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Course of Consumer Behavior

Analyzing the Trade-off between Healthiness & Sustainability in Food-Related Behaviors:

The Role of Environmental Concern in Food Packaging Choices

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A mia madre, mio padre, e mia sorella,

Ragion d'essere della mia vita,

Ai quali devo tutto.

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Introduction

Since I was a child, I always believed food choices reflect individuals' lifestyle and values. In this regard, food has always been at the core of society, individuals' thought, religion, and even cultural and class differences. In my opinion, adopting a judicious and responsible food consumption behavior means respecting not only ourselves, but also the others. For this reason, food, health, and environmental issues are narrowly related and therefore need to be jointly considered and studied.

Nowadays, there is growing concern among individuals about the implications that their food consumption and buying behaviours have on both the health and the environment. However, literature has not yet explored widely these two aspects concurrently in the context of food consumption and buying behavior.

Thus, the present research aims to explore a research area which is becoming increasingly important today. Specifically, the aim of the research is to shed light on trends concerning food, health and environment in order to introduce the topic concerning the potential trade-off between healthiness and sustainability in consumers' food purchasing choices to all potential stakeholders having a role in pursuing healthy and/or sustainable objectives. Despite of evidences involving the current transition toward a concurrently healthier and more sustainable diet, several issues and obstacles may undermine the effective achievement of both the goals simultaneously. In particular, the present study aims to analyse the potential trade-off between healthiness and sustainability stemming from food overpackaging – intended as a package containing micro-packages – which, on one hand, should help consumers to manage food consumption, and, on the other hand, implies a higher ecological footprint. In this regard, the research attempts to analyse to what extent packaging types influence consumers' purchase intention of food products and so what this implies in managing the trade-off between healthiness and sustainability. Moreover, it will be explored the role of environmental concern in this context, as a driver potentially leading consumers to switch from buying a health-oriented package toward buying an eco-friendly oriented package.

The stakeholders involved in the debate who could be potentially affected by the consequences of the research are

a) Consumers, as the main direct category involved. In this regard, with respect to unpacked food products, micro-packages have the functional aim to indicate the proper food quantity to consume, thus apparently leading consumers toward a saner food consumption. Therefore, the research will shed light on whether and to what extent different packaging types with a different ecological footprint have an impact on willingness to buy, and why. Consequently, new insights concerning the potential trade-off between healthiness and sustainability will make consumers more conscious in their food decision-making process, thus leading them to act in a different way.

b) Food industry, as the category of companies which produces, processes, and commercializes different types of packaging. In fact, the insights provided in this research can influence the entire packaging industry at different levels. In fact, at production stage, it can consistently influence the way of producing

and processing packages, in terms of materials used, shapes and final function, thus following a healthier and more sustainable path without economic losses. At commercial stage, by acknowledging consumers' priorities and way of living, thinking, and acting in food purchase decision-making process, the entire industry will be able to provide better packaging solutions aimed at satisfying consumers' needs and desires. In this direction, the research will evidence more clearly how making choices concerning packaging management.

c) Policy makers and Institutions, as the actors defining the rules and criteria whose purpose is to achieve healthier and more sustainable diet, without the achievement of health goals compromising the achievement of environmental ones.

The present work is articulated in 3 chapters, whose aim is to conduct the reader in a journey involving food, health and environmental trends and issues. The final objective is to provide to all the stakeholders new insights leading them to holistically and concurrently pursuing health and environmental goals in a more conscious and responsible way.

1 Food, Health & Environment

In the first chapter, the lector will be led into a discussion which firstly presents data concerning food, health, and environmental trends, in order to give him/her the possibility to understand why it is relevant to study such topics and relative issues. Then, he/she will deepen the idea of a concurrently healthier and more sustainable diet and explore the reasons for the ongoing transition toward it. Despite evidences about such economic, cultural and social change, there is little attention and research about the potential trade-offs that it can imply. For this reason, it will be afterwards conducted into a section that will clarify why both consumers and food industry can experience choices that entail trade-offs between healthy and sustainable goals. In particular, the discussion will analyse trade-offs that concern issues regarding both food quality and quantity. Thereafter, the research will lead the reader to focus on a specific food quantity topic which entails a trade-off between healthiness and sustainability, that is the issue of overpackaging. Such theme is intended as the potential unnecessary production of more packaging than the amount required to fulfil its main functions, just in order to make consumers more able to manage food consumption and thus to stay healthier. In this regard, the role of packaging in food choices and the actual effects of its production and usage will be deeply analysed.

1.1 Background: food, health & environment

There is rising concern among consumers about the consequences that their food consumption behaviors and decisions have not only on their health, but also on the environment (Hoek et al., 2017; Carrington et al., 2014; Tobler et al., 2011). In this regard, food production is responsible for approximately 20-35% of global greenhouse gas (GHG) emissions, and accounts respectively for 48% and 70% of all land and freshwater resources (FAO & WHO, 2019). In this regard, activities involving food production and consumption, such as cattle farming, transport, food waste and packaging can have negative consequences on the environment.

It means that, already today, food production systems are one the main drivers of environmental degradation and natural resources deficiency. In particular, it is expected that consumers' food consumption choices will have an increasingly greater impact on the environment in the next future.

In fact, changes in demographic, social, and economic factors are consequently influencing lifestyles and food consumption behavior patterns, in the end putting pressure on natural resources used for food production.

In this regard, according to United Nations' *World Population Prospects-the 2008 Revision* (UN, 2009), Figure 1.1 shows over 9 billion people are foreseen on Earth by the middle of this century using the Medium projection. Meanwhile, from a socio-economic point of view, per capita incomes in 2050 are expected to significantly be higher than today, and the relative inequality would be partially reduced. Furthermore, it is expected 70% of world population living in urban areas in 2050 (FAO, 2009).

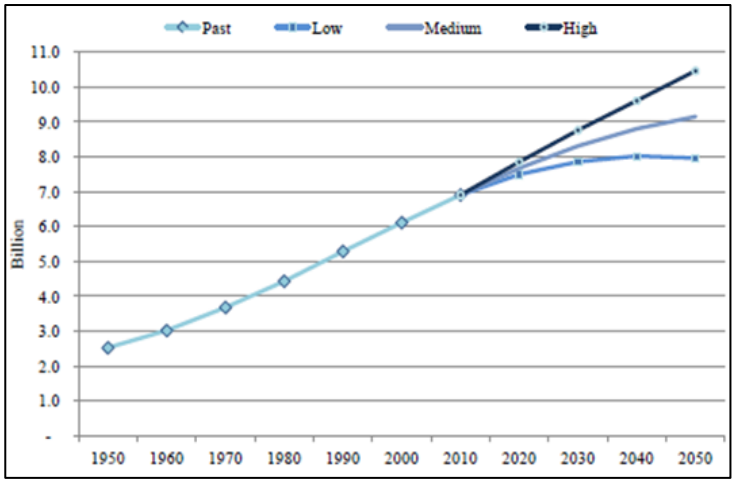

Figure 1.1: "World population: 1950-2010 and projections (three variants)", United Nations (2009)

Therefore, it is predictable a significant increase in demand for food products. More precisely, the projections suggest the necessity of increasing overall food production by at least 70% to deal with population growth expected until 2050 (Godfray et al., 2010). In particular, the Table 1. shows the foreseen growing trend, all over the world, in per capita food consumption until 2050.

	1969/1971	1979/1981	1989/1991	1999/2001	2015	2030	2050
world	2411	2549	2704	2789	2950	3040	3130
developing countries	2111	2308	2520	2654	2860	2960	3070
sub-Saharan Africa	2100	2078	2106	2194	2420	2600	2830
Near East/North Africa	2382	2834	3011	2974	3080	3130	3190
Latin America and Carribean	2465	2698	2689	2836	2990	3120	3200
South Asia	2066	2084	2329	2392	2660	2790	2980
East Asia	2012	2317	2625	2872	3110	3190	3230
industrial countries	3046	3133	3292	3446	3480	3520	3540
transition countries	3323	3389	3280	2900	3030	3150	3270

Table 1.1: "Per capita food consumption (kcal per person per day)", by Alexandratos (2006)

The rising income may lead individuals, especially in developed countries, to consume more food than how is needed for staying healthy. As a result, the main food system goal is to become more efficient. This means producing high-quality food in greater quantities, starting from always more constrained resources, in order to meet the growing food demand. Consequently, the global response to reduce the constant pression on food system involves a higher concern toward a holistic approach to diets, which consider both healthy and environmental issues, also in relation to social, cultural and economic contexts.

In 2014, the FAO/WHO Second International Conference on Nutrition (ICN2) stated that: "current food systems are being increasingly challenged to provide adequate, safe, diversified and nutrient rich food for all that contribute to healthy diets due to, inter alia, constraints posed by resource scarcity and environmental degradation, as well as by unsustainable production and consumption patterns".

Moreover, according to the Intergovernmental Panel on Climate Change (IPCC, 2019), "Consumption of healthy and sustainable diets presents major opportunities for reducing GHG emissions from food systems and improving health outcomes."

In a nutshell, from a managerial point of view, taking into account the negative environmental impact of current food systems and the rising environmental concern, it is crucial to promote diets that are both healthy and sustainable as well as affordable and accepted from a socio-cultural point of view.

At the same time, from a consumers' point of view, consumers are reshaping their priorities due to a growing consciousness about what they put inside their bodies and the relative environmental and societal impact (Nielsen, 2010).

For this reason, to achieve healthier and more sustainable dietary patterns, it is necessary to acknowledge that all the individuals, companies and institutions involved in the production, administration, transformation and packaging, marketing, consumption and disposal of food products, have their own part to play (FAO & WHO, 2019).

Despite of the growing interest toward a healthy and sustainable diet, there is little research about the potential trade-off between healthiness and sustainability concerning consumers' food choices. In particular, the aim of the research is to analyse the respective influence of environmental concern, health consciousness and self-control on the intention of purchasing different types of packaging, which in turn could have a clashing impact on the health and the environment.

1.2 Transition toward a healthy and sustainable diet.

The United Nations Food and Agriculture Organization defines sustainable diets as: "those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources" (FAO ,2010). The European Food Information Council recognizes three pillars to achieve a healthy and sustainable diet, which involve less consumption, the reduction of

consumption of animal-based food products in favour of plant-based alternatives and finally less food wastage (EUFIC, 2018).

With regard to the first pillar, there is a global trend toward overconsumption, although lots of individuals especially in developing countries remaining still poor and hungry. According to Ranganathan et al. (2016), overconsumption is a leading cause of overweight and obesity, and contributes to sustain unnecessary food demand, which in turn affect the environment. For this reason, pursuing a curtailed energy intake diet, especially in developed countries with a higher level of food consumption, can benefit the health of both the environment and the population. Lots of individuals, especially in wealthy regions, consume more food than how is needed, and dietary patterns are rich in animal-based products, a combination that has major negative impacts on the environment. (Aleksandrowicz et al.2016; Alexandratos et al. 2012). In fact, the growing urbanization and the wealthier life condition is leading individuals to increase their calorie intake and to consume more resource-intensive foods, such as meats and dairy (Ranganathan et al. 2016). For this reason, the EUFIC's second pillar to achieve a healthier and sustainable diet involves a reduction in animal-based food products.

In general, producing animal-based foods is more resource-intensive than plant-based foods, and has a higher environmental impact due to land use, freshwater consumption and GHG emissions (Willett et al., 2019; Springmann et al., 2018; Ranganathan et al. 2016; Macdiarmid et al. 2012).

Indeed, for what concerns global progress in food consumption, Figure 1.2 shows the expected increase in meat and dairy consumption (FAO, 2009), despite positive consequences concerning the foreseen trend toward a more diversified diet. More precisely, the meat and dairy production will have to double to meet the expected demand of animal proteins in 2050.

