath (2016) explains that "the majority of food for home consumption is accessed at retail outlets or restaurants: however, eight out of the top 10 trends for 2014 by the National Restaurant Association [of the United States] are related to sustainable food systems and to measures like locally sourced meats, seafood, locally grown produce, environmental sustainability, hyperlocal resources, healthful kids' meals". Thus, it can be inferred that the purchase of farm-to-fork produce like apples can be preferred to the buying of non-local produce, as for instance avocados, in particular because it means less pollution and safer products.

Laundry detergents and orange juices will have the same brand name as the non-green alternative, meaning that they will be given to the consumer as if they were manufactured by the same company. This action was taken to dissuade participants to make decisions based on preference of one brand over another, either because they already knew one of the two brands or because they instinctively preferred the name/logo/claim of one of the two brands.
In the case of farm-to-fork vs imported, the choice was to keep the brand for the avocado and to exclude brands from apples. This choice was made in order to underline that apples were farm-to-fork products, harvested by local farms who do not have a strong brand; instead, avocados were harvested in large quantities, far from where the grocery store sold them, by a strong multinational brand. This difference was extremized to underline proximity, freshness and quality of farm-to-fork apples over avocados.

For all the pairs of products, the price was the same, in order to avoid that economic reasons (i.e. green products cost more so I cannot afford them) could influence preference for one product over another.
Finally, all the products came with a short description where the main differences

between them were underlined, for the participants to have enough information to make an informed choice. Notably, the positive aspects of green products were given in bold and the negative aspects of non-green products were given in bold.

To summarize, in this study, the products that were rated by respondents were (a) laundry detergents with and without perfume, associated with non-toxicity; (b) food in a carton vs plastic packaging, in particular milk, associated with biodegradability; (c) a local product vs an imported product, i.e. farm-to-fork apples vs avocados, associated with pollution, "freshness" and fair trade.

As a first general question after reading the story and having carried out the cover task, participants were asked whether they usually consider the environmental impact of that kind of product.

Thereafter, the three types of products were presented in random order to counterbalance carry over effects and participants were asked a set of questions about the extent to which they liked the products, in an effort to create a scale for purchase intention. For this purpose, a scale by Spears and Singh (2004) was deployed. The table below shows the questions that participants were asked to answer:

	1 to 7 (1=strongly disagree, 7=strongly agree)
I like the characteristics of this product	
I would buy this product.	
I would recommend this product to others.	

Source: Spears, N., & Singh, S. (2004). Measuring Attitude toward the Brand and Purchase Intentions. Journal of Current Issues & Research in Advertising, 26(2), 53-66.

After having responded to the previous questions related to the specific products, the respondents were redirected to a set of general questions that address their opinions on green products effectiveness.

To get a general understanding of perceived positive influence of green products on the environment, a scale by Chang (2011) was deployed. In particular, the table below shows the questions posed:

"What do you think of green products in general?"

	1 to 7 (1=strongly disagree, 7=strongly agree)
Green products are good for the environment	
Green products cannot help slow the deterioration of the environment.	
Green products can effectively reduce pollution.	
My actions impact on the environment.	

Source: Chang, C. (2011): Feeling Ambivalent About Going Green, In: Journals of Advertising, 40 (4), p.19-32

The second and last group of general questions were instead developed by Schielein (2016) to test the appeal of sustainability initiatives and was re-adapted to test the appeal of different sustainability effects on green consumers. These different sustainability firm initiatives were based on the propositions in literature stating that "most [sustainability] initiatives target the choice phase of consumption by informing consumers about ingredients, production methods, or in-use resource efficiency" (Peattie, 2010, p. 215)."

"On a scale from 1 to 7, please rate the extent to which you find the following sustainable characteristics appealing":

The product was produced saving energy and reducing carbon emissions.	1 to 7 (1=strongly disagree, 7=strongly agree)
The product was produced reducing the use of non-renewable raw materials, using more environmentally friendly materials.	

The product was produced reducing toxicity, for example through using less hazardous chemicals and through efforts to reduce the pollutants in waste water at supplier factories	
The product was produced in an effort to improve the environmental footprint of raw materials and products.	

Source: Schielein (2016), Sustainability initiatives companies should take to encourage customers participate in sustainable behavior. Thesis dissertation – Aston University, Department of Strategic Marketing Management

CHAPTER 4 – Analysis & Presentation of Data

4.1 Analysis and presentation of research results

The purpose of this chapter is to illustrate the different steps taken in analyzing the data collected as a result of carrying out the experiment described in chapter 3.

In particular, the steps taken were the following:

1. A factor analysis was conducted which led to the creation of three constructs, namely intention to purchase, consideration of green products and appeal of sustainable characteristics in a product;
2. A reliability analysis was conducted on each of the constructs, to examine whether the different items of the constructs could be summarized in different variables;
3. ANOVA was performed on the new variables, which were created after the first two steps through the command "Transform – compute variable" on SPSS, with function being the mean of all the different variables which belonged to the same construct.
4. A post-hoc analysis was conducted on the variables which showed significant difference in means in ANOVA: an LSD test was run to obtain more information on what groups means significantly differ.

4.1.2. Factor Analysis

As the survey contained several opinion-based constructs that were based on a multi-item scale, it was of importance to test the validity o these scales by making use of factor analysis.

Therefore, an exploratory factor analysis was used, which aims to reduce and summarize data using a smaller set of factors or components (Pallant, 2005) and to explain the correlations among a set of variables (Malhotra, 2010). An exploratory factor analysis typically can be used to test the validity of a multi-item scale that reflects respondents'

opinions and behavior (Sarstedt & Mooi, 2014), as collected through the questionnaire. To assess whether these three scales indeed are valid scales, a factor analysis was performed on each of them. The Kaiser Mayer Olkin (KMO) and Bartlett test was testing the significance.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,851
Bartlett's Test of Sphericity	Approx. Chi-Square	3619,533
	df	300
	Sig.	,000

Figure 4. KMO and Barlett's Test

Since the KMO measure coming out of the analysis was pretty high with a result of ,851 and given that the Bartlett's test was significant at *p=,000,* meaning all correlations were not equal to 0, the requirements for the factor analysis were fulfilled. Moreover, the analysis of communalities revealed high values for all of them (see Appendix 1), which confirms that all the variables are to be brought on for further analysis, as the percent of variance accounted for in each variable is higher than the normal cut-off variable of 50% (Sarstedt and Mooi, 2014).

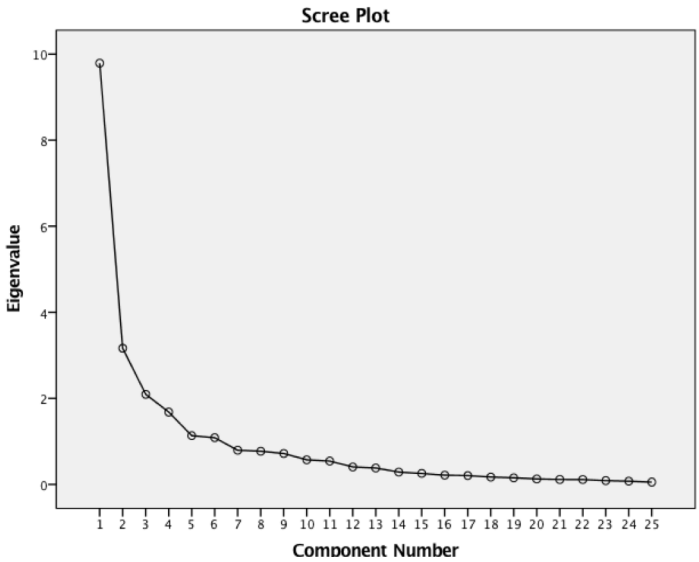

Figure 5: Screeplot – number of components with respective Eigenvalues

As for the number of factors extracted, the Scree plot (in figure 5) and the Eigenvalue in the table variances explained (Appendix 2) show six dimensions.

The analysis was made on all the three constructs together. The first construct (i.e. intention to buy) has six products, each of them with its respective scale. The products were different among each other, in particular with respect to their green characteristics. Therefore, it was expected that the number of factors extracted would be 6, to reflect the diverse nature of the products and consequently, the different intentions to buy. The rotated component matrix for non-green products and green products intention to purchase are reported in Appendix 3, which can be referred to for further details.

For green and non-green product intention to purchase, the same path was found, with each product having high loadings for the questions posed. With the exception of apples and juice in carton, which unexpectedly have high loadings for the same factor, each product formed a construct: each of them was labelled "intention to purchase" + product name, e.g. "intention to purchase juice in carton" or "intention to purchase perfume-free detergents". The same outputs were created with regards to the two general constructs, i.e. consideration of green products and sustainability likeability, with similar results, therefore indicating that each variable did have a meaningful relationship with the underlying factor. The table reporting the rotated component matrix is shown below.