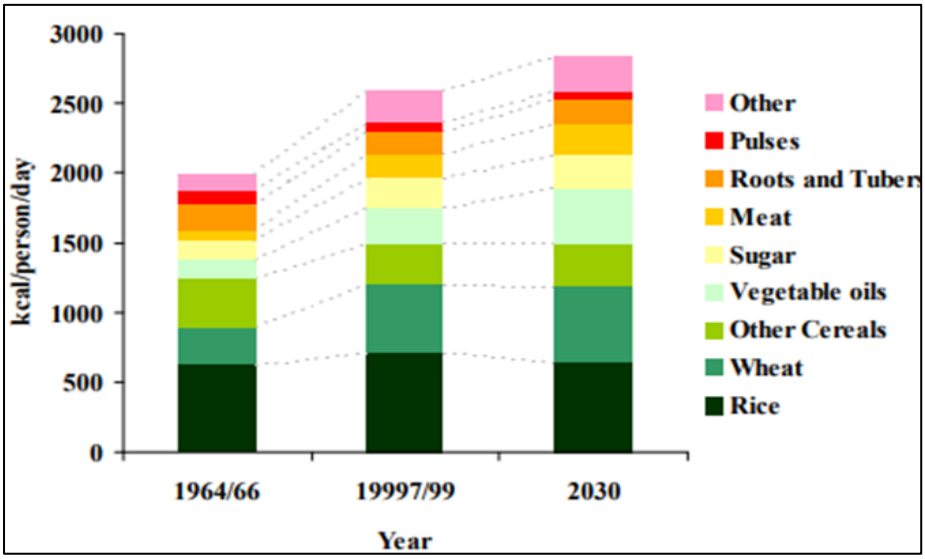

Figure 1.2: "Global progress in food consumption", by FAO (2009)

According to International Food Information Council Foundation report (IFIC, 2019), last year 52% of individuals eats animal protein at least once a day, in contrast with those (34%) who consume plant-based protein at least once a day (Figure 1.3).

This implies a higher ecological footprint, as lowering meat consumption is hugely environmentally relevant (Tobler et al., 2011; Jungbluth et al., 2000).

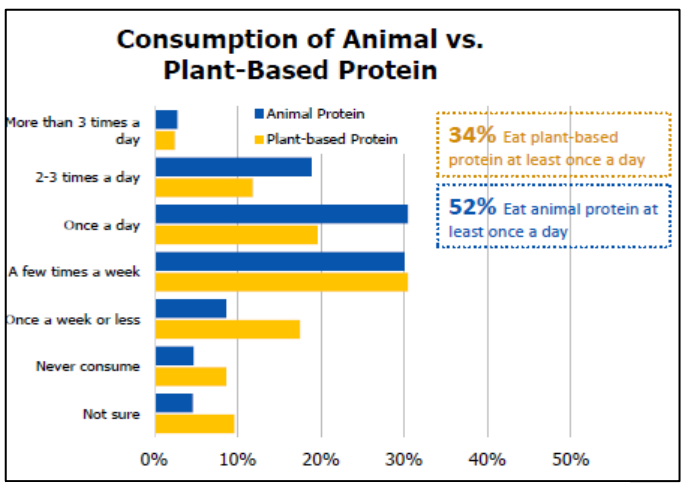

Figure 1.3: IFIC (2019)

For this reason, in order to achieve healthier and more sustainable diet, there is need of shifting toward dietary patterns based on fish, insects and plant-based products, like fruits, vegetables, cereals and pulses, and reducing the consumption of animal-based products such as meat, dairy and eggs in general (Ranganathan et al. 2016; Bakker & Dagevos, 2011; Craig W.J., 2010).

The growing environmental concern will sustain the willingness to adopt plant-based diets. The above-cited survey (IFIC, 2019) indicates that consumers are more familiar with plant-based diets. Such familiarity is leading to a change in consumption, as 24% of people eat more plant-based protein now rather than 12 months ago (Figure 1.4). This confirms that interest in pursuing a more plant-based diet is rising overtime, although perception of such diets seems to be different among consumers.

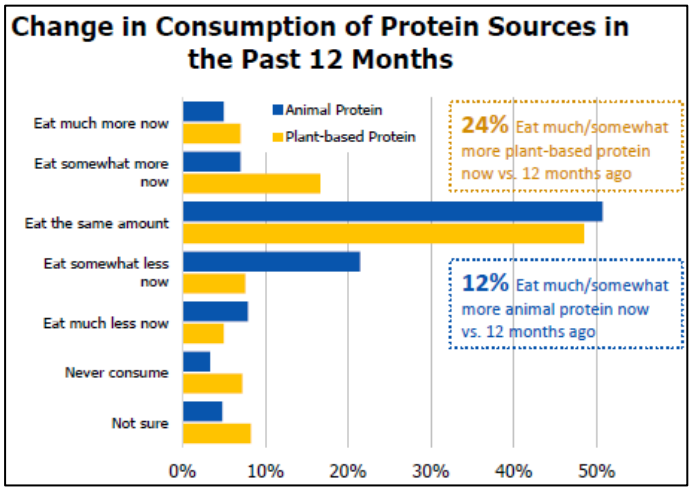

Figure 1.4: IFIC (2019)

The third aspect to consider in order to embrace a more environmentally friendly and healthier diet involves reducing food waste. In fact, the *Estimates of European food waste levels* (Stenmark et al., 2016) indicate that food wastage is directly associated with ecological footprint in terms of consumed energy, climate change, water use and availability of resources. In this regard, producing food that is then discarded represents an avoidable wastage, which is also linked with economic aspects, such as for example resource efficiency, price volatility and waste management, and has a social impact. EUFIC evidences as 30 % of produced food is wasted, enough to feed 200 million people. In this regard, according to Stenmark et al. (2016), in Europe, estimated 88 million tonnes of food are thrown out annually. Food is discarded during all stages of the food chain, by producers, processors, retailers, and consumers, as exemplified in Table 1.2 and in Figure 1.5.

Sector	Food waste (million tonnes) with 95% CI*	Food waste (kg per person) with 95% CI*
Primary production	9.1 ± 1.5	18 ± 3
Processing	16.9± 12.7	33 ± 25
Wholesale and retail	4.6 ± 1.2	9 ± 2
Food service	10.5 ± 1.5	21 ± 3
Households	46.5 ±4.4	92 ± 9
Total food waste	**87.6 ± 13.7**	**173 ± 27**

**Confidence interval*

Table 1.2: "Estimates of food waste in EU-28 in 2012", by Stenmark et al. (2016)

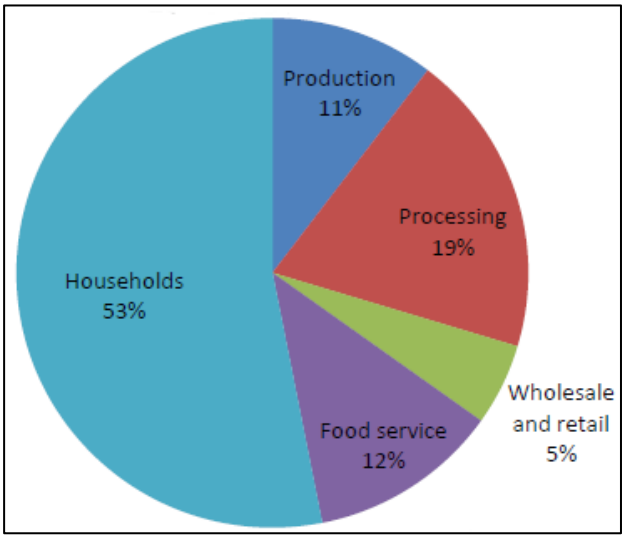

Figure 1.5: "split of EU-28 food waste in 2012 by sector", by Stenmark et al. (2016)

The Figure 1.3 shows as households and processing account together for over the 70% of food waste in Europe in 2012. According to the FAO (2014), if food waste was a country, it would be the third largest producer of carbon dioxide (CO2), which is one of the key determinants of climate change, after the USA and China.

The willingness to switch towards a healthier and more sustainable diet depends not only on the level of consumers' interest involving their own healthiness and the environment, but also on the awareness towards the impact that food consumption behaviours can have on such aspects.

Currently dietary guidelines worldwide aim essentially at health as main target. *According to FAO & WHO (2019)*, "a healthy diet is one which promotes growth and development, and prevents malnutrition. In the global nutrition policy sphere, the term *malnutrition* no longer refers only to undernutrition, such as wasting, stunting, underweight or deficiencies in vitamins or minerals. Malnutrition – in all its forms – is now understood to include obesity as well as dietary factors that increase the risk of non-communicable diseases (NCDs) such as heart disease, stroke, diabetes and certain cancers*".*

The *Food & Health Survey Report (2019)* of the International Food Information Council Foundation (IFIC) shows as individuals believe they are pursuing a healthier diet now, by adopting behaviors such as limiting sugar intake and eating more vegetables and fruits (Figure 1.6). more precisely, the 80% of respondents is trying to limit or avoid sugars in different ways.

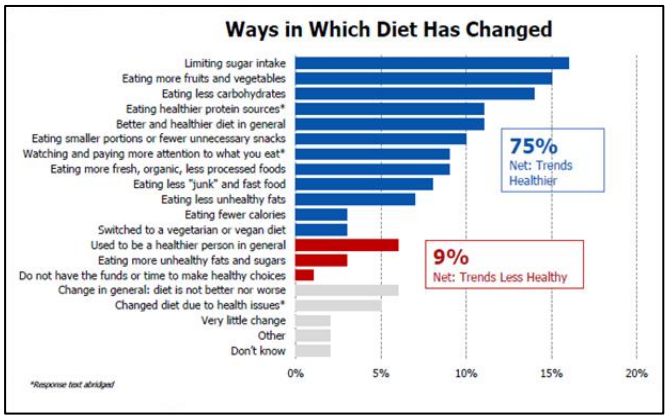

Figure 1.6: IFIC (2019)

Interestingly, among the actions taken to limit sugar intake, it is evidenced also the willingness of reducing the number of calories per day and the consumption of smaller portions. Notwithstanding, as previously outlined, it is expected an increasing trend involving calories intake per day until 2050. This might be justified by the consumers' misperception of needing more calories than how indeed is needed.

Furthermore, Figure 1.7 (IFIC, *2019)* evidences as roughly 25% of consumers actively seek out health benefits from foods and diets, although more than 50% state they simply try to eat healthy in general. Most frequently the benefits they seek are weight loss, energy, digestive health, and heart health. Among the remaining

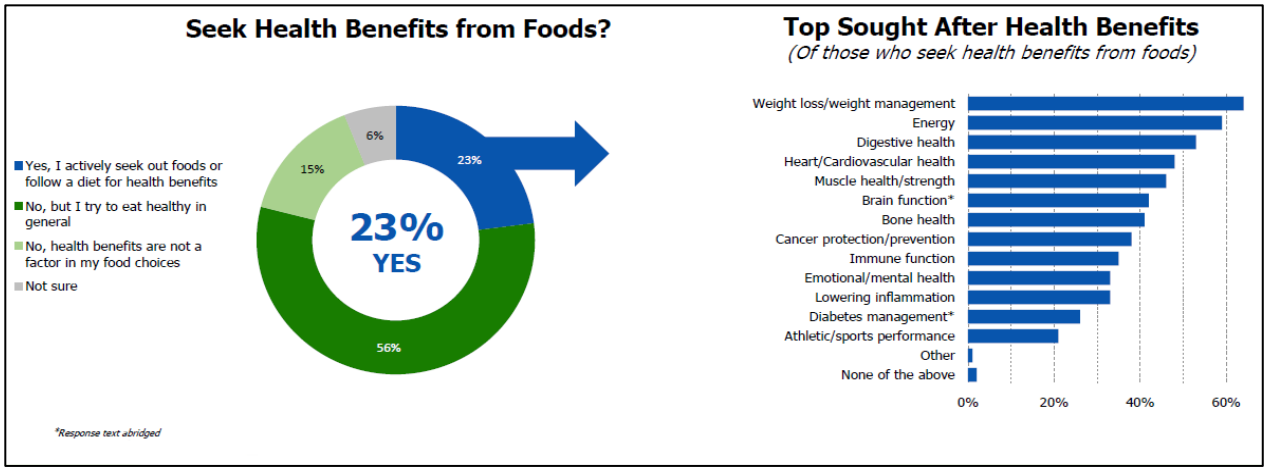

Figure 1.7: IFIC (2019)

individuals not actively finding out health benefits from food, women principally focus more on weight loss than men while older consumers are more interested in cardiovascular health than their younger counterparts. However, an increasing number of research are recognizing the importance of diets and food behaviors that should be based on environmental as well as nutritional science (FAO & WHO, 2019; Hoek et al., 2017; Horgan, et al., 2016; Van Dooren et al., 2014; Friel et al., 2013). In fact, since healthy diets lonely do not produce significant reductions in GHG emissions, dietary guidelines should include recommendations for environmental sustainability. In this regard, environmental concern has grown in the last decade and it is narrowly related to health issues.