Rotated Component Matrix		
General questions	**Component**	
What do you think of green products in general? On a scale from 1 to 7, rate the extent to which you agree with the following statements. - Green products have a smaller negative impact on the environment.	0,579	
What do you think of green products in general? On a scale from 1 to 7, rate the extent to which you agree with the following statements. - Green products are safer for the environemnt.	0,644	
What do you think of green products in general? On a scale from 1 to 7, rate the extent to which you agree with the following statements. - Green products can effectively reduce pollution.	0,543	
On a scale from 1 to 7, indicate the extent to which you find these characteristics appealing when buying: - The product is produced with a focus on saving energy and reducing carbon emissions.		0,578
On a scale from 1 to 7, indicate the extent to which you find these characteristics appealing when buying: - The product discourages the use of non-renewable raw materials, using more environmentally friendly materials.		0,727
On a scale from 1 to 7, indicate the extent to which you find these characteristics appealing when buying: - The product has low toxicity: it contains less hazardous chemicals and reduces introduction of pollutants in waste water at supplier factories.		0,737
On a scale from 1 to 7, indicate the extent to which you find these characteristics appealing when buying: - The product leaves a small environmental footprint.		0,821

Figure 6: rotated component matrix for general questions

As the table shows, the extent to which green products are perceived as having a positive impact on environment (from 1 to 3) can be considered as a construct and were labelled "green product effectiveness", as the scale by Chang (2013) served to measure. On the other hand, the last four questions all have high factor loadings for the second factor, which implies that they can be merged as a single construct. These four sustainability practices were saving energy and reducing carbon emissions (practice 1), reducing the use of non-renewable materials, using environmentally friendly materials (practice 2), reducing toxicity (practice 3) and improving the environmental footprint (initiative 4). Hence, the extent to which respondents liked these practices in relation to the realization of products makes up a construct, which was labelled "sustainability likeability", as the scales developed by Schielein (2016), based on the literature and summarized by Peattie (2010) and rearranged by the author, was created to examine the extent to which respondents liked sustainability initiatives for production.

4.1.2. Reliability Analysis

To determine whether the intention to purchase the three green products and the intention to purchase the three non-green products could be summarized into two variables, a reliability analysis was needed. As shown below, the reliability statistics showed that Cronbach's Alpha was greater than .8, meaning that these items reliably form the "intention to purchase green products" and "intention to purchase non-green products" scales. Thus, there is no need to delete any of the items.

To understand if intention to purchase could actually be transformed into two dimensions as indicated by the factor analysis, a reliability analysis was conducted as figure 13 shows. The results of the reliability analysis proved that two scales can be formed since Cronbach's Alpha was high in both cases (α = ,888 and α = ,867) and the statistics showed no need to delete any of the items.

Reliability Statistics

Cronbach's Alpha	N of Items
,888	9

Figure 7a – Reliability Analysis for Green Products

Reliability Statistics

Cronbach's Alpha	N of Items
,867	9

Figure 7b – Reliability Analysis for Non-Green Products

The two dimensions could thus be formed and they were called "Intention to purchase green products" and "Intention to purchase non-green products", as the scale developed by Spears and Singh (2004) and readapted for this study served to measure.

The same type of analysis was conducted in the effort to form one construct for the variables "green product effectiveness" and one for "sustainability likeability", with an equally positive outcome for what concerns reliability, as shown from the output below:

Reliability Statistics

Cronbach's Alpha	N of Items
,856	4

Figure 7c – Reliability Analysis for Green Products Effectivness

Reliability Statistics

Cronbach's Alpha	N of Items
,766	3

Figure 7d – Reliability Analysis for Sustainability Likeability

Based on the results, then, the original variables were transformed via SPSS in the new variables listed below, computed using the means of the different variables as the unifying factor:

1.Intention to Purchase Non-Green Products;
2. Intention to Purchase Green Products;
3. Green Products Effectiveness;
4. Sustainability Likeability.

Notably, the first two variables relate to the factor analysis reported in Appendix 3, while the second pair of variables relate to the factor analysis summarized in Figure 8 (p. X). The results of both factor analyses, together with the results of reliability analysis (Figures 7a, 7b, 7c, 7d), have indicated that the multiple questions which composed each of the constructs could reliably be composed into the respective scales.
To give the reader a general understanding of the new variables which he will encounter while reading this dissertation and which will be the basis of the next steps of analysis, a table reporting the descriptive statistics of these 4 variables is presented as a summary:

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NonGreenProducts	170	1,33	7,00	4,9529	1,17145
GreenProducts	170	1,33	7,00	5,5542	,95237
SustainabilityLikeability	170	1,00	7,00	5,2324	1,19093
GreenProductEffectiveness	170	1,00	7,00	5,5333	1,12201
Valid N (listwise)	170				

Figure 10: Descriptive Statistics of Aggregated Variables – Whole Sample

In general, we can observe that the means for non-green products are lower than their green-related questions counterparts. This means that in general, non-green products are less liked, i.e. purchase intention is lower. Furthermore, green products show a smaller variance compared to the rest of the variables. The standard error is the same for all the variables.

4.1.3. Pearson Correlation

The following correlational research served to have a deeper understanding of how and if demographic variables and the four variables that were created as a result of the previous steps taken in the analysis show any significant correlation, and whether there is a strong association among them. The aim of this investigation is to strengthen the argument at the beginning of this research, according to which there should be no correlation between demographics and the results of the questionnaire, because all brains should have the same reaction to an adaptive problem, regardless of demographics.

Correlations

		How old are you?	What is your gender?	What is your occupation?	NonGreenProducts	GreenProducts	Sustainability Likeability	GreenProductEffectiveness
How old are you?	Pearson Correlation	1	,037	,242**	-,156*	,020	-,064	,021
	Sig. (2-tailed)		,632	,001	,042	,792	,405	,784
	N	170	170	170	170	170	170	170
What is your gender?	Pearson Correlation	,037	1	-,041	,125	,012	,180*	-,028
	Sig. (2-tailed)	,632		,595	,105	,874	,019	,718
	N	170	170	170	170	170	170	170
What is your occupation?	Pearson Correlation	,242**	-,041	1	,020	,002	,072	-,095
	Sig. (2-tailed)	,001	,595		,794	,975	,349	,216
	N	170	170	170	170	170	170	170
NonGreenProducts	Pearson Correlation	-,156*	,125	,020	1	,660**	,535**	,342**
	Sig. (2-tailed)	,042	,105	,794		,000	,000	,000
	N	170	170	170	170	170	170	170
GreenProducts	Pearson Correlation	,020	,012	,002	,660**	1	,588**	,624**
	Sig. (2-tailed)	,792	,874	,975	,000		,000	,000
	N	170	170	170	170	170	170	170
SustainabilityLikeability	Pearson Correlation	-,064	,180*	,072	,535**	,588**	1	,450**
	Sig. (2-tailed)	,405	,019	,349	,000	,000		,000
	N	170	170	170	170	170	170	170
GreenProductEffectiveness	Pearson Correlation	,021	-,028	-,095	,342**	,624**	,450**	1
	Sig. (2-tailed)	,784	,718	,216	,000	,000	,000	
	N	170	170	170	170	170	170	170

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 12: Pearson Correlations – Demographics and Created Aggregated Variables

Figure 12 shows that the first and only demographic variable that significantly correlates with green-related variables, in particular with non-green products, is age with a negative correlation of $r = -.156$, $n = 170$, $p < 0.05$. This means that the older the person in the sample was, the least was the intention to buy non-green products. Although interesting, this information alone (i.e., with no other significant correlation between this demographic variable and the rest of the variables) and with this level of significance (sig. = .042) is not deemed interesting enough to proceed with an investigation on the influence of age on the differences of means in the three scenarios.

The other correlated variables are, as expected, the ones that relate to green-related questions. Indeed, they all show positive correlations, most of which are significant. Interestingly, green and non-green products, as well as non-green products and sustainability likeability and non-green products and product effectiveness are positively correlated. Nevertheless, it is worth noticing that sustainability characteristics and green product effectiveness show stronger correlations with green products ($r = .588$ and $r = .624$) as compared to the correlations with non-green products ($r = .535$ and $r = .342$).

To conclude, since no correlational relationships have been proven by the Pearson correlation statistics for demographic variables, none of them was included the following ANOVA.

4.1.4. ANOVA

The experimental nature of this dissertation, which is concerned with the differences in responses of the three groups involved in the design, needs a tool which can help to decide whether there is systematic variation in the data. In other words, the question is: "do the responses to one stimulus tend to be higher (or lower) than the responses to the other, despite the fact that one person may differ from another. ANOVA would be the best tool to answer the question: are two (or more) groups of numbers sufficiently different for researchers to believe that they are the result of a particular influence that was operating? (Thurner and Thayer 2001, p. 6)

Therefore, once all the data was appropriately elaborated through factor analysis, reliability analysis and lastly, simplified for further elaboration, an ANOVA was conducted on the four variables, taking the nominal variable "on which day were you born?" as the discriminating factor for creating the three different groups which differ in the kind of story that they were assigned based on that criterion.

Formally, the hypothesis to be tested were:
H_0 = the mean for intention to purchase is the same for all groups;
H_1 = the mean for intention to purchase is not the same for all groups.

Table 13 represents the results of ANOVA for the first construct (i.e., intention to purchase):

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
NonGreenProducts	Between Groups	1,747	2	,874	,634	,532
	Within Groups	230,172	167	1,378		
	Total	231,920	169			
GreenProducts	Between Groups	2,694	2	1,347	1,494	,227
	Within Groups	150,589	167	,902		
	Total	153,284	169			

Figure 13 –ANOVA output Intention to Purchase, Green vs Non-green Products

In contrast to what was hypothesized, there is no significant difference between the three conditions on the intention to purchase non-green products (F-value = .634, p = ns), neither there is a significant difference on the intention to purchase green products (F-value = 1.494, p = ns). This means that the results do not support hypothesis H_1. It is thus concluded that there is no significant difference among the respondents of these three groups on the intention to purchase green or non-green products.

The general constructs on green product effectiveness and on sustainability likeability were then analyzed, considering the same hypothesis as before, namely:

H_0 = the mean for green product effectiveness and sustainability likeability is the same for all groups;

H_1 = the mean for green product effectiveness and sustainability likeability is not the same for all groups.

The output of ANOVA is presented in Figure 14.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
SustainabilityLikeability	Between Groups	19,481	2	9,740	9,745	,000
	Within Groups	166,924	167	1,000		
	Total	186,405	169			
GreenProductEffectiveness	Between Groups	9,637	2	4,818	3,961	,021
	Within Groups	203,119	167	1,216		
	Total	212,756	169			

Figure 14 –ANOVA output: Sustainability Likeability and Green Product Effectiveness.

In line with what was hypothesized, there is significant difference between the three conditions on sustainability likeability (F-value = 9.745, p = .000). Moreover, there is a significant difference between the three conditions on the green product effectiveness (F-value = 1.494, p = .021). This means that the results do support hypothesis H_1. It is thus concluded that there is a significant difference among the respondents of these three groups on sustainability likeability and green product effectiveness.

4.1.5. Post – Hoc Analysis

Based on these outputs, one can already argue that there appears to be some influence in green preference when exposed to the self-protection and family scenarios, especially when comparing the results to the control scenario. Although not all the variables yielded significant levels of difference, it can safely be claimed that the differences do exist in the general constructs.

However, one big limitation of ANOVA is that it does not indicate which pairs of means actually differ. Do the first and second scenario means differ? Do they both differ from

the third? Are these differences significant? ANOVA alone is not enough to discover the extent to which they are.

To test which pairs of mean differ, a post-hoc analysis was needed. Post hoc tests are designed for situations in which the ANOVA results shows a significant F-test with a factor that consists of three or more means: in this case, additional exploration of the differences among means is needed to provide specific information on which means are significantly different from each other. The original solution to this problem, developed by Fisher, was to explore all possible pair-wise comparisons of means comprising a factor using the equivalent of multiple t-tests.

This procedure was named the Least Significant Difference (LSD) test (Stevens, 1999). The main idea of the LSD is to compute the smallest significant diff erence (i.e., the LSD) between two means as if these means had been the only means to be compared (i.e., with a t test) and to declare significant any diff erence larger than the LSD (Williams and Abdi, 2010). Hence, an LSD test appeared to be a good way to further increase the specificity of the outputs and was run on the two statistically significant variables, with the following results (see Table 15):

Multiple Comparisons					
Dependent Variable	I Condition	J Condition	Mean Difference (I-J)	Std. Error	Sig
SustainabilityLikeability	Self Protection	Family Protection	,52640	,18004	,004*
		Control	,91117	,20971	,000*
	Family Protection	Self Protection	-,52640	,18004	,004*
		Control	,38477	,19286	,048*
	Control	Self Protection	-,91117	,20971	,000*
		Family Protection	-,38477	,19286	,048*
GreenProductEffectiveness	Self Protection	Family Protection	,49799	,19860	,013*
		Control	,55396	,23133	,018*
	Family Protection	Self Protection	-,49799	,19860	,013*
		Control	,05597	,21274	,793
	Control	Self Protection	-,55396	,23133	,018*
		Family Protection	-,05597	,21274	,793

Table 15 –Post-Hoc Analyisis: Sustainability Likeability and Green Product Effectiveness.

The results in table demonstrate that most of the pairs do differ significantly on the mean SustainabilityLikeability and GreenProductEffectiveness. More specifically and very interestingly, it turns out that the participants in the self-protection have a significantly higher average of SustainabilityLikeability and GreenProductEffectiveness than the participants in the family-protection and the control condition. In addition, the family-protection conditions scores sign higher than the control group on SustainabilityLikeability, while there is no difference with control group for the average GreenProductEffectiveness.

Another point to explore is that the mean differences between the first scenario (self-protection, given to people born 1st to 11th) and the control condition differ more than the second scenario and the control condition. In fact, if one looks at the variable "sustainability likeability" and compares differences, the difference between scenario 1 and scenario 3 is bigger, with ,91, while one can see that scenario 2 and scenario 3 differ less, with a value of difference of just ,38. The same applies for the variable "Green product effectiveness": the means of scenario 2 and scenario 3 differ less than the means of scenario 1 and scenario 3, with the former of value ,55 and the latter being just ,055. In particular, the latter is not significant as for the LSD test. Thus, it can be concluded that the first scenario had a bigger effect than the second scenario.

One final note regards the difference between scenario 1 and 2: ,52 in the first variable, ,49 in the second variable. It is important to underline that both are significantly different: therefore, contrary to what was expected, the two scenarios are not compoundable as they yield different means in responses.

4.1.6. Result of hypothesis testing

Hypothesis	Result
H1) Activating a motive for physical harm avoidance influences preferences towards green products, other characteristics equal.	Partly accepted

H2) Activating a motive for protection of family influences preferences towards green products, other characteristics equal.	Partly accepted

CHAPTER 5 – Discussion, Limitations, Theoretical & Managerial Implications

The findings of this study offer useful insight into the irrational evolutionary motives that may drive preferences towards green products, as well as helping to get a better understanding of green consumption by providing an analysis of these drivers. This research unveiled that there is much more to be learned about the topic of green behavior, especially with regard to encouraging people to behave greener. The next paragraphs serve to discuss the most important findings and the key takeaways of this dissertation.

5.1 Discussion

In this paper, two main hypotheses were tested, namely:

a) Activating a motive for physical harm avoidance influences preferences towards green products, other characteristics equal;

b) Activating a motive for protection of family influences preferences towards green products, other characteristics equal.

Based on the results, both hypotheses can be partly accepted. Regarding the first hypothesis, even though intention to purchase green products did not show significantly differences means across the three conditions, the general constructs related to perception of green product effectiveness showed significant differences in means across the scenarios. In particular, the first scenario, i.e. self-protection motives activation, produced significantly higher positive difference compared to the control condition, where no motives were activated. In addition, similar significant differences across scenarios were found for the perception of green product effectiveness.

Hypothesis 2 is partly accepted, as in the case of hypothesis 1: even though intention to purchase green products did not show significantly different mean across the three

scenarios, the general construct on perception of green product effectiveness did. Furthermore, the extent to which people liked sustainability characteristics in a product changed significantly depending on the activation of a family protection motive, with a difference of about half a point from the control condition.

The partial acceptance of these two hypotheses should lead authors to reflect on the effect of activating family-protection and self-protection motives on the perception of green product effectiveness.

The most interesting result obtained on the matter is that one motive is definitely more efficient in influencing the perception that people have of green products, which is indeed self-protection. In other words, the notion that the self-protection system attunes people to information suggesting that they might be in danger ((Griskevicious and Kendrik, 2015, p. 375) has been proven by the change in behavior that affected people who were assigned to the self-protection condition. This means that self-protection motives are a way to influence the extent to which people believe that green products will make a difference in the life of the planet. In other words, again, when feeling under attack, people believe that green products will keep them safer.

On the other hand, the notion that family motives “spurs people to behave in ways to ensure that individuals in need receive proper care and attention” (Griskevicious and Kendrik, 2025, p. 380) is mirrored by the change in behavior that affected people who were assigned to the family-protection condition. It follows that, when family-protection cues are presented, people tend to have more preference for sustainability characteristics, such as non-toxicity or more recycled materials, as they probably feel that these characteristics help their kin receive better care and attention. However, as anticipated in the paragraph above, kin care motives have less impact on perception of green products and their characteristics than self-protection motives. In other words, people show greater preference for green products when they are urged to protect themselves than when they are urged to protect others.

Despite the differences among the two motives, the fact that activation of both did influence the extent to which people trust green products proves that "the human mind

is a complex integrated assembly of psychological adaptations" (Grieskevicious and Durante, 2015, p. 130) which are activated or primed by external cues, indicating threats or opportunities related to a specific evolutionary challenge (Grieskevicious and Kenrik, 2013, pp. 374). In other words, activating safety motives did successfully lead to an irrational quest for safety, which in turn led to see green products as safer, both for self and for family.