According to Lampert et al. (2019), the large majority of individuals worldwide is interested in environmental issues (Figure 1.8). More precisely, *Earth Day 2020* survey (IPSOS, 2020) demonstrates there are several environmental issues of concern across the world (Figure 1.9). Climate change (37%), air pollution (33%) and dealing with waste (32%) are the top three issues for citizens all over the world. However, most of issues are narrowly and reciprocally related.

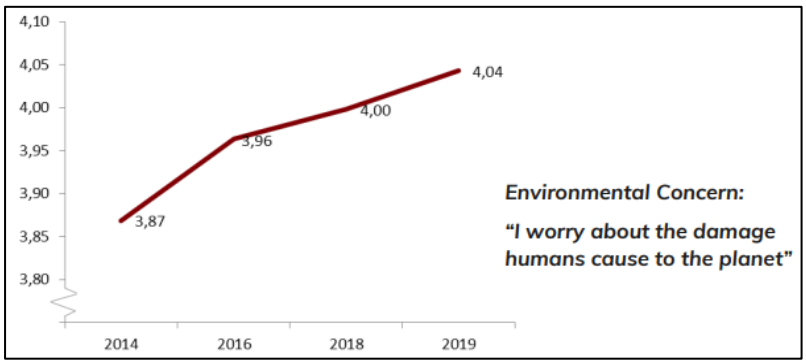

Figure 1.8: "Ecological concern worldwide", by Lampert et al. (2019) – Mean global score on the 5-point Likert scale.

For example, waste management is strictly related with the over-packaging of consumers goods and depletion of natural resources. Furthermore, climate change is linked with air pollution, de-deforestations, emission, and waste management. For this reason, there is need to have a holistic approach to deal with environmental issues.

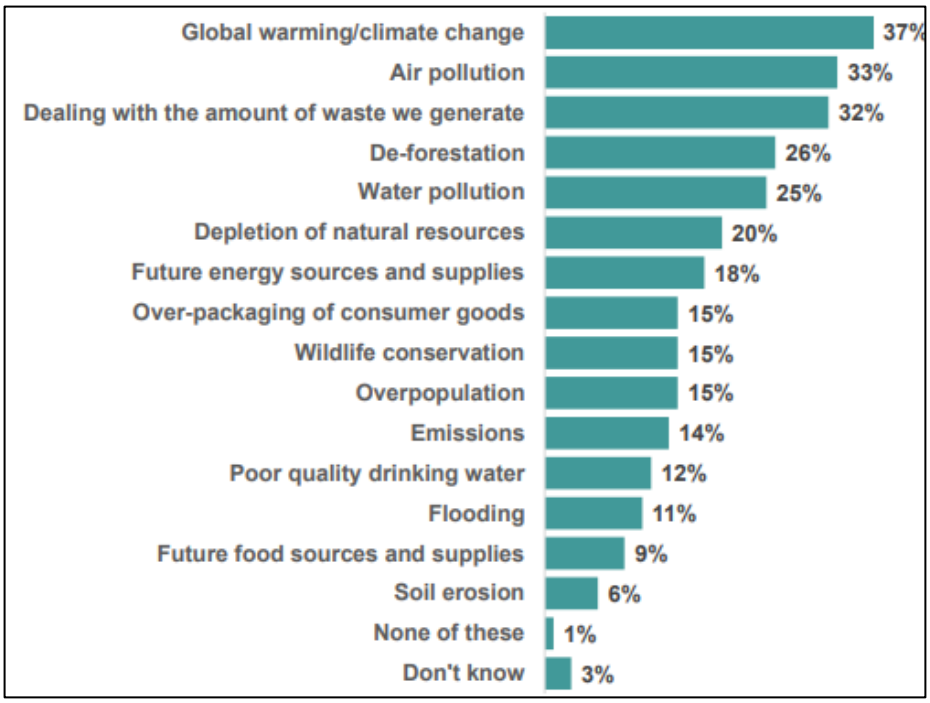

Figure 1.9: IPSOS (2020). – "In your view, what are the three most important environmental issues facing [COUNTRY] today? That is, the top environmental issues you feel should receive the greatest attention from your local leaders?"

Lampert et al. (2019) evidence the percentage of individuals worried about the potential damage humans can cause to the Earth is grown up from 71% in 2014 to 77% in 2019. Such trend considers both advanced (+7%) and developing (+6%) economies, in all age groups, educational levels and genders. This means that environmental concern is a unifying topic for the entire human race a whole. The above-cited report reveals also that people worldwide have come to realize that each single person should have an active role in pursuing personal and social wellbeing. In particular, Lampert et al. (2016) recognize several trends pointing out in which way environmental concern goes beyond that feeling of anxiety concerning humans' ecological impact and encompasses other societal changes and aspects of individuals' life as well.

In other words, that general feeling of concern towards the planet has also become a clear intention to carry out practical lifestyle changes, which can be recognized in a rising eco-consciousness (Figure 1.10) and vitality (Figure 1.11). A higher eco-consciousness implies that people are becoming more aware about the ecological footprint of their food consumption behavior. So, those people who try to live more eco-consciously believe strongly in environmental and nutritional science and thus are more likely to consume organic food and to adopt vegetarian diets (Kearney, 2010). A higher level of information about ecological degradation led to an increasing environmental concern that, in combination with an increasing availability of sustainable alternatives, has led individuals to make practical changes in their food consumption behaviours. The higher environmental knowledge and concern is leading to an increase in individuals' vitality. In fact, according to the Lambert's report, "the vitality trend is deeply related to a broader desire to live in a healthy environment. Being healthy requires a healthy environment to live in." In this regard, individuals' environmental concern and health consciousness are growing concurrently and will continue to grow in the next future, with several implications for governments, companies and NGOs.

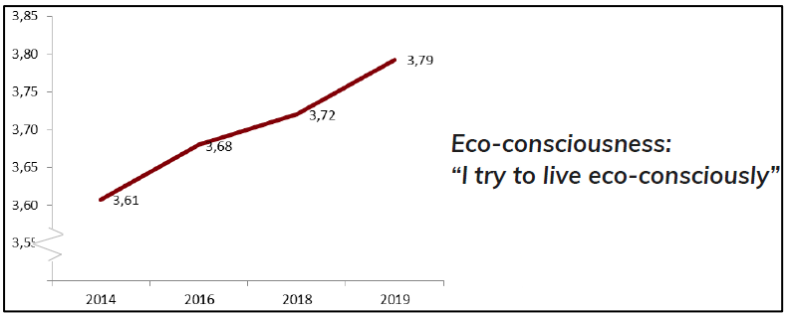

Figure 1.10"Eco-consciousness", by Lampert et al. (2019) - Mean global score on the 5 point Likert scale.

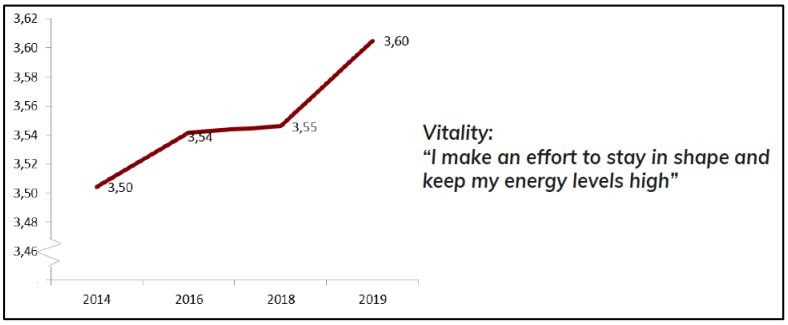

Figure 1.10 "Vitality", by Lampert et al. (2019) – Mean global score on the 5-point Likert scale.

Such positive trends involve also the food industry, as both environmental sustainability and healthfulness are considered important factors in influencing food product purchase. During the last decade, the IFIC Foundation's annual *Food & Health Survey* asked consumers whether sustainability was an element in their food purchasing decisions. The *2019 Health & Food Survey* (IFIC, 2019) indicates 54% individuals involved in the research consider environmental sustainability in food products as a relevant driver in influencing food purchase intention (Figure 1.11)

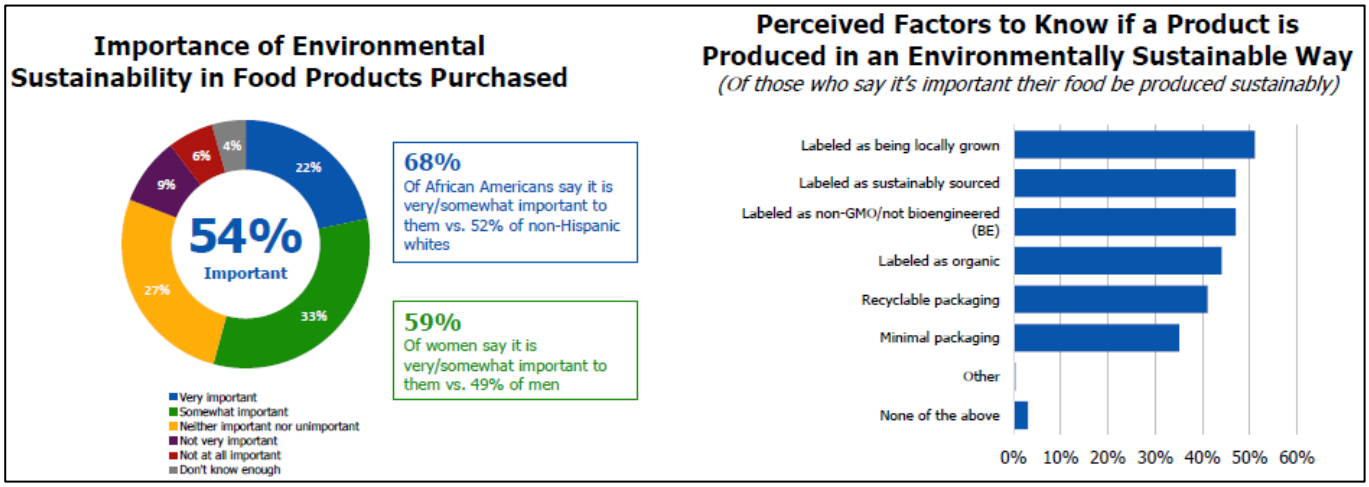

Figure 1.11: (IFIC, 2019)

In particular, it is very relevant for consumers to realize how to recognize eco-friendly sources. Almost 60% of consumers point out it is difficult to acknowledge whether personal food choices are environmentally sustainable. Moreover, 63% of individuals indicates it would have a stronger influence on their purchase intention if it were easier to perceive. However, according to the last *Food & Health survey report* (IFIC, 2019), environmental sustainability still remains the lowest of the purchase drivers.

The Figure 1.12 confirms the key role consumers give in diets to health issues, rather than to ecological ones. In fact, healthfulness has a major impact with respect to environmental sustainability on purchase intention of food and beverages.