A second takeaway is to be found in the differences among the extent to which people liked sustainability characteristics in a product depending on which motive was activated. Indeed, the influence that the two fundamental motives have exerted on these variables was strongly significant. Even more interestingly, the self-protection fundamental motive was able to influence the extent to which people liked green characteristics, and so did the family-protection motive. Thus, it is concluded that the appeal of product green characteristics is influenced by the activation of these fundamental motives: in other words, when people feel under attack or feel that their family is under attack, they like products that keep the environment safe even more than in normal conditions.

Lastly, results show that in general, the averages of intention to purchase were lower for non-green products than for their green-related counterparts. Notably, these averages were based on all three conditions together. Thus, in general, it appears that non-green products tended to be less liked, i.e. purchase intention was lower. Furthermore, intention to purchase green products showed a smaller variance compared to its non-green counterpart. This can indicate there is more agreement on green products, as the answers are all closer to the mean answer. Moreover, the correlations of both sustainability characteristics and green product effectiveness is stronger with green products when compared to the correlations with non-green products. Thus, when one likeed green products better, he/she also liked more their sustainability characteristics and their effectiveness in protecting the environment.

In addition, the findings of our study reveal that intention to purchase green is not influenced by family protection motives, neither by safety motives: none of the three groups related to the three scenarios (self-protection, family protection, control) reported significant difference in behavior. The reasons behind this can be many: one of them is that the products were not described well enough, or that the products did not differ enough for participants to see the differences in environmental-related characteristics in them. Another potential problem was that the products were unrelated and thus, they could have been difficult to compare. For example, it may have been that people liked the perfumed laundry detergent but also liked the perfume-free laundry detergent at the same time. Or they may have really liked orange juice, regardless of the packaging, because the differences among the two packages were not as clear as the author expected them to be. This result is in contrast with what Alston and Roberts (1999) stated on non-toxicity, as well as with what Kainz (2016) and Klaiman, Ortega and Garnache (2016) found in their studies on biodegradability and recyclability of packaging. However, these studies were considering people who reported themselves as green: it follows that the contrast in these results may be explained by the different choices in respondents.

In conclusion, these results show that more than influencing the opinion of a specific product, activating the two motives lead to more attention to the effects of green products on the environment and on the sustainability initiatives that producers take to have less impact on the environment. Moreover, one of the two motives activation has a more significant impact on the way the unconscious of consumers perceives green products in general: self-protection. Thus, these results lead to think that, when feeling under attack, the mind of a modern consumer may be more likely to perceive green claims and green practices as a “safe spot”.

5.2 Limitations of this thesis’s research

One limitation of the current research is that the experiment did not involve the actual purchasing of products. Instead, the current research focused on the context-specific features of psychological adaptations for fear and protection of family. However, it can be argued that the experimental findings are likely to correspond to behavior, since the

set of questions asked for products measured the extent to which the respondents liked them.

A second, yet important limitation concerns the research design. For this thesis, a survey was conducted where consumers were allocated to different priming scenarios. Afterwards, they were asked to indicate how appealing they found a set of green versus non-green products. Finally, they were asked to complete a survey on green product perception and on sustainability initiatives. Even though an experimental setting based on priming and tested through a survey was believed to be the most correct way of investigating the relationship between fundamental motives and green preferences, one of the main limitations concerns the priming. First, the priming scenarios may have elicited different reactions in different people, as what each person perceives is likely to be different. Secondly, one major criticism on priming experiments is that they seldom explain how important priming is in realistic situations: it is indeed difficult to measure how significant priming would be in real life. Also, in the same real-life situation, even a strong priming effect is unlikely to last very long. However, the research helped to give a good prediction of the effects that motives would have on preferences for green products, if activated in some moments, especially because a manipulation check was set up in order to avoid framing biases.

Other than that, the question of whether the sample is representative and hence the results can be extended to the entire population is still relevant. Indeed, the sample is still biased towards private professionals and younger people. So, it can be claimed that the sample isn't representative of the population that it aimed at testing, i.e. the average consumer. There are only few students and public employees in the sample; moreover, the nationality is unknown, meaning that anyone with an Internet connection could answer to the questionnaire, therefore leaving out some cultural characteristics which may or may not have an impact on data collected. Therefore, it cannot be certainly determined whether motives influence preferences towards green products in a general way as some categories are underrepresented.

Lastly and more importantly, it cannot be proved that the fundamental motives

addressed in this paper are stronger drivers of green consumptions than other more rational drivers, as for instance, personal values or education on the matter, as these variables were not measured in the sample. Even though these factors were excluded as they were considered rational and hence, not comparable with the primitive cues that this dissertation was aimed at studying, preference towards green products may well be a mix of rational and irrational cues.

5.2 Theoretical Implications and Recommendations for Further Academic Research

After careful consideration and interpretation of results, it is argued that the findings presented in this dissertation have theoretical implications.

At the very beginning of this work, it was asserted that evolutionary perspective hadn't yet been given enough consideration in the green consumption field, even though it is far from being new, as it started with Darwin's theory. This is because evolutionary theories have historically been confined to biology and natural sciences, so that they have seldom been used to interpret human behavior (Grieskevicious and Durante, 2015). The results obtained from this research show that the application of these theories to interpret consumer behavior can yield significant and interesting results. In other words, these findings about the impact that irrational fundamental motives can have on consumers suggest that the time has come for researchers to expand the use of evolutionary perspective to other fields that relate to human behavior.

In addition, this research is a first attempt at further understanding the irrational drivers of green behavior through evolutionary lenses. Amongst others, Webster (1975), Makatouni (2002) and Young et al (2010) have previously studied irrational drivers of green consumption, but consideration of evolutionary fundamental motives and, more generally, of evolutionary perspective is another angle from where to look at green purchasing research. Thus, this dissertation aims at opening the gate for many avenues of potentially fruitful future research on irrational drivers of human behavior.

Arguably, this study supports the use of evolutionary psychology perspective in consumer behavior and even further, it supports the fundamental motives framework

theory, according to which the fundamental challenges related to evolution are able to explain different human behaviors (Kenrik et al., 2010a; Grieskevicious and Durante, 2015). In this study, the fundamental motives theory was applied, and the results revealed that two different irrational fundamental motives are drivers of greener thoughts among the groups of participants. In fact, activating a self-protection and a family protection motive did influence the perception of green products and initiatives. This finding further supports the evolutionary psychology approach by demonstrating that the mind is a product of evolution and therefore, it responds to stimuli related to evolutionary challenges, even if the human mind does not consciously know that it is responding to any of these stimuli. (Grieskevicious and Kenrik, 2013). Additionally, this study enlarges the understanding of evolutionary irrational motives by demonstrating that activation of self-protection or family-protection cues does elicit an irrational response in modern consumers, who still change behavior according to the ancestral challenges that they must solve in that moment.

Notably, this research was conducted to test how different fundamental motives could influence preferences for green products and practices. The effect of these motives was tested by activating one motive in each respondent by means of priming. However, research has not yet addressed a situation in which many motives are activated by the same stimulus, neither how behavior changes when more than one cue is presented. For instance, a combination of motives may exert a bigger influence on certain behaviors, such as green behavior. Future research can be conducted on the matter, as it deemed of importance to understand how different motives play together, in order to enlarge knowledge of irrational factors behind human behavior and their potential in driving preferences when considered all together. It is expected that the more fundamental cues are activated, the more preference is likely to be driven by irrational responses than by rational reasoning.

Secondly, in this research, the choice was taken to use a quantitative approach as discussed by Leedy (1993) and Creswell (2003, p. 153) to measure the impact of irrational fundamental motives on consumers empirically and draw generalizable

conclusions from the data that were analyzed. However, to capture the true extent to which each person is influenced by different motives and to cope with the heterogeneity of respondents, a combination of quantitative and qualitative research approach should be selected; arguably, neuroscientific method and qualitative response. This approach can help to gather a broad variety of responses of what unconscious reactions the individual respondents can have by measuring them through neural activity, while at the same time engaging with a real person to discuss the impact of these stimuli on their choices.

The advantage of this approach is that the responses would emerge without giving the respondents any direction of potential drivers; therefore, it offers the opportunity to study the exact reaction of each respondent to the different stimuli, which can be empirically measured hereupon.