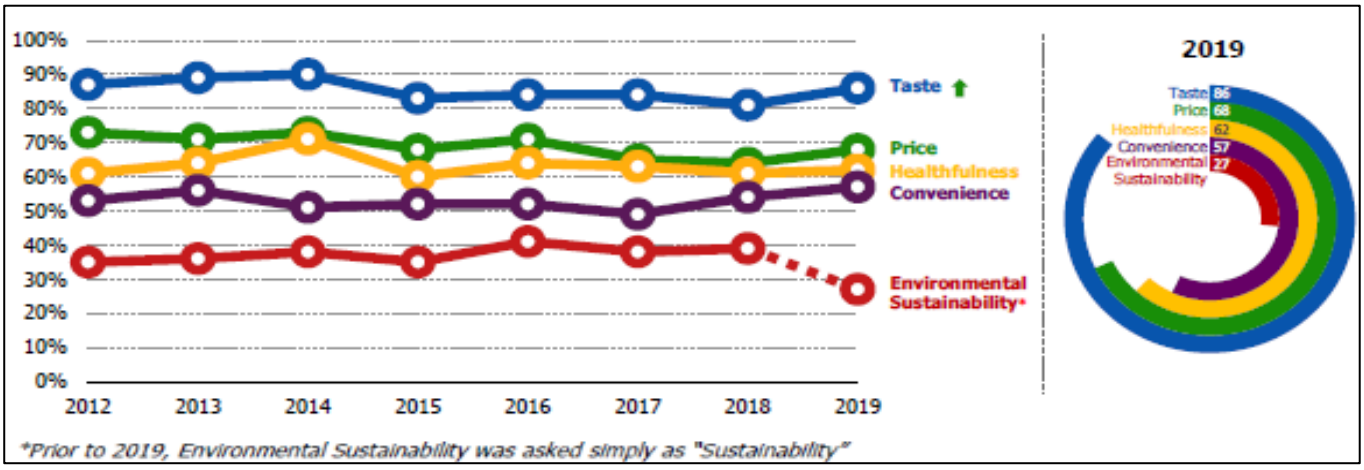

Figure 1.12: "Purchase drivers over time (% 4-5 Impact out of 5), by IFIC (2019)

Notwithstanding, it seems to be clear that environmental sustainability will increasingly influence consumers' food purchase and consumption behaviours overtime.

In conclusion, the positive trends involving health and environmental concern are naturally leading toward a diet which is concurrently healthier and more sustainable. This seems to be the best response to achieve most of United Nations Sustainable Development Goals, such as those on hunger, healthy lives, climate change, water management, and terrestrial ecosystems.

However, it is crucial to discuss also to what extent health and sustainability can be in conflict and how much consumers' choices can entail trade-offs concerning these two relevant topics.

1.3 The potential trade-off between healthiness and sustainability regarding food choices

"*Understanding and acknowledging the trade-offs that consumers might encounter or perceive is important in order to avoid that policies pursuing one goal are negatively impacting the other, and instead ensure they are mutually supportive*."

Jessica Aschemannn-Witzel, 2015

Achieving a healthy and sustainable diet may require trade-offs. In fact, despite evidences about synergies between healthiness and sustainability in food consumption behaviours, there are circumstances when pursuing the first goals may affect negatively the other one. According to Honkanen et al., (2006), Consumers food consumption choices are influenced either by self-centred reasons or "altruistic" reasons.

A food purchase motive such as health is identified as a self-centred one, while sustainability is regarded as an altruistic one (Aschemann-Witzel, 2015). Thus, Honkanen's et al. (2006) research suggests individuals giving priority to self-centred motives might eschew more environmentally-sustainable food product choices, whether a trade-off is supposed to occur between a self-centred motive like health, taste, or price and an attribute that should be beneficial for the whole society.

There are several evidences concerning potential trade-offs between food healthy choices and more eco-friendly alternatives. Such trade-offs involve food choices in consumers' diet for what concerns both quality and quantity issues. In this regard, consumers deal with trade-offs involving both what type of food should be consumed and what should be the proper food portion size.

For instance, as regard to consumers' choices concerning trade-offs between food type and the level of environmental sustainability, healthy eating recommendations involve a higher consumption of fruits and vegetables (FAO & WHO, 2019). Notwithstanding, plant-based food products are characterized by a high ratio of losses in production and retailing, and heavily contribute to household food waste (Parfitt et al., 2010). Moreover, several products in this category require a lot of resources in terms of transportation and storage such as for example those foods imported from the southern hemisphere. Thus, eating them less frequently could have a positive impact on the environment in terms of less GHG emissions (Garnett, 2011). However, the research suggests increasing plant-based food consumption whilst reducing animal-based and highly processed food consumption could have a positive influence on the environment in terms of lower GHG emissions at the end. In fact, Weber & Matthews (2008) recognized the concept of "food miles" is leading to overestimating the ecological impact of transportation. For most food products, the share of transportation is reduced by the crucial impact of the production stage, unless transportation distance is covered by aircrafts. Moreover, according to Carlsson-Kanyama (2009), consuming a minor amount of highly processed foods in the diet should satisfy both healthy and sustainability objectives, because implies lower energy use and potentially also less package material needed. Moreover, consumers deal with trade-offs between food-quality and environmental

sustainability even when decide to consume locally-grown foods. In fact, such food choice can be a sustainable one if individuals eat seasonal foods only during the season in which they are available. Actually, the cost of producing or stocking locally-grown foods outside from their natural growing seasons could be superior to shipping foods that are in season somewhere else. The reason for this is that the amount of energy consumed to cultivate plant-based foods in warmed greenhouses in winter is deeply higher than the energy needed to ship them from warmer countries (Garnett et al., 2014). So, switching toward a diet characterized by only local and seasonal food means in some way prioritizing environmental sustainability rather than healthy aspect, being food variety in diets a driver for consumers' wellbeing. Furthermore, another trade-off concerning healthy diets and environmental sustainability involves fish consumption. In fact, despite of well-known relative benefits, it is recognized that increasing fish consumption in line with dietary guidelines may be a problem for the environment, because overfishing and depletion of some fish stocks could deeply affect entire ecosystems and wildlife (Garnett et al., 2014).

Although today consumers' pay more attention on issues concerning food quality rather than quantity, health and sustainability trade-offs can occur also with refer to food quantity and portion size. Aschemannn-Witzel (2015) affirms overconsumption has a serious impact on both health and the environment. In this regard, consuming the proper food quantity would be beneficial from both perspectives. The EUFIC (2018) says consuming the proper quantity helps individuals to stay healthy and avoid obesity. More precisely, there is evidence that setting a limit to the consumption of energy-dense low-nutrient foods and being care about correct portion sizes are both useful ways for staying healthy. According to Reisch & Gwozdz (2011), a good approach for pursuing healthier diets consists of making "the healthy choice the easy choice". In this context, packaging seems to have a key role. Indeed, producing packaging in smaller units or units including several individually wrapped portion sizes seems to discourage unhealthy overconsumption. Despite of potential health benefits, a major production of packaging materials could affect the environment in different ways. EUFIC (2018) stresses the idea food packaging, particularly when made of non-ecological materials, can have a significant impact on the environment in terms of consumer household waste (Marsh & Bugusu, 2007), consumed energy, global warming, water use and availability of resources (Stenmark et al., 2016). The idea of packaging as a mean for delivering the proper portion size seems to lead to a trade-off between healthiness and sustainability. However it has also been suggest there could be "no apparent contradiction" between environmental and health aspects of consumers' diets (Carlsson-Kanyama, 2009), due to the type of packaging material – biodegradable, fully recyclable, or made from recycled materials – and the choice of reuse systems (Marsh & Bugusu, 2007). In this regard, there is need of further research on such argument. Given the unclear impact of packaging waste on the environment, and thus its role in trade-offs concerning healthy and sustainable aspects of food consumption, next step of the present research is to shed light on such topic.

1.4 The role of packaging in healthy and sustainable diets

"No more packaging should be used than is required to fulfil its functions, thus guaranteeing that packaged products satisfy consumers' demands."

Hérodin & Flanderka (2004)

Nowadays packaging has a key role also in food industry for consumers, as it protects and promotes the product, provides information on potential food healthiness, on how to consume it and on the proper portion size (Consumers Goods Forum, 2011). Furthermore, it provides consumers with easier purchasing choices. The role of packaging – whose original function was "to contain, protect, handle, deliver or present goods" (Eurostat, 2017c) – has been changing due to a significant change in consumers' lifestyle (Herodin & Flanderka, 2004). The rising concern about healthiness and sustainability is leading consumers to potentially adopt food consumption behaviours which are concurrently healthy and environmentally friendly. In this regard, package is proving to be a mean to achieve health and ecological-oriented results in diets. In fact, from a health point of view, definitely it can be used for indicating the correct portion size and leading consumers toward a more judicious food consumption. Additionally, from an eco-friendly point of view, packaging can positively contribute to environmental sustainability of a product in several ways. According to *Consumers Goods Forum Global Packaging Project* (2011), ecological packaging should be: *"*designed holistically with the product in order to optimise overall environmental performance; made from responsibly sourced materials; able to meet market criteria for performance and cost; manufactured using clean production technologies; efficiently recoverable after use; sourced, manufactured, transported and recycled using renewable energy.*"* In this regard, the report stresses the idea of the potential social, economic, and environmental benefits which can arise from a good packaging management. For this reason, food companies should attempt to prevent or at least limit any negative impact arising from packaging production or disposal.

The problem concerning packaging management is twofold and entails both underpackaging and overpackaging, which concurrently affect the environment, as evidenced in Figure 1.13.

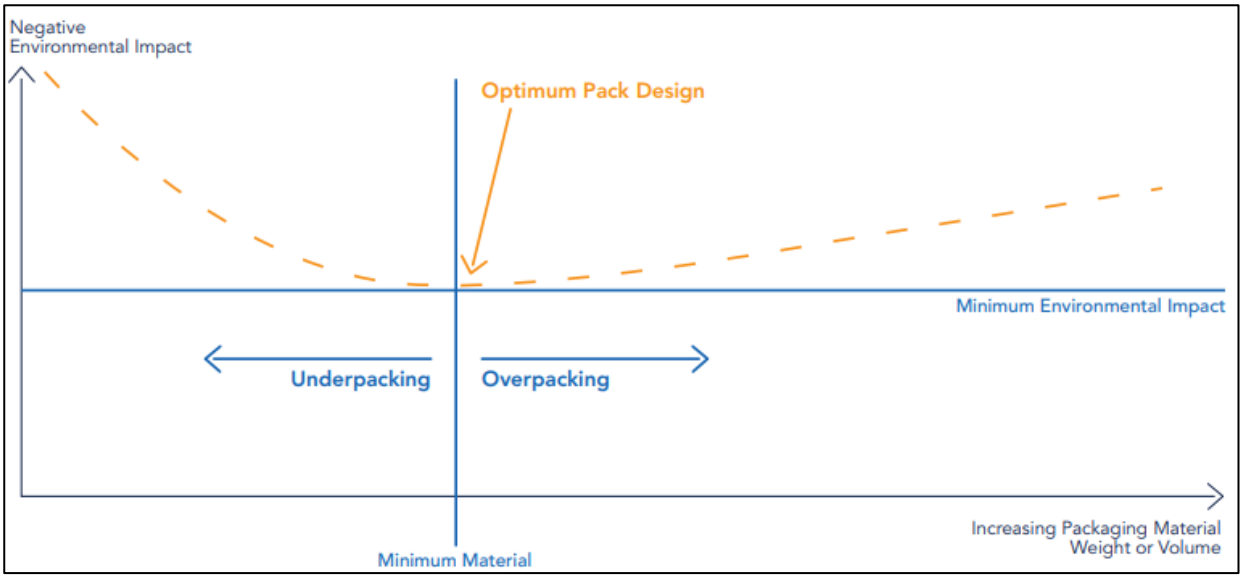

Figure 1.13: "Innventia AB model – optimum packaging", by Consumers Goods Forum (2011)

In particular, the model shows that the ecological concerns of product losses caused by too much underpackaging are conspicuously greater than overpackaging. This is because generally products have a much higher intrinsic value than the packaging used to protect them. This implies product losses due to underpackaging may potentially have a much higher environmental impact than the gains made through excessive underpackaging. However, it is clear as both such trends negatively affect the environment. Interestingly, according to *Earth Day 2020* survey (IPSOS, 2020), the overpackaging of consumer goods is a top three environmental issue for 15% of citizens all over the world (Figure 1.14). Considering the most consistent consumer food market in the world by revenues (Table 1.3), the Figure 1. 14 shows in United States and India the percentage of individuals who consider overpackaging a top three environmental issue falls away below the global average (respectively 9% and 6% against global 15%).