5.3 Managerial Implications

Safety has traditionally been considered a driver for purchase of products that enhance physical safety, such as airbags in cars or anti-theft devices for houses. The findings of this study further highlight and expand the notion of safety as a driver of purchasing behavior for green products. This thesis' results suggest that activating safety motives may be an effective strategy for promoting pro-environmental consumption behavior. Indeed, while economic or environmental concerns can certainly foster green behavior, the safety aspect of conservation are often ignored. Yet, this study suggests that safety motives such as concern for one's own safety or for one's family safety can be significant in fostering concern for the environment: indeed, self-protection or family-protection can be able to evoke greener thoughts in the minds of consumers, giving them more reasons for behaving green. The results of this study yield that marketers of green products are well-advised to clearly link such products to safety, for instance through exposing consumers to the disasters that they may have to face if they do not consume green, thus activating a motive for self-protection. Also, they might underline the challenges that their progeny would have to face in order to contrast the perils of global

warming, activating a motive for family protection. For example, ads of green product should clearly be able to induce fear of non-green behavior consequences, as well as clearly pointing out the advantages of purchasing green products; for instance, a “safer future” for yourself, relative to the motive for self-protection, and for kids, relative to family protection.
Also, this research suggests that together with these actions, firms should underline the positive effects of consuming green products on the environment, as the combination of safety motives and information on green product effectiveness on the environment may further increase the tendency to think greener, as the findings of this research have demonstrated.

Moreover, findings of previous research suggest that sustainability initiatives taken by firms in the production or distribution of products indeed are valuable and have a significant influence on the extent to which consumers like green products (Peattie, 2010). The empirical research in this dissertation has shown that the use of fundamental motives increases the extent to which sustainability characteristics are liked by consumers. This implies that sustainability should be a key argument in the new marketing campaigns, in addition to the use of safety motives, as consumers tend to like actions taken to reduce the impact of the production process on the environment, especially when they are primed by safety motives. This would lead to even higher likelihood of purchasing green products. Importantly, management should concentrate efforts on linking the right sustainability initiatives to the motives: in fact, there may be initiatives which consumers responding to safety motives like more. For example, reduction of toxic components in a green product may be better linked to the motive of avoiding physical harm than, for instance, reducing distances from the point of production to the point of purchase.

Finally, marketers have long been insisting on the importance of a pro-environmental marketing approach for producers, which is particularly necessary if they want to attract consumers and increase the revenues from eco-friendly products (Kotler, 2011). In this, they may pair up with retailers so to influence consumers' intentions by rewarding their

green purchase decisions (for instance, loyalty programs) and by priming them to look harder for eco-friendly products in the store through promotions, as suggested by Guyader et al (2016). The partnership with retailers is essential because, after being primed by activation of the fundamental motives of self-protection or family protection, the priming should be recalled close to the point of purchase in order to be more effective. For instance, banners and posters could be placed next to green products, reminding the negative effects of non-green purchasing behavior on the environment, so to facilitate unconscious recall of advertising and activation of self-protection or family-protection instincts.

5.4. Conclusions and outlook

This paper started with a quote from Greta Thunberg: "*We are facing an existential threat and there is no time to continue down this road of madness".* There is no doubt that the 16-years-old environmentalist icon is right: the need to change the way we live is urgent, and each of us must do so. In other words, everyone should go green to avoid an existential threat.

The aim of this dissertation was to find a connection between green behavior and the irrational evolutionary motives of family protection and self-protection, so to test whether activating cues which suggest people that they might be in danger can actually foster green consumption behavior. Through this link, the author hopes to provide an answer as to how to encourage every consumer to become a green consumer, since the current practices are still not completely efficient in doing so.

Also, this study had the goal of further exploring the realm of green consumption by adopting an evolutionary perspective and by examining two irrational drivers of green behavior to expand the knowledge of green behavior scholars. In fact, this paper mentioned that only a few authors have devoted time to study what role irrational factors play in shaping green consumption. Particularly, it was claimed that research had not yet paid enough attention to the idea that human beings have evolved from their ancestors in order to adapt to some fundamental challenges, and that the human brain is

still set for solving these challenges, to the point that modern consumers still behave in sometimes irrational ways in order to do so.

To accomplish both goals, an empirical research was conducted to examine the impact of two irrational fundamental motives (i.e., motives for self-protection and family-protection) on green consumption behavior. The results yielded that, in accordance with previous research which confirmed safety as one of the factors affecting green consumption (Joshi and Rahman, 2015, p. 136), the activation of safety-related motives such as self-protection and family protection did lead people to a greater appreciation of sustainability characteristics of products, as well as to a greater confidence in the role of green products in protecting the environment. In other words, this research demonstrated that, when people feel under attack or feel that their family is under attack, their minds are more likely to perceive green claims and green practices to increase their protection and be safer.

These findings served to draw both theoretical and practical conclusions. On one hand, they demonstrated that there is a link between the theory of evolution and human behavior, and that the evolutionary perspective can successfully be applied to green behavior, opening the gate for many other research questions in this field. On the other hand, this study confirmed that there is still room for improvement in how marketing management can drive consumers towards greener behaviors. For instance, they are advised to clearly link green products to safety motives in advertising, as well as to find a way to connect their sustainability policy with safety motives, in order to take advantage of not only the already known rational drivers of green behavior, but also of the irrational part of the consumer's mind.

7. References

Books and Academic Journals

Ajzen, I. (1988). Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior. Journal of Applied Social Psychology, vol 32, pp.665-683.

Ajzen, I. (1991). The theory of planned behavior. Organizational behavior and human decision process, vol 50, pp. 179-211.

Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behaviour. Englewood Cliffs, NJ: Prentice-Hall.

Akehurst, G., Afonso, C., Martins Gonçalves, H. (2012) Re- examining green purchase behaviour and the green consumer profile: new evidences. Management Decision, Vol. 50 Issue: 5, pp.972-988.

Alston, K and J . P . Roberts, J.P. (1999).Partners in New Product Development: SC Johnson and the Alliance for Environmenlal Innovation. Journal of Corporate Environmental Strategy 6, no, 2: 111-28.

Boldero, J. (1995), "The prediction of household recycling of newspapers – the role of attitudes, intentions, and situational factors", Journal of Applied Social Psychology, Vol. 25 No. 5, pp. 440-462.

Brown, J.D. and Wahlers, R.G. (1998). The Environmentally Concerned Consumer: An Exploratory Study. Journal of Marketing Theory and Practice, Vol 6, Issue 2.
Cerjak, M., Mesić, Ž., Kopić, M., Kovačić, D., & Markovina, J. (2010). What motivates consumers to buy organic food: Comparison of Croatia, Bosnia Herzegovina, and Slovenia. Journal of Food Products Marketing, 16(3), 278-292.

Chan, R. Y. (2001). Determinants of Chinese consumers' green purchase behavior. Psychology & Marketing, vol 18, pp. 389-413.
Chang, C. (2011): Feeling Ambivalent About Going Green, In: Journals of Advertising, 40 (4), p.19-32
Conner, M. & Armitage, C.J. (1998). Extending the Theory of Planned Behaviour: A review and Avenues for Further Research, Journal of Applied Social Psychology, 28, pp 1429-1464.

Creswell, J. (2003). Research design: Qualitative, quantitative and mixed methods approaches (2nd ed.). Thousand Oaks, CA: SAGE Publications.

D'Souza, C., Taghian, M. and Khosla, R. (2007). Examination of environmental beliefs and its impact on the influence of price, quality and demographic characteristics with respect to green purchase intention. Journal of Targeting, Measurement and Analysis for Marketing, Volume 15, Issue 2, pp 69–78

Dagher, G. K. and Itani, O. (2014). Factors influencing green purchasing behaviour: Empirical evidence from the Lebanese consumers. Journal of Consumer Behavior, vol 13, pp. 188–195

De Martino, B., Kumaran, D., Seymour, B., & Dolan, R. J. (2006). Frames, biases, and rational decision-making in the human brain. Science (New York, N.Y.), 313(5787), 684–687. doi:10.1126/science.1128356

Fry, D. (2014). Teaching Experimental Design. ILAR Journal, 55(3), 457-471.

Gershoff, A. D., and Irwin, J. R. (2011) Why not Choose Green? Consumer Decision Making for Environmentally Friendly Products. The Oxford Handbook of Business and the Natural Environment.

Gilg, A., Barr, S. and Ford, N. (2005) Green consumption or sustainable lifestyles? Identifying the sustainable consumer. Futures, 37 (6). pp. 481-504.

Ginsberg, J. M., & Bloom, P. N. (2004). Choosing the right green marketing strategy. MIT Sloan Management Review, 79–84, Fall.

Grafen, A. (1990). Biological signals as handicaps. Journal of Theoretical Biology, 144, 517–546.

Griskevicius, V. and Kenrik, D. T. (2013). Fundamental motives: How evolutionary needs influence consumer behavior. Journal of Consumer Psychology, vol 23, pp. 372–386

Griskevicius, V., and Durante, K. M. (2015). Evolution and consumer behavior. In The Cambridge Handbook of Consumer Psychology (pp. 122-151). Cambridge University Press. https://doi.org/10.1017/CBO9781107706552.005

Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010). Going green to be seen: Status, reputation, and conspicuous conservation. Journal of Personality and Social Psychology, 98, 392–404.

Gupta, S. and Ogden, D. T. (2009). To buy or not to buy? A social dilemma perspective on green buying. Journal of Consumer Marketing, vol 26, pp. 376–391.