Consumer Food Market Outlook – Top 5 countries	
1. United States	*€ 621.759 m*
2. China	*€466,959 m*
3. India	*€254,650 m*
4. United Kingdom	*€123,834 m*
5. Japan	*€123,591 m*

Table 1.3: "Global Comparison – Revenue in Million €", by STATISTA (2019)

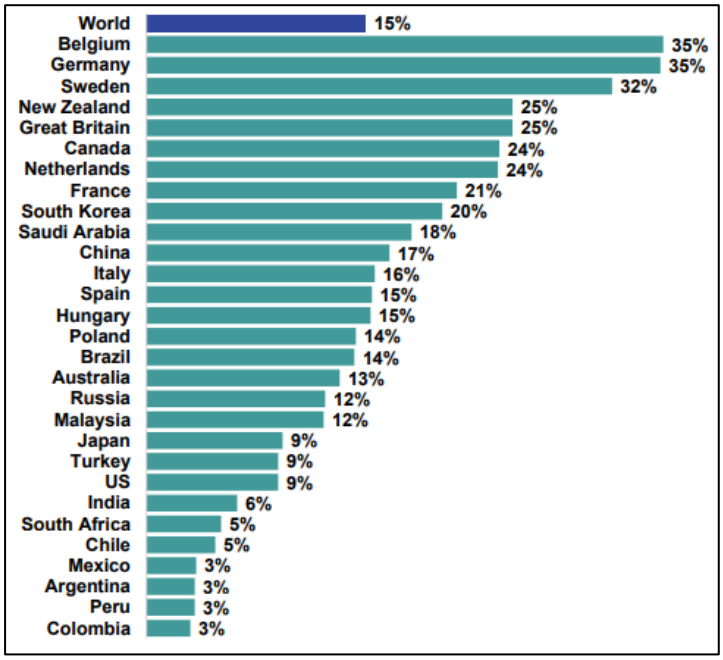

Figure 1.14: IPSOS (2020). – "In your view, what are the three most important environmental issues facing [COUNTRY] today? That is, the top environmental issues you feel should receive the greatest attention from

It is crucial to analyse in which way food overpackaging could affect the environment in the context of food industry. Packaging reflects individuals' lifestyle (Hérodin & Flanderka, 2004). In this respect, the growing population and the presence of more single-person households, together with changes in dietary patterns and packaging trends, concerning for example the development of smaller packs inside a larger one, are contributing towards a rising demand for plastic packaging. In this regard, packaging is mainly made of plastic because with respect to cardboard, cans or glass, it is lighter, more flexible and less expensive (ING, 2019). Despite of its benefits, plastic heavily contributes to environmental degradation. As consumers are developing higher environmental concern and consequently negative attitudes towards plastic, food industry is striving for less packaging material, better packaging and more recycling. In this regard, packaging represents almost 40% of plastic demand in Europe (Plastic Europe, 2019), and food packaging accounts for a consistent percentage of

such demand, as evidenced in Figure 1.15. In fact, the estimates indicate 16% of total European plastic demand – 8.2 million tonnes of plastic – is used for food and drink packaging only in Europe (ING, 2019).

In addition, Figure 1.16 shows the use of plastic for food packaging, due to its intrinsic characteristics, heavily contributes to plastic waste (59%).

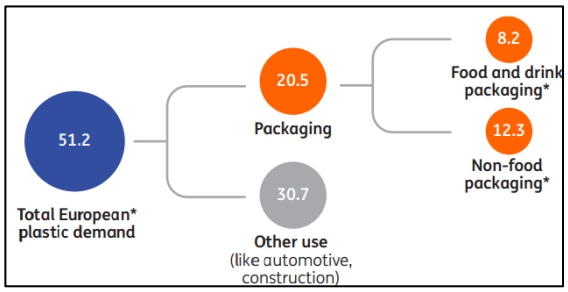

*Figure 1.15 "plastic demand by segment, 2018, million metric tonnes", by ING (2019) - *Europe is EU28, Norway and Switzerland*

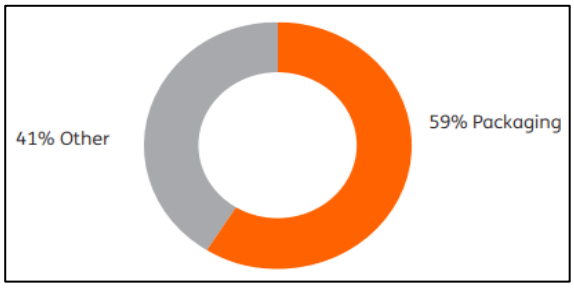

Figure 1.16 "Share in plastic waste by segment (2015)", by ING (2019)

More precisely, the volume of plastic packaging waste is growing by 2% per year (ING, 2019), due to the increasing demand for convenience food products such as packaged meals, fruits and vegetables. Moreover, there is evidence of increasing production of micro-packs wrapped in a large one, because consumers either need to consume food at work or tend to overconsume certain products such as for example cookies and crackers. For this reason, to manage relative consumption, some consumers prefer to buy smaller packages. (Jain, 2012; Scott et al., 2008). All these are reasons why in lots of countries the production of packaging and consequently the amount of relative waste is increasing over time. Curiously, according to Tobler et al. (2011), considering all eco-friendly food consumption behaviours, consumers strongly believe that reducing waste by avoiding overpackaging have the most positive impact on the environment, despite of evidences from Life Cycle Assessment (LCA) results, which do not consider packaging waste as having the most significant ecological impact (Jungbluth et al., 2000).

However, it is clear as, in the context of food industry, the issue of overpackaging may entail a trade-off in dietary choices between healthiness and sustainability. In fact, overpackaged goods may be a cause of rising unnecessary waste and environmental degradation and for this reason health consciousness, self-control and environmental concern seem to have an impact on purchase intention of different food packages.

Given that all types of packaging have some environmental impact in terms of consumed energy, freshwater and waste, it is recognized also the key role both companies and consumers have in preventing environmental degradation. In this regard, waste prevention should not entail merely a qualitative and quantitative decrease in packaging materials, but rather should look at the entire process chain (Herodin & Flanderka, 2004). So, from a consumer's point of view, there is need to embrace the three "Rs" of sustainability: reduce, reuse, and recycle. At the same time, companies should aim at reducing waste by adopting more eco-friendly materials and using more functional package shapes (EUFIC, 2020). However, according to EUFIC (2020), although swapping towards more eco-friendly materials and improving product design can positively influence the environment, basically all types of packaging could potentially deny such effects in some measure, due to their intrinsic nature of waste after consumption. In fact, both recyclable and eco-design packaging aim at achieving sustainable

objectives but present some troubles from both consumers and companies' side. In line with Mintel's *Global Packaging Trends 2020* report, although consumers are becoming more familiar with the mantra "reduce, reuse, recycle", recycling process still present difficulties for different reasons. In fact, often consumers do not remember to throw away the package to the proper recycling bin or to give back to store take-back system. Moreover, individuals are not always aware about how to dispose different packages. In addition, another challenge involves whether the proper facilities for waste removal are available in a specific area (EUFIC, 2020).

Also companies are striving to achieve eco-friendly results in producing new kinds of packaging. As regard to recyclable packaging, Mintel's *Global Packaging Trends 2020* report indicates that currently the demand for recycled plastic significantly exceeds supply. Considering the companies' 2030 target of producing fully recycled packages, the research states "new and rapidly scalable recycling and processing technologies must be conceived, commercialised, implemented and promoted*"*.

In fact, nowadays only 30% in Europe and 9% of the world's plastic waste is recycled and, in details, 42% of plastic packaging waste in Europe (Figure 1.17).

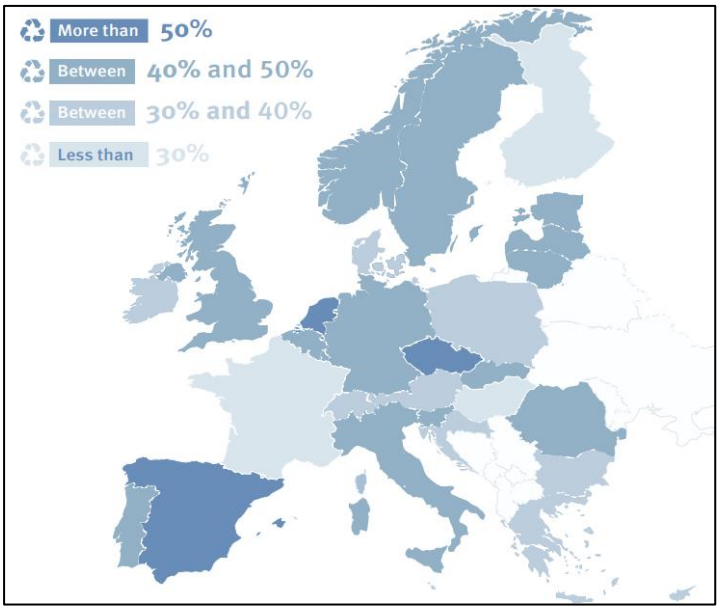

Figure 1.17: "Plastic packaging recycling rates across Europe in 2018", by Plastic Europe (2019)

However, this does not imply companies could significantly and rapidly swap to other materials, because it is not realistic if considering the production volume of some products and thus the relative costs. EUFIC (2018) evidences other ecological opportunities in producing packaging. More precisely, in some cases package has been redesigned to consume less plastic while preserving characteristics of the original product through a process defined as "lightweighting". Another opportunity consists of using biodegradable materials, which are often made from organic sources such as corn or vegetable oils whose key feature is to release less greenhouse gases. However, for waste processors and sorters, the issue is to handle with the broad range of plastic waste into homogeneous streams. For this reason, Combinations of plastic (such as a polyethylene milk carton with a polypropylene lid) and of paper and plastic (such as coffee cups) make recycling a more difficult process (ING, 2019). In this regard, given the idea single-use plastic will be produced for a long time yet, it is vital for all companies and consumers embracing the idea of recycling in packaging management. To that end, package manufacturers must strongly promote all eco-friendly issues concerning packaging by making consumers more engaged with such issues and more conscious about packaging ecological potential footprint, thus leading them to play an even more key role in achieving environmental objectives.

Despite clear difficulties, Plastic Europe's report (2019) shows since 2006, the quantity of plastic post-consumer packaging waste sent to recycling has increased by 92% (Figure 1.18) and also there has been an increase of 84% of energy recovered, with consequent positive impact on the environment.

Recent trends concerning rising environmental concern and knowledge clearly indicate the route to follow. All those industries which have to deal with packaging management, and especially food packaging industry, that accounts for a consistent part of the entire plastic demand (ING, 2019) must pursue the development and commercialization of recyclable package innovations, although it is clear there is not yet possibility to recycle 100% of them (Mintel, 2020).