Guyader, H., Ottosson, M., and Witell, L. (2016). You can't buy what you can't see: Retailer practices to increase the green premium. Journal of Retailing and Consumer Services, vol 34, p. 319-325.

Ha, H.Y. and Janda, S. (2012), "Predicting consumer intentions to purchase energy efficient products", Journal of Consumer Marketing, Vol. 29 No. 7, pp. 461-469.

Haselton, M. & Buss, D. (2009). Error management theory and the evolution of misbeliefs. The Behavioral and brain sciences. 32. 522- 10.1017/S0140525X09991440.

Hoegh-Guldberg, D. Jacob, M. Taylor, M. Bindi, S. Brown, I. Camilloni, A. Diedhiou, R. Djalante, K. Ebi, F. Engelbrecht, J. Guiot, Y. Hijioka, S. Mehrotra, A. Payne, S. I. Seneviratne, A. Thomas, R. Warren, G. Zhou, 2018, Impacts of 1.5ºC global warming on natural and human systems. In: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)]. In Press.

Joshi, Y. and Rahman, Z. (2015). Factors Affecting Green Purchase Behaviour and Future Research Directions. International Strategic Management Review, vol 3, p, 128–143

Kainz, U. (2016) Consumers' Willingness to Pay for Durable Biobased Plastic Products: Findings from an Experimental Auction. Doctoral dissertation, Munich

Kang, J., Liu, C. and Kim, S.H. (2013), "Environmentally sustainable textile and apparel consumption: the role of consumer knowledge, perceived consumer effectiveness and perceived personal relevance", International Journal of Consumer Studies, Vol. 37 No. 4, pp. 442-452.

Kenrick, D.T., Griskevicious, V., Neuberg, S. L., & Schaller, M. (2010a). Renovating the pyramid of needs contemporary extensions built upon ancient foundations. Perspectives on Psychological Science, 5, 292-314.

Keppel, G. (1991). Design and analysis: A researcher's handbook . Prentice-Hall, Inc.

Klaiman, K., Ortega, D. L., & Garnache, C. (2016). Consumer preferences and demand for packaging material and recyclability. Resources, Conservation and Recycling, 115, 1-8. DOI: 10.1016/j.resconrec.2016.08.021

Kotler, P., 2011. Reinventing marketing to manage the environmental imperative. J. Mark. 75 (4), 132–135.

L. J. Williams and H. Abdi. Fisher's least significant difference (LSD) test. Encyclopedia of Research Design, 2010.

Laroche, M., Bergeron, J. And Barbaro-Forleo, G. (2001).Targeting consumers who are willing to pay more for environmentally friendly products. Journal Of Consumer Marketing, Vol. 18 No. 6, pp. 503-520.

Lee, L., Amir, O., Ariely, D (2009). In Search of Homo Economicus: Cognitive Noise

and the Role of Emotion in Preference Consistency. Journal Of Consumer Research, Inc., Vol. 36.

Leedy, P. & Ormrod, J. (2001). Practical research: Planning and design (7th ed.). Upper Saddle River, NJ: Merrill Prentice Hall. Thousand Oaks: SAGE Publications.

Leonidas C. Leonidou , Constantinos N. Leonidou & Olga Kvasova (2010) Antecedents and outcomes of consumer environmentally friendly attitudes and behaviour, Journal of Marketing Management, 26:13-14, 1319-1344, DOI: 10.1080/0267257X.2010.523710

Liovibikiené, G., Mandravickaité, J., Bernatonienė J. (2016). Theory of planned behavior approach to understand the green purchasing behavior in the EU: A cross-cultural study. Journal of Ecological Economics, vol 125, pp. 38-46

Liu, Y., Segev, S. Villar, M. E. (2017) "Comparing two mechanisms for green consumption: cognitive-affect behavior vs theory of reasoned action", Journal of Consumer Marketing, Vol. 34 Issue: 5, pp.442-454, https://doi.org/10.1108/ JCM-01-2016-1688

Makatouni, A. (2002). What motivates consumers to buy organic food in the UK?: Results from a qualitative study. British Food Journal, 104(3/4/5), 345-352.

Malhotra, Naresh K. (2010): Marketing research. An applied orientation. 6th ed. Boston, New York: Pearson.

McDonald, S., Oates, C. J., Thyne, M., Timmis, A. J. & Carlile, C. (2015) Flying in the face of environmental concern: why green consumers continue to fly. Journal of Marketing Management, vol. 31, issue 13-14.

Morath, S. (2016). From Farm to Fork : Perspectives on Growing Sustainable Food Systems in the Twenty-First Century. University Of Akron Press.

Moser, A. K. (2015) Thinking green, buying green? Drivers of pro-environmental purchasing behavior. Journal of Consumer Marketing, Vol. 32 Issue: 3, pp.167-175. Retrieved from https://doi.org/10.1108/JCM-10-2014-1179

Nesse R. M., Williams G. C. (1994). Why We Get Sick? The New Science of Darwinian Medicine. New York: Time Books.

O'Neill, R. M. and Lambert. D. R. (2001). The Emotional Side of Price. Journal of Psychology and Marketing, vol 18, pp. 217-237

Ottman, J.A., Stafford, E. R., and Hartman, C. L. (2006). Avoiding Green Marketing Myopia: Ways to Improve Consumer Appeal for Environmentally Preferable Products. Journal of Environment: Science and Policy for Sustainable Development, 48:5, 22-36, DOI: 10.3200/ENVT.48.5.22-36

Padel, S., & Foster, C. (2005). Exploring the gap between attitudes and behaviour: Understanding why consumers buy or do not buy organic food. British food journal,

107(8), 606-625.

Pallant, J. (2005). SPSS Survival Manual, 2. edition, Open University Press

Peattie, K. (2010): Green Consumption: Behavior and Norms. In: Annual Review Environmental Resources, 35 (1), p. 195–228.

Remenyi, D., Williams, B., Money, A. and Swartz, E. (1998). Doing Research in Business and Management: An Introduction to Process and Method. London: Sage.

Rokka, J. And Uusitalo, L. (2008). Preference for green packaging in consumer product choices – Do consumers care?. International Journal of Consumer Studies, vol 32, pp. 516–525

Saad, G. (2017). On the Method of Evolutionary Psychology and Its Applicability to Consumer Research. Journal of Marketing Research, vol. LIV (June 2017), 464–477 DOI: 10.1509/jmr.14.0645
Sarstedt, Marko; Mooi, Erik (2014): A concise guide to market research. The process, data, and methods using IBM SPSS statistics. Second edition (Springer texts in business and economics).

Saunders, M., Lewis, P, and Thornhill, A. (2009). Research Methods for Business Students. 5th edition. Pearson Education LTD.

Schielein, J. (2016). Sustainability initiatives companies should take to encourage customers participate in sustainable behavior. Thesis dissertation – Aston University, Department of Strategic Marketing Management.

Shamdasani, P., Chon-Lin G. O., and Richmond D. (1993).Exploring Green Consumers in an Oriental Culture: Role of Personal and Marketing Mix Factors. Advances in Consumer Research Volume 20, eds. Leigh McAlister and Michael L. Rothschild, Provo, UT: Association for Consumer Research, Pages: 488-493.

Shrum, L. J., McCarty, J. and Lowrey, T. (1995). Buyer Characteristics of the Green Consumer and their Implications for Advertising Strategy. Journal of Advertising, vol 24, pp. 80-81.

Smith, S., & Paladino, A. (2010). Eating clean and green? Investigating consumer motivations towards the purchase of organic food. Australasian Marketing Journal, 18(2), 93-104.

Solér, C. (1996). Ecologically friendly buying — Theoretical implications of a phenomenological perspective. Scandinavian Journal of Management, Vol 12, issue 3, pp. 275-289

Spears, N., & Singh, S. (2004). Measuring Attitude toward the Brand and Purchase Intentions. Journal of Current Issues & Research in Advertising, 26(2), 53-66.

Stevens, J. P. (1999) Intermediate statistics: A modern approach (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

Straughan, R. D., Roberts, J. A. (1999) Environmental segmentation alternatives: a look at green consumer behavior in the new millennium. Journal of Consumer Marketing, Vol. 16 Issue: 6, pp.558-575

Tsakiridou, E., Boutsouki, C., Zotos, Y., & Mattas, K. (2008). Attitudes and behaviour towards organic products: an exploratory study. International Journal of Retail & Distribution Management, 36(2), 158-175.

Turner, R. J., Thayer, J. (2001). Introduction to Analysis of Variance: Design, Analyis & Interpretation. SAGE Publications.

U. Kainz (2016). Consumers' Willingness to Pay for Durable Biobased Plastic Products: Findings from an Experimental Auction

Volt, W. (1999). Dictionary of statistics and methodology: A nontechnical guide for the social sciences (2nd ed.). Thousand Oaks, CA: SAGE Publications.