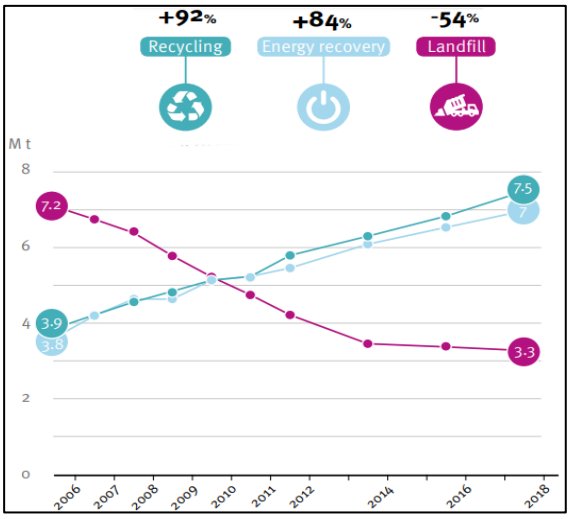

Figure 1.18: "2006-2018 evolution of plastic packaging (from household, industrial and commercial packaging) waste treatment (EU28+NO/CH)", by Plastic Europe (2019)

In summary, there are several ways in which the food industry can reduce the ecological footprint of packaging. More precisely, companies may aim at reducing the weight and using more biodegradable or recycled plastic in packaging, improving its recyclability, switching to other packaging materials. On the other side, it is crucial making consumers more conscious of their potential key role for the environment, and also giving them the possibility to efficiently play such role. However, there are limitations involving such solutions and for this reason EUFIC (2018) states the need to focus on the first "R" of sustainability, which is "reduce", because has the highest impact on the environment.

In this regard, despite eco-friendly trends concerning packaging, the issue of overpackaging still represent an important problem and may entail a trade-off in food choices between healthiness and sustainability. In fact, on one hand, overpackaged goods contribute to produce unnecessary waste and consume more energy and freshwater, thus leading to environmental degradation. On the other hand, developing micro-packs may help consumers to control their food consumption, with good results in terms of healthiness. This trade-off involving the production of different packaging types could influence consumers' purchase intention, depending on their priorities. In analysing such potential trade-off, in addition to the influence of environmental concern and health consciousness, it is helpful to consider the role of self-control, which may have a decisive role within this framework.

2 Theoretical Background & Hypothesis Development

The aim of the second chapter is to build a conceptual framework whose purpose is to shed light on the potential trade-off arising from packaging choices in food consumption behaviours, stemming from different individual priorities involving health and sustainability. For this reason, the reader will have the possibility to review in-depth the literature involving the role of packaging in influencing consumers' food consumption behaviours and purchase intention. By deepening its characteristics, functions, and relative role in consumers' food choices, the research aims at clarifying whether there is a direct influence of packaging type on consumers' purchase intention. Therefore, the reader will be provided with a dissertation regarding the role of self-control in food consumption behavior and in reducing food overpackaging. Such aspect could better explain and justify the reason why differences in consumers' concern for healthy and sustainable issues may influence food decision-making and type of package purchased. Given the relevance of health issues in consumers' food choices and the ongoing trends, research will further examine previous studies aiming at concluding how health consciousness predicts multiple health attitudes and behavior. Finally, the discussion will focus on the potential role of the rising environmental concern in influencing the form and strength of the above-mentioned relationship. It means taking into account past research on the topic and examining whether and to what extent the ongoing trends involving eco-friendly attitudes have an influence on the willingness to buy either more ecological packaging or packaging more functional for managing self-control and food consumption.

The theoretical background will be functional for developing the conceptual framework and the hypothesis that will be tested and discussed in the last part of the research.

2.1 The effect of different packaging types on purchase intention

Packaging has always reflected individuals' needs, desires and lifestyles (Herodin & Flanderka, 2004). In this regard, demographic, social, economic, and cultural trends are fostering significant changes in business activities and food consumption behaviour. For this reason, the food packaging industry – which accounts for about half of the entire packaging industry (Robertson, 2013) – is striving for satisfying a changing consumer demand. Several academic and scientific research in the last decades have focused on its characteristics, functions, and relative role in consumers' food choices, in order to deeply understand how people behave in certain situations and to give companies managerial cues to better satisfy consumers' demand and needs. It is worthwhile to start by focusing on the historical development of packaging in terms of definitions and functions, to go afterwards through research that have explored its consequent role in food choices.

Packaging has been defined as "the enclosure of products, items or packages in a wrapped pouch, bag, box, cup, tray, can, tube, bottle or other container form to perform one or more of the following functions: containment, protection, preservation, communication, utility and performance" (Manypenny, 1988). Lockhart (1997) has defined packaging as a "socio-scientific discipline which operates in society to ensure delivery of goods to the ultimate consumer of those goods in the best condition intended for their use. According to the researcher, it has a protection, utility, and communication function. Kotler (2005) defines packaging as "all the activities of

designing and producing the container for a product". Moreover, it has been also defined just as an extrinsic element of the product (Deliya & Parmar, 2012). Specifically, primary packaging has been recently defined as the first material covering the product, normally in direct contact with it (Elgaaïed-Gambier, 2014; Robertson, 2013). Examples of primary packaging are plastic wraps, paperboard cartons, glass bottles and metal cans. In addition, the researchers identify as secondary packaging what is external to the primary packaging and is functional to gather more units of primary packages. (Elgaaïed-Gambier, 2014; Robertson, 2013). Especially in the modern society, according to Robertson (2013), packaging "surrounds, enhances and protects goods we buy from processing and manufacturing, through handling and storage, to the final consumer."

In nowadays dynamic environment, also Rundh (2013) evidenced packaging has logistics, commercial and environmental functions. Many marketers and researchers have analysed in details packaging functions and objectives from both companies and consumers' points of view. In this regard, through the eyes of companies, the growing functional importance for marketers led them to consider it the fifth P of marketing mix together with product, price, placement and promotion (Kotler, Keller, Ancarani & Costabile, 2017). There are several reasons which justify why packaging is crucial in achieving commercial and environmental objectives. In this part of the research the first aspect will be consistently analysed. There is always wider availability of packaged food products in supermarkets and grocery stores which contribute to increase food choice alternatives. This implies a rising competition among different brands and packaged food products (Khan et al., 2018). In this regard, packaging is being increasingly considered of crucial importance for brand promotion and communication with customers (Ahmed et al., 2014; Rettie & Brewer, 2000). In the modern society, a suitable packaging can differentiate companies' products (Mirabi, 2015) and leverage brand equity (Keller & Swaminathan, 2020). In fact, packaging is a crucial factor of brand recognition, which can create positive brand associations (Keller & Swaminathan 2020). In fact, it could have a strategic function in giving a competitive advantage – and thus an increase in terms of product sales (Yang & Raghubir, 2005) – when it appears not to be a great distinction among different brands (Keller & Swaminathan 2020). Furthermore, according to Kauppinen-Raisanen & Luomala (2010) customers positively assess product's packaging if its elements efficiently and significantly convey the meaning of the product at hand. In this regard, packaging features – which are colour, size, font graphics, material, and shape (Keller, 2020) – and final aim could influence consumers' buying decision-making process. Consumer's purchase intention has been defined as the willingness to acquire a specific product or service in certain situations (Younus et al., 2015). According to Shah et al., (2012) it is a decision-making process that focuses on the reasons which lead consumers to buy a specific brand. Furthermore, it has been also described as the consumers' process of searching for, selecting, purchasing, using, and disposing of goods and services, with the aim of satisfying needs and desires (Deliya & Parmar, 2012). Ghosh et al. (1990) have argued that analysing purchase intention is functional in order to foresee buying process. In fact, higher levels of consumer's purchase intention are more likely to generate actual purchase behavior (Keller, 2020). For this reason, according to Morwitz (2012), marketers should attempt to

foster consumers' purchase intention in order to significantly influence consumers actual behavior. There has been a great amount of research concerning the relationship between packaging and purchase intention.

Through the eyes of consumers, packaging has a crucial role in purchase decision-making process for several reasons. Shafiq et al. (2011) suggest consumers' purchase decision-making process is influenced by previous experiences, price, promotion, and packaging. In this regard, such process is often not rational. Also for this reason, consumers often evaluate product quality based on packaging. In fact, it has a function of protection and promotion, provides relevant information concerning the proper way of consuming food products and the correct portion size (Consumers Goods Forum, 2011), thus simplifying purchase decision-making. This in turn influences actual purchase behavior. Past research explored the interaction between packaging features and purchase intention in different contexts. According to Quazi (2008), there is a positive correlation between packaging and consumers' purchase choices. Similarly, Younus et al. (2015) suggest product package has a significant positive relation with purchase intention. Starting from defining packaging as "a wrapping of product that holds the information regarding product and the manufacturer of a product", Kalam (2018) stresses the idea that package becomes an ultimate selling proposition which in turn leads to impulsive buying behavior. The key role of packaging in selling process, especially at point of purchase, was anticipated by Rettie & Brewer (2000). In fact, it leads consumers to properly choose the product from a wide range of similar products (Wells, Farley & Armstrong, 2007). It has been also explored the significant and positive effect of utilitarian and hedonic benefits of food packaging on perceived food quality and purchase intention (Wang, 2015). Kawa et al. (2013) demonstrated a significant impact of packaging on customer's purchase intention in cosmetic industry. In the same sector, Khraim (2011) demonstrate that packaging has an impact on brand loyalty which in turn influences customers' purchase intention. Mueller & Lockshin (2008) analysed a powerful relation between wine packaging, consumers' purchase intention and brand experience.

Moreover, a conspicuous number of research has explored the effects of specific packaging features, such as design, materials, shape, size and colours, on consumers' willingness to buy. In this regard, different research focused on the central role of packaging material and packaging design in influencing consumers' purchase intention (Deliya & Parmar, 2012; Deng, 2009; Holt, Quelch & Taylor, 2004). Furthermore, for what concerns packaging size and shape, it has been explored as larger packages convey better quality (Smith & Taylor, 2004) and positively influence impulsive consumption (Keller, 2009). Moreover, Silayoi & Speece (2004) illustrates that, for the majority of consumers, the packaging shape may influence purchase intention due to a perceived greater or fewer easiness to use or consume.

In a nutshell, academic research indicates products' package plays a crucial role for companies in marketing communications and for consumers in influencing and directing their willingness to buy a certain product. However, few research has been conducted on how consumers could react in terms of purchase intention to overpackaging and why, especially in the food sector, which is the central topic of this research. Answering to such question means exploring a potential trade-off related to food quantity, by taking into account both environmental and health issues, and consumers' priorities.

In this context, Hoek et al. (2017) conducted a qualitative study into consumers' perceptions, experiences and attitudes to explore which actions lead consumers to adopt concurrently healthy and environmentally friendly food behaviors. Specifically, the researchers considered four target behaviors – reducing overconsumption of food, reducing consumption of low-nutrient energy dense foods, eating less animal and more plant-based foods, and reducing food waste – and explored food choices according to consumers' level of involvement with health and environmental issues. Results indicated consumers give priority to health issues with respect to environmental ones. Moreover, they have the highest motivation for reducing packaged food consumption in order to avoid excessive packaging and diminish food chemical intake. Furthermore, individuals have positive attitudes also for what concern reducing food waste and overconsumption. In light of this, the concept of overpackaging ties such topics with a red thread. Such concept has not been deepened widely in the literature. Elgaaïed-Gambier (2014) clarifies the notion of overpackaging by focusing on the prefix "over-", which commonly refers to "something excessive or superior to what is necessary". In this regard, it "describes products that are wrapped in more material than is needed or is wanted." Part of the literature suggests that overpackaging function does not involve containing product nor grouping purpose (Monnot et al., 2015; Elgaaïed-Gambier, 2014; Monnot and Reniou 2012). These researchers indicate that the aim of this type of packaging relates more to marketing than technical requirements.

However, this research considers the concept of overpackaging from a broader eco-friendly point of view. In fact, the above-mentioned packaging intrinsic nature of waste after consumption implies the idea that packaging can be considered excessive in both cases in which has a grouping function or a marketing function. De facto, the first has also a consistent ecological footprint, which could be avoided in some cases.