Webster Jr, F. E. (1975). Determining the characteristics of the socially conscious consumer. Journal of consumer research, 188-196.

White, K. and Simpson, B. (2013). When do (and don't) normative appeals influence sustinable consumer behaviors? Journal of Marketing, Volume 77, pp 78–95 © 2013, American Marketing Association ISSN: 0022-2429 (print), 1547-7185 (electronic).

Wicksteed P (1933 [1910]) The Common Sense of Political Economy. London: Routledge and Kegan Paul.

Williams, C. (2007). Research Methods. Journal of Business & Economic Research, vol. 5, issue 3, pp. 65-72.

Young, W., Hwang, K., McDonald, S., & Oates, C. J. (2010). Sustainable consumption: green consumer behaviour when purchasing products. Sustainable Development, 18(1), 20-31.

Zafirovski, M. (2013). Beneath rational choice: Elements of 'irrational choice theory'. Current Sociology, 61(1), 3-21.

Newspaper Articles

Anderson, M. (2018). For Earth Day, here's how Americans view environmental issues. Pew Research Center, retrieved from http://www.pewresearch.org/fact-tank/2017/04/20/for-earth-day-heres-how-americans-view-environmental-issues/

Sutter, J. and Davidson, L. (2018). "Teen tells climate negotiators they aren't mature enough". CNN, 17th December. Retrieved from https://edition.cnn.com/2018/12/16/world/greta-thunberg-cop24/index.html

Watts, J. (2018). "We have 12 years to limit climate change catastrophe, warns UN". The Guardian, 8th October. Retrieved from https://www.theguardian.com/environment/2018/oct/08/global-warming-must-not-exceed-15c-warns-landmark-un-report

Websites

European Bioplastics (2016). **Factsheet**. Retrieved from http://docs.european-bioplastics.org/2016/publications/fs/EUBP_fs_packaging.pdf, accessed March 10th, 2019.

Passport (2018). Industry data on laundry detergents in Denmark. Retrieved from http://www.portal.euromonitor.com.esc-web.lib.cbs.dk/portal/analysis/tab

Statista (2014). Percentage of Americans describing themselves as environmentalists, sorted by generation Retrieved from https://www.statista.com/statistics/319145/percentage-of-environmentalist-americans-by-generation/

8. Appendix

Appendix 1 – Table of communalities

Communalities		
	Initial	Extraction
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this product	1	0,838
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would recommend this product to others	1	0,834
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself	1	0,847
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this product	1	0,789
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would recommend this product to others	1	0,698
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself	1	0,692
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this product	1	0,865
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would recommend this product to others	1	0,915
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself	1	0,892
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this product	1	0,797

On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would recommend this product to others	1	0,796
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself	1	0,856
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this product	1	0,796
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would recommend this product to others	1	0,811
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself	1	0,817
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this product	1	0,736
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would recommend this product to others	1	0,611
On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself	1	0,69
What do you think of green products in general? On a scale from 1 to 7, rate the extent to which you agree with the following statements. - Green products have a smaller negative impact on the environment.	1	0,491
What do you think of green products in general? On a scale from 1 to 7, rate the extent to which you agree with the following statements. - Green products are safer for the environemnt.	1	0,68
What do you think of green products in general? On a scale from 1 to 7, rate the extent to which you agree with the following statements. - Green products can effectively reduce pollution.	1	0,618
On a scale from 1 to 7, indicate the extent to which you find these characteristics appealing when buying: - The product is produced with a focus on saving energy and reducing carbon emissions.	1	0,731
On a scale from 1 to 7, indicate the extent to which you find these characteristics appealing when buying: - The product discourages the use of non-renewable raw materials, using more environmentally friendly materials.	1	0,695

On a scale from 1 to 7, indicate the extent to which you find these characteristics appealing when buying: - The product has low toxicity: it contains less hazardous chemicals and reduces introduction of pollutants in waste water at supplier factories.	1	0,711
On a scale from 1 to 7, indicate the extent to which you find these characteristics appealing when buying: - The product leaves a small environmental footprint.	1	0,746
Extraction Method: Principal Component Analysis.		

Appendix 2 – Total Variance Explained Table

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative	Total	% of Varianc	Cumulative %
1	9,79	39,16	39,16	9,79	39,16	39,16	4,143	16,573	16,573
2	3,165	12,662	51,822	3,165	12,662	51,822	3,417	13,668	30,241
3	2,094	8,378	60,2	2,094	8,378	60,2	3,318	13,273	43,513
4	1,681	6,726	66,926	1,681	6,726	66,926	2,958	11,832	55,346
5	1,134	4,536	71,462	1,134	4,536	71,462	2,625	10,501	65,847
6	1,087	4,35	75,812	1,087	4,35	75,812	2,491	9,965	75,812
7	0,794	3,176	78,987						
8	0,771	3,084	82,071						
9	0,719	2,874	84,946						
10	0,571	2,285	87,231						
11	0,543	2,172	89,403						
12	0,406	1,624	91,027						
13	0,381	1,524	92,551						
14	0,287	1,149	93,701						
15	0,255	1,019	94,72						
16	0,215	0,859	95,58						
17	0,206	0,823	96,403						
18	0,172	0,687	97,09						
19	0,154	0,617	97,706						
20	0,126	0,505	98,212						
21	0,115	0,46	98,672						
22	0,114	0,456	99,128						
23	0,088	0,353	99,481						
24	0,075	0,301	99,782						
25	0,055	0,218	100						
Extraction Method: Principal Component Analysis.									

Appendix 3: Factor Analysis for Non-Green Products Intention to Purchase

Rotated Component Matrix

Product		Component					
		1	2	3	4	5	6
Detergent with perfume	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this					0,806	
	to which you agree with the following statements: - I would recommend this product to others					0,794	
	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself					0,873	
Avocado	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this				0,854		
	to which you agree with the following statements: - I would recommend this product to others				0,901		
	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself				0,908		
Juice in plastic	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this		0,83				
	to which you agree with the following statements: - I would recommend this product to others		0,795				
	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself		0,885				

Appendix 4: Factor Analysis for Green Products Intention to Purchase

Rotated Component Matrix							
Product		Component					
		1	2	3	4	5	6
Juice in carton	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this product	0,714					
Juice in carton	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would recommend this product to others	0,468			0,395		
Juice in carton	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself	0,427			0,329		
Perfume-free detergent	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this product						0,795
Perfume-free detergent	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would recommend this product to others					0,316	0,744
Perfume-free detergent	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself						0,872
Apples	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I like the characteristics of this product	0,777					
Apples	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would recommend this product to others	0,625		0,363			
Apples	On a scale from 1 to 7, please rate the extent to which you agree with the following statements: - I would buy this product myself	0,746					

Appendix 5: Survey

Q1
Hi, My name is Giulia and I am a master student at Copenhagen Business School in Brand and Communications Management.

I am currently writing my master thesis about evolutionary psychology and green consumer behavior . It would be of great help if you could please fill out this survey. It will take you no longer than 10 minutes to complete it!

Please note that all answers will be treated confidentially and will only be used for the scope of the study.

Thank you very much in advance for your highly appreciated contribution. :)

Page Break

Q2 On which day were you born?

- ○ From 1st to 11th (1)
- ○ From 11th to 21st (2)
- ○ From 21st to 31st (3)

Q44 How old are you?

- ○ 18-25 (1)
- ○ 25-45 (2)
- ○ 45-65 (3)
- ○ 65+ (4)

Q45 What is your gender?

- ○ Male (1)
- ○ Female (2)
- ○ Prefer not to say (5)

Q46 What is your occupation?

- ○ Student (1)
- ○ Public employee (2)
- ○ Entrepreneur (3)
- ○ Private employee (4)
- ○ Other (5)

Page Break

Q3
In the next screen, you are going to read a story. Please read the story carefully, and imagine yourself as the main character.

You will be asked about the story later, so try to remember it as much as you can.

Page Break

If On which day were you born? = From 1st to 11th

Imagine that you are a young graduate and, while working towards your masters' degree, you decided to work at a sandwich shop in the town where you are studying. Right next to that shop, a shady guy with a threatening face sets up a spot every day. Soon, it becomes obvious to you that this guy is selling drugs. People would stop by to see him and when the bathroom is cleaned, you find needles there. One day, he steals your tip jar money. The manager is not pleased: he tells you if he comes in, to tell him to leave and that he is not allowed in anymore. However, you are worried that you are the one that has to tell him to not come in. He comes in: you are obliged to tell him he is not welcome anymore. He curses you out, saying that he will take revenge

for that, and then leaves.
About an hour later, you go out for a break. He stands up, approaches you, shows you a knife, points at you and says ”you’re gonna die tonight, you did something unforgivable!”. His voice is very serious and the tone is very firm and determined, you run back into the shop to protect yourself.You call the cops: they manage to make him leave the area, but they do not arrest him. You are scared about this: he has a knife and he promised he’d kill you.
Moreover, that night, you have to close the shop at the end of the shift at 9 p.m. It is dark outside and no one is around. You do not own a car and have to walk through an empty town to the bus!
When the bus approaches, you hear steps coming. You turn around, but luckily it is just another student. The door shuts, but you still have to get home and you are not sure: maybe the guy knows where you live?