In this regard, it makes sense to explore whether and in which direction overpackaging could influence consumers' buying behavior depending on their priorities concerning the health and the environment.

Several academic research studied the effects in consumers' behavior of different food portion sizes and package sizes and also the variables that influence food choices, which in turn have consequences on the health and the environment. In this regard, there has been and still there is need to deepen what lead consumers to engage with specific food choices, and specifically why consumers buy a package containing micro-packages or a single package containing unwrapped food products. Such questions are of rising importance because imply consequences for both health and environment, which are anyway still unexplored at the moment. Some research have worked in this perspective. According to Kotler et al. (2017), larger sizes packages positively influence consumption or frequency of use of a product. Especially in the food sector, according to Wansink (1996), considering equal caloric intake in one large package and multiple smaller packages, individuals will eat more from the large package. Geier, Rozin, and Doros (2006) explored consumers' trend to consume a higher number of total calories when eating larger-sized food morsels as compared to smaller-sized food because of "unit bias" heuristic. Scott et al. (2008) focused on whether consumers are able to effectively reduce consumption when eating from little packages rather than large packages. In contrast to previous research, the study suggests that, under certain conditions, small packages can paradoxically increase consumption. In fact,

those individuals who are restrained by a diet overconsume food in small packages due to a lapse in self-control and the misperception of caloric content. According to Kleef et al. (2014), consumers behave impulsively and consume more than needed especially when deal with several smaller units of food compared to a large one. In this regard, consumer coherently are more willing to purchase a product if it is presented in smaller packages and, especially when characterized by a shorter expiry date, consumers do not prefer large package sizes (Ahmadi et al., 2013). In this regard, unit size effect biases perception of food quantity and thus consumers' impulsiveness. On this line, Argo & White (2012) suggested that small packages act as an external source of control. It means assuming that, considering the same food caloric intake, small packages will be more effective than a single larger package at managing consumers' food intake, as they comprise less product and thus fewer calories per portion than a single larger package. However, researchers argue that the potential portion control of smaller packaging manages food consumption only if a single small package is available. Often, small packages are sold in bundle or are wrapped in larger containers. Such aspect may limit the effectiveness of smaller packages in managing calories intake. In this regard, Cutler et al. (2003) argued there is a correlation between the food intake and the easiness with which food is gained. Also, Wansink (2004) demonstrated that effort is a key factor in influencing food intake. In addition, Brunner (2013) demonstrated that the level of effort influences food consumption and buying behavior. Specifically, considering snacking behavior, unwrapping a food product or catching it with sugar tongs significantly affects consumption. This is in line with the aforementioned idea by Reisch & Gwozdz (2011), according to which healthy eating can be encouraged by making "the healthy choice the easy choice". In this regard, packaging in smaller units or units containing several wrapped portion sizes is suggested as a mean to discourage unhealthy consumption.

To sum up, the bibliography of the last decades, in addition with data presented in the first chapter concerning packaging and food choices, seem to suggest a significant impact of packaging type on purchase intention. However, such relationship has not been explored yet. More precisely, it is not clear which type of packaging – either more small packages wrapped in a larger one or a single package containing unwrapped food products – influences more purchase intention and why. Consequently, such interaction will be the focus of the research. In order to explore the topic, it is relevant focusing on the fact that the recent literature concerning packaging role in food consumption and buying behavior provides insights which suggest the central role of self-control and health consciousness for the topic at hand. For this reason, it follows an in-depth analysis of literature concerning the role of self-control and health consciousness in food choices. This will be functional for the development of hypotheses, which will be then tested in the final part of the research.

2.2 The role of self-control in reducing overpackaging of food products

Self-control is a relevant topic in consumers' behavior research, especially for what concerns consumers' food choices. Several research have conceptualized and defined self-control in the last decades, in order to provide new insights about its role in food consumption. Specifically, self-control has been narrowly studied in relation to the theme of overeating. Mischel et al., (1989) refer to self-control as the preference for larger, but delayed,

rewards (e.g. weight loss) over smaller, but immediate, rewards (e.g. eating chocolate). According to Hofmann et al. (2013), self-control is "the ability to override or change one's inner responses, as well as to interrupt undesired behavioural tendencies (such as impulses) and refrain from acting on them". Similarly, Salmon et al. (2014) conceptualize it as the capability to change or eliminate impulsive responses and regulate both thoughts and behavior. Moreover, by reviewing previous research in food consumption involving psychology, consumer behavior and management, Vosgerau et al. (2019) recognized self-control has been often described as the abstinence from hedonic consumption. Specifically, they define it as "the sacrifice of immediate, short-term gratification in service of more important, long-term benefits." In this regard, most of the research characterize self-control on the idea of opposite preferences, for example about choices involving vice or virtues, present or future.

There is reason to say self-control has a significant impact on consumers' healthiness due to its role in influencing food choices (Ridder et al., 2013; Hagger et al., 2009). In this regard, it is narrowly related with the topic of overconsumption. On this line, research focused on the role of self-control as a mean to pursue healthy objectives in food choices. Consequently, several research involving consumers' health behavior suggest that a high level of self-control is needed for making healthy food decisions (e.g., Hofmann, Friese, & Wiers, 2008; Schwarzer, 2008). On this line, exerting self-control in food choices requires consumers to value healthy food positively (Hare et al., 2009). According to Georgii et al. (2019), individuals' food temptations continuously clash with a healthy eating style, whose adoption is increasingly suggested by nutritionists. In fact, consumers' capability to manage their impulses and achieve long-term goals is crucial in health and well-being (Ridder et al., 2011). However, not only individuals have a limited resource for exerting self-control (Baumeister et al., 2007), but in addition food choices are frequently made mindlessly and impulsively, thus in conditions of low self-control (Wansink & Sobal, 2007). Several research focused on these aspects. Specifically, according to Gillebaart et al. (2015) self-control successes imply future self-control failures. In this regard, the difficulty of resisting temptations negatively affects consumers' ability to exert self-control in future situations. For this reason, the researchers study the effects of trait self-control in food choices, which consider a stable part of personality, which seems to predict behavioural outcomes such as health and well-being. More precisely, they suggest consumers characterized by higher trait self-control are more able to inhibit indulgent and impulsive consumption. In fact, consumers with a higher trait self-control are intrinsically able to exert self-control in subsequent instances. In addition, according to Redden & Haws (2013) consumers higher in trait self-control show satiation faster when dealing with unhealthy foods than healthy foods. In studying the dynamics of self-control in binary food choices, Georgii et al. (2019) demonstrated individuals with dietary restraints were less likely to consume more high-calorie foods and evidenced less self-control conflicts when eating healthier foods. Moreover, Hofmann et all (2013) developed a self-control framework with the aim of exploring differences between unrestrained and restrained eaters for what concerns self-regulation of food desires. Results showed no links between consumers' dietary restraints and desire frequency, while there is significant motivation to exert

self-control with regard to food desires. Despite evidences about positive consequences of self-control on consumers' healthiness, there are also criticisms apparently resulting from a lapse self-control.

In this regard, the high rate of overweight people around the world (Schienkiewitz, Mensink, Kuhnert, & Lange, 2017; Gerrits et al. 2010) and the low success in the long-term of weight-loss diets (Mann et al., 2007) indicate failures in exerting self-control, especially in cases of individuals following a strict dietary pattern. According to Swinburn et al., (1999) individuals in developed countries live in "obesogenic environments", characterized by an increasing number of affordable foods which are high in energy and insufficient in nutrients. This is leading to increasing rates of obesity. In fact, it has been documented consumers' time-inconsistency of preferences and relative self-control problems cause obesity issues (Fan & Jin, 2013). From this point of view, according to Salmon et al. (2014), continuously exerting self-control will deplete the resource, which in turn will generate ego-depletion. Such state of mind is characterized by a reduced self-control capacity and makes conscious food consumption more difficult. For this reason, people experiencing ego-depletion tend to behave in an unreasonable and impulsive way (Hagger et al., 2013), thus making fewer healthy choices (Samon et al., 2014). This is in line to what has been previously documented about the minor desire to engage with healthy behaviours under conditions of lower self-control (Wills et al., 2007; Bagozzi et al., 2004). Therefore, such research evidence that pursuing healthiness means also being able to manage impulsive responses regarding food choice, especially in a context in which it is easy to access to and consume high-energy low-nutrient foods and snacks – which is the environment we live in. In this regard, Redden & Haws (2013) suggested that individuals with stronger self-control give more attention to the quantity of unhealthy foods consumed, which consequently contribute to a faster satiation while eating a single snack. However, unhealthy snacking is being increasingly perceived as a major public health interest, especially considering the increasing rate of snack consumption among younger individuals in developed countries (Zizza, et al., 2001). Snacking is generally considered an impulsive act which may derive for example from hunger, emotions, social cues, or habits. In particular, Rook (1987) defined impulsive buying as follows: "Impulse buying occurs when a consumer experiences a sudden, often powerful and persistent urge to buy something immediately. The impulse to buy is hedonically complex and may stimulate emotional conflict. Also, impulse buying is prone to occur with diminished regard for its consequences". Nevertheless, Honkanen et al., (2012) propose snacking behavior may be either reflective or impulsive. Moreover, they demonstrate food-related self-control influences the interaction between both attitudes and impulses and unhealthy snacking. More precisely, results evidence that both attitudes towards unhealthy snacking and impulsive snack buying were positively related to snack consumption. The effect of attitude on consumption was amplified in cases of high food related self-control, while the effect of impulsive snack buying on consumption was magnified when food related self-control was weak. Such findings indicate that while low self-control induces individuals to be more impulsive in purchasing, strong self-control does not definitely lead to less unhealthy snacking, because such food consumption behavior depends on consumers' attitudes and priorities.

Considering the literature, it is clear as self-control is functional in managing consumers' food consumption. However, self-control potential failures led marketers to come up with new strategies over the years which may help consumers to increase self-control and manage consumption. In this regard, companies are facing the issue of overconsumption by offering different packs in terms of types and sizes which can successfully satisfy consumers' needs and desires, depending on relative priorities. For this reason, companies tend to offer a significant number of different solutions, from minipacks, aimed at making consumers able to better control food consumption, to larger packs. Consequently, types of packaging could induce individuals to change more easily their food consumption behavior. For this reason, it can be considered a nudge, which has been defined as "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options, or significantly changing their economic consequences. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates (Thaler & Sunstein, 2009)."

Notwithstanding, it has been previously argued that choices of different packaging type have also a diverse ecological footprint. In this regard, individuals' capacity to exert self-control indirectly influences the environmental degradation. Considering recent trends and the above-mentioned literature, it can be definitely argued that the potential trade-off between healthiness and sustainability, which arises from different food consumption and buying choices, depends on level of relevance and priority that individuals give to such aspects.

For this reason, it follows a review of literature concerning health consciousness and environmental knowledge and concern to better understand the respective role in food choices.