If On which day were you born? = From 11th to 21st

Imagine that you are a recently married entrepreneur. You have opened a sandwich shop in your town together with your spouse. Right next to that shop, a shady guy with a threatening face sets up a spot every day. Soon, it becomes obvious to you that this guy is selling drugs. People would stop by to see him and when the bathroom is cleaned, you to find needles there. One day, he steals your employee’s tip jar money: you have a reason to not let him in anymore. He comes in, you say he is not welcome anymore, saying that he will take revenge for that, and then leaves.
About an hour later, you go out for a break. He stands up, approaches you, shows you a knife, points at you and says ”you all gonna die tonight, you did something unforgivable!”. His voice is very serious, and the tone is very firm and determined, you run back into the shop to protect yourself.
You start getting worried: he knows your spouse usually brings your 3-months-old daughter to the shop. You call the cops: they manage to make him leave the area, but they do not arrest him. You are scared about this: he has a knife and he promised he’d kill you and your family.
Moreover, that night, you have to close the shop at the end of the shift at 9 p.m. and you cannot leave with your spouse and daughter, which usually go home earlier, around 6 p.m. You do not own a car, and they have to walk to the bus, but you do not want them to walk alone: it’s already dark and there’s not a lot of people around. They leave for the bus stop, but you are very worried: maybe the guy knows where you and your family live? Should you close the shop earlier and go home with them?

If On which day were you born? = From 21st to 31st

Imagine that you are part of a large group of high-school friends
and, when Christmas comes, it is tradition to reunite all together. You are 55, you have

been friends with this group for years after high school and when you reunite for Christmas, it is usually you who host the party. You always invite your friends and their spouses.
It is now December 15th and you go to the supermarket to buy all the groceries needed. While buying all the ingredients, your phone rings. It is your best friend from high school, which is obviously part of the dinner,
so you immediately answer. "Hey darling! What's up?" "Hey,
I saw you are not home, so I figured you went grocery shopping for Christmas. I just wanted to remind you that Mark is lactose-intolerant, and Elizabeth is gluten-intolerant. I don't know what your main dish is going to be this year, but it's just to remind you."
Needless to say, you had completely forgotten about Mark, your best friend's new boyfriend, and about Elizabeth, the new wife of Karl, another
friend. You had planned to make roast-beef and stuffed turkey, with mashed potatoes, and you need to rethink the menu all over again while at the
supermarket! As you browse through the
special dietary needs aisle, you are worried that not everyone is going to like a vegan, gluten
free meal. You are very undecided about what to cook, but you don't want to disappoi nt anyone.

Page Break

Q9
You will now be asked some questions about physical exercise.

On a scale from 1 to 7, please indicate the extent to which you agree with the following statements:

	1 (strongly disagree) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (strongly agree) (7)
Physical exercise is very important to me. (1)	○	○	○	○	○	○	○
I would like to exercise more. (2)	○	○	○	○	○	○	○
Exercising is more important for kids. (3)	○	○	○	○	○	○	○
Exercising is more important for adults. (4)	○	○	○	○	○	○	○
A healthy diet makes exercise more impactful. (5)	○	○	○	○	○	○	○

Page Break

Q14
Now imagine that you are shopping on a regular day of the week: you will be asked different questions on three products which differ in some of their characteristics, but are equally priced.

Answer to the questions as if you were evaluating whether or not to purchase this product. You will be asked to make a choice at the end of this questionnaire, so please consider the different characteristics carefully.

Page Break

Q51

Q65 This laundry detergent is sold at your local supermarket: it is a fairly known brand, which many consumers trust. It **smells like lavander** and it **gives a good, fresh smell to your laundry**. Other advantages of this product are the **handy dispenser** and the **handle** for carrying it. Its packaging is made from plastic and it contains 1,5 liters of product. Its cost is 5,50 EUR.

Q32 On a scale from 1 to 7, please rate the extent to which you agree with the following statements:

	1 (strongly disagree) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (strongly agree) (7)
I like the characteristics of this product (2)	○	○	○	○	○	○	○
I would recommend this product to others (3)	○	○	○	○	○	○	○
I would buy this product myself (5)	○	○	○	○	○	○	○

Page Break

Q49

Q67 This orange juice is sold in your local supermarkets: it is made out of concentrate orange juice by the brand JuicyBreak. Its package is made of

100% recycled carton, which is also naturally **biodegradable.** The juice contained in this bottle was **produced with EU oranges.** The bottle contains 1 liter and it is sold at 2,50 EUR.

Q37 On a scale from 1 to 7, please rate the extent to which you agree with the following statements:

	1 (strongly disagree) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (strongly agree) (7)
I like the characteristics of this product (2)	○	○	○	○	○	○	○
I would recommend this product to others (3)	○	○	○	○	○	○	○
I would buy this product myself (4)	○	○	○	○	○	○	○

Page Break

Q59 These avocados are sold in local grocery stores and have seen exponential sales as they are **rich in "good fat**", so that their consumption has **good consequences** on your body. The way to the shelves is very long: they are harvested in Chile, **more than 12,000 km away** from your local grocery store, . **They are fresh when packed but are processed as they arrive in Europe 1 month after,** when they are distributed to grocery stores. The price of these two halves is 2 EUR.

Q41 On a scale from 1 to 7, please rate the extent to which you agree with the following statements:

	1 (strongly disagree) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (strongly agree) (7)
I like the characteristics of this product (2)	○	○	○	○	○	○	○
I would recommend this product to others (3)	○	○	○	○	○	○	○
I would buy this product myself (4)	○	○	○	○	○	○	○

Q69 This orange juice is sold in your local supermarkets: it is made out of concentrate orange juice by the brand JuicyBreak. Its **package** is made of **100% plastic** and it is **recyclable.**
The juice contained in this bottle **was obtained from EU oranges**. The bottle contains 1 liter and it is sold at 2,50 EUR.

Q39 On a scale from 1 to 7, please rate the extent to which you agree with the following statements:

	1 (strongly disagree) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (strongly agree) (7)
I like the characteristics of this product (2)	○	○	○	○	○	○	○
I would recommend this product to others (3)	○	○	○	○	○	○	○
I would buy this product myself (4)	○	○	○	○	○	○	○

Page Break

Q53

Q63 This laundry detergent is sold at your local supermarket. It is a fairly known brand, which many consumers trust: it is, in fact, **perfume-free and parabens-free and it is particularly suited for sensitive skins**. Another characteristic of these kinds of detergents is that they are **less polluting,** due to being perfume and parabens free. Its packaging is made from plastic and it contains 1,5 liters of product. Its cost is 5.50 EUR.

Q43 On a scale from 1 to 7, please rate the extent to which you agree with the following statements:

	1 (strongly disagree) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (strongly agree) (7)
I like the characteristics of this product (2)	○	○	○	○	○	○	○
I would recommend this product to others (3)	○	○	○	○	○	○	○
I would buy this product myself (4)	○	○	○	○	○	○	○

Page Break

Q57

Q61 These red apples are one of the most common breeds and they are **harvested in your country**. Even more, they are sold in local grocery stores with the tag "**Farm-to-fork"** because they are **produced** very **close to where grocery stores are**

located. They are rich in vitamins, fibers and most importantly, they come from **local farms** which **do not process them.** The price for 500 grams of these apples is 2 EUR.

Q45 On a scale from 1 to 7, please rate the extent to which you agree with the following statements:

	1 (strongly disagree) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (strongly agree) (7)
I like the characteristics of this product (2)	○	○	○	○	○	○	○
I would recommend this product to others (3)	○	○	○	○	○	○	○
I would buy this product myself (4)	○	○	○	○	○	○	○

Page Break

Q71 What do you think of green products in general? On a scale from 1 to 7, rate the extent to which you agree with the following statements.

	1 (strongly disagree) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (strongly agree) (7)
Green products have a smaller negative impact on the environment. (1)	○	○	○	○	○	○	○
Green products are safer for the environemnt. (2)	○	○	○	○	○	○	○
Green products can effectively reduce pollution. (3)	○	○	○	○	○	○	○

Q33 On a scale from 1 to 7, indicate the extent to which you find these characteristics appealing when buying:

	1 (strongly disagree) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (strongly agree) (7)
The product is produced with a focus on saving energy and reducing carbon emissions. (1)	○	○	○	○	○	○	○
The product discourages the use of non-renewable raw materials, using more environmentally friendly materials. (2)	○	○	○	○	○	○	○
The product has low toxicity: it contains less hazardous chemicals and reduces introduction of pollutants in waste water at supplier factories. (3)	○	○	○	○	○	○	○
The product leaves a small environmental footprint. (4)	○	○	○	○	○	○	○