2.3 The relevance of health consciousness in consumers' decision-making process

Consumers are strongly interested in food and health issues (Rozin et al., 1999). Especially in developed countries, consumers' health concern is increasingly growing concurrently with the increasing availability of health information (Kearney, 2010) the rising per capita income and the easier access to food (FAO, 2009). In this regard, consumers consider health one the most important drivers in purchasing decision-making process (IFIC, 2019; Wandel & Bugge, 1997). For this reason, it is appropriate to investigate recent literature in order to predict what role health consciousness could have in influencing consumers' health attitudes and behaviours. Past research have shown that health consciousness has great power in indicating health-related attitudes and behaviours (12th IPRRC Conference, 2009). According to Jayanti & Burns (1998), health consciousness is "the degree to which health concerns are integrated into person's daily activities". A decade later, it has been indicated as the individuals' inclination toward overall health, rather than toward a specific health issue (12th IPRRC Conference, 2009). Similarly, Petit et al (2016) recently define it as "the degree to which people are interested in their health and motivated to engage in precautionary behaviors and healthcare strategies". In this regard, it has been defined as a measure of readiness to engage with health behaviors (Abraham & Sheeran, 2001; Becker et al., 1977). Hare et al. (2011) suggest that making people more conscious about the food healthiness related to food choices facilitates individuals in exerting self-control. In fact, health-conscious

consumers are strongly concerned about their own well-being and for this reason are motivated to raise their quality of life by focusing on healthiness, in order to prevent health illnesses (Michaelidou & Hassan, 2008). Recent literature has studied the role of health consciousness in food consumption behavior. Specifically, its role has been considered in predicting attitudes and in influencing purchase intention, especially in case of organic food choices. In this regard, Paul & Rana (2012) demonstrated the higher attitudes involving organic food purchase intention of those consumers highly interested in health issues. Several research demonstrated the key influence of health concern on consumers' purchase intention (Magnusson et al., 2003; Zanoli & Naspetti, 2002). In particular, Yadav & Pathak (2016) include health consciousness in the Theory of Planned Behavior and demonstrated it has a positive influence on both purchase intention and consumers' attitudes also in developing countries. Similarly, Michaelidou & Hassan (2008) demonstrate the higher influence of health consciousness on attitude toward organic foods, which in turns affects purchase intention. However, in contrast with other research, they indicate health consciousness is the least important predictor of attitude in comparison with food safety and ethical self-identity. Sun (2008), in studying the antecedents of attitudes, recognized the key role of health concern, intended as concern of diseases and concern of consuming too many calories. In details, the researcher demonstrated the greater effect of the latter on healthy eating attitudes with respect to the first one. For this reason, consumers with a higher health concern of consuming too many calories from food are characterized by more cautious attitudes with respect to those of individuals who clearly show higher concern for progressive diseases. In this regard, health concern of consuming too many calories from food had the more consistent influence on weight control motives, followed by the health motive. In the contrast, health concern of diseases had the higher impact on food choice motives of health and ethical concern. Petit et al (2016), in studying the interaction between health and pleasure in consumers' dietary food choices, start from the assumption that increasing health consciousness positively influences one's interest in health-related information.

In summary, recent literature and report consider health consciousness a principal driver of consumers' attitudes and behaviours all over the world. Specifically, it influences individuals' self-control and buying decision-making process, thus leading companies to adopt specific health-oriented marketing strategies to boost willingness to buy their food products. In this regard, the rising health consciousness of consumers is leading them to give more attention to packaging types, as previously evidenced, and labels (Coulson, 2000), which are functional to guide them toward a judicious food purchasing and consumption based on their priorities and values. So, consumers' level of health consciousness needs to be taken into consideration for the development of a conceptual framework aimed at deepening the potential trade-off between healthiness and sustainability stemming from buying different packaging types.

2.4 The moderating effect of environmental concern on purchase intention of food packaged products

In the last years, a huge number of reports, research and publications focused on the harm that human race is causing to the environment (Haytko & Matulich, 2008) In fact, on a global scale, nature is declining at rates novel in human history (IPBES, 2019). There are lots of evidences of the growing environmental degradation, such as the increase of greenhouse gasses emissions with the consequent global warming, growth of endangered animal species, plastic waste in the oceans, melting glaciers, dying reefs, contaminated rivers. The greater information availability typical of the modern society due to mass media and social media, the wider access to others' personal experiences and the continuous and consistent educational programs is leading people to become increasingly aware of the ecological crisis. This turns into a global rise in environmental concern and eco-consciousness. In this regard, the previously analysed global rise in environmental concern already characterizes individuals worldwide and will deeply and progressively become the most distinctive features of next generations. However, the current global response to environmental issues is still insufficient, even if rising environmental concern has already brought changes in consumer demands and behavior (Mendleson and Polonsky, 1995). For this reason, the aim of governments, institutions, organizations, researchers, and companies is firstly to sensitize consumers always more about their role in preventing environmental degradation and secondly to develop coherent and efficient eco-friendly strategies. In fact, individuals' environmental concern has a direct relationship with the environmentally friendly behavior (*Bamberg 2003; Fransson & Gärling, 1999*; Hines et al, 1987). Consequently, those individuals highly involved with a specific theme subsequently act in a coherent way. In fact, it has been recognized it is a key factor in consumer decision-making process (Diamantopoulos et al., 2003). For this reason, the literature has given increasing importance to environmental issues and their potential remedies. Since the entire food sector significantly affects the environment in several ways, researchers have deepened and continue to explore the role of environmental concern in influencing consumers food choices. On this line, Bech-Larsen (1996) showed that the environmental buying objectives of consumers can be influenced by a variety of factors. Environmental concern has been defined as a consumers' attitude towards sustainability (Bickart & Ruth, 2012; Kilbourne & Pickett, 2008; Crosby et al., 1981). So, it refers to individuals' awareness of ecological problems, their support of efforts to solve them and their personal willingness to strive for contributing to their solution (Prakash & Pathak, 2017; Dunlap & Jones, 2002). In this regard, environmental concern is different from environmental knowledge, which refers to the consumers' awareness concerning the effective impact that their behaviours and actions have on the environment. In this regard, Fryxell and Lo (2003) defined environmental knowledge as "people knowledge about environment, key relationship leading to environmental impact and collective responsibilities of individual necessary for sustainable development". Consequently, it leads people to behave in an eco-friendlier way (Peattie, 2010). It means that environmental knowledge changes consumers' attitude and buying behavior (Scott & Vigar-Ellis, 2014; Aman et al., 2012). In this direction, Wang et al. (2014) demonstrated a significant positive impact of environmental knowledge on consumers' purchase intention of ecological

products. Moreover, Mostafa (2009) similarly recognized the key role of environmental knowledge in affecting consumers' intention and behavior of buying green products.

However, this research focuses on environmental concern rather than knowledge because it is assumed that the consciousness of an existing trade-off which influences packaging purchase intention depends mostly on the consumers' attitude toward the environment rather than on the real consciousness of the impact that packaging would have on the environment. In fact, the direct impact of environmental concern on attitude and purchase intention has been widely explored in the literature. Pickett-Baker & Ozaki (2008) pointed out that consumers' environmental concern influences pro-environmental buying behavior. Several research include environmental concern as additional construct in the Theory of Planned Behavior (TPB), which has been successfully applied also in the food context (Dowd & Burke, 2013; Zagata, 2012; Smith & Paladino, 2010; Arvola et al., 2008). Such framework suggests that attitude toward the behavior, subjective norms, and perceived behavioural control concurrently result in a behavioural intention, which in turn influence the behavior (Ajzen, 1985). More precisely, the first refers to the "degree to which a person has a favourable or unfavourable evaluation or appraisal of the behavior in the question", and it is considered the most important predictor of behavioral intention (Kotchen & Reiling, 2000); the second is defined as the "perceived social pressure to perform or not perform the behavior"; the third is "an individual perceived ease or difficulty or performing the particular behavior". Those individuals who have a higher control over them are more likely to behave in a specific way (Ajzen, 1991). For what concerns the role of the environmental concern in such conceptual framework, Paul et al. (2016) demonstrated it has a direct and positive influence on both consumers' attitude and purchase intention of green-oriented products. Yadav & Pathak (2016) confirmed the aforementioned results by focusing on Indian young consumers. Conversely, Yadav & Pathak (2016) demonstrated also that, considering the food sector, environmental concern influences attitudes, while it does not result any direct significant impact on purchase intention of food products, probably due to the significant mediation effect of consumers' attitude.

What has been discussed so far by analysing trends and research clearly reveals as environmental concern is an increasingly relevant factor affecting consumers' decision-making process. In this regard, it influences purchase intention and subsequent consumption. This is true also in the food sector, considering that activities involving production and consumption of packaged food products can potentially have significant negative consequences on the environment. In this regard, part of the literature has focused on the role of environmental concern in influencing food packaging evaluation and relative consumers' intention to buy. Bech-Larsen (1996) was among the first to consider the relevance of the environmental aspect of food packaging in influencing consumers' purchase decisions. The researcher suggested, among the others, the use of the Theory of Planned Behaviour for explaining the consumer's intention to pick out reusable packaging rather than disposable packaging. In particular, the use of a reusable packaging could be justified by "(a) his/her attitude to the relative seriousness of the latter's environmental consequences (compared with other environmental and social problems), (b) his/her perception of friends' attitudes to reusable packaging, and (c) his/her perception of the extent to which reusable packaging has a positive effect on the environment". Furthermore, also Thøgersen (1999) recognized the

positive influence of environmental concern on the choice of ecologically packaged goods. Further, Magnier & Schoormans (2015), in studying the consumers' reactions to sustainable packaging, proved that environmental concern influences consumers' responses to the visual appearance and verbal sustainability claims of package. More specifically, low ecologically concerned consumers evaluate a conventional-looking package with a verbal sustainability claim more negatively. In addition, ecologically responsible packaging has been proved to positively influence purchase intentions and brand evaluations (Rokka & Uusitalo, 2008; Birgelen et al., 2008). More precisely, Birgelen et al., (2008) analysed package-related behaviors regarding beverage consumption and demonstrated that eco-friendly intention to purchase specific packages of beverages and the relative disposal decisions are influenced by consumers' environmental concern and their eco-friendly attitude. They subsequently suggested that, from a managerial point of view, emphasizing the environmental friendliness of packaging may lead to a competitive advantage over the competitors. In fact, it was proved that only taste and price are considered of higher importance than the ecological beverage packaging characteristics. In this regard, such results are aligned with Thøgersen (1999), who suggested that being environmentally involved is not a sufficient condition to choose environmentally friendly packaging. On his opinion, another necessary condition is the shortage of other highly involving characteristics. On the same line, Koenig-Lewis et al., (2014) demonstrated that, in the context of ecologically responsible packaging, consumers' purchase intention was significantly influenced by environmental concern – confirming what has been previously suggested (Chamorro et al., 2009) – but curiously not by rational evaluation of benefits. Moreover, they showed that the assessment of environmental benefits on purchase intention had a significant influence on positive emotions, which in turn positively influence purchase intention, while there was no effect of environmental concern on negative emotions. Even Prakash & Pathak (2017) studied the willingness to buy eco-friendly packaged products, confirming that environmental concern has a key positive impact on purchase intention of ecologically responsible packages. In their opinion, the higher consumers' willingness to buy eco-friendly packaged products in cases of higher level of environmental concern reflects their commitment towards the environment. However, despite there is a number of research concerning the relation between environmental concern, packaging issues, and consumers' purchase and consumption behaviors, it is almost absent the literature which considers, in the food sector, the excess of packaging as a potential factor affecting purchase intention.

In this regard, only Elgaaïed-Gambier (2014) explored in part the topic considering in their research the awareness towards environmental issues. More precisely, they aimed at understanding who buys overpackaged product and at what level consumers' attitudes to the functional and environmental consequences of food packaging influence the willingness to buy. Their findings showed that overpackaging tends to be more attractive. Nonetheless, individuals believe it leads to more household waste, and thus it is perceived as having a negative impact on the environment. For this reason, the researchers highlighted willingness to buy overpackaged products depends on the type of consumer. Consequently, they proceed with the identification of different consumers' profiles depending on attitudes, beliefs, and behaviours. However, in the end, they recognized that, despite of consumers' efforts toward a sustainable choice entailing the purchase of non-

overpackaged food products, several deterrents might prevent them from such choice. In fact, they suggested either negative beliefs, such as low-end and lack of protection, or perceived usefulness and attractiveness may significantly affect their purchasing behavior. This is in line to what has been suggested by Eckhardt et al. (2010), according to whom "although consumers may say they have ambitions to change the marketplace through their behaviors, they are ultimately blinded by the seduction of consumer goods". In this regard, ecological considerations may not weigh as much as expected in consumers' purchasing decision-making. Moreover, they underlined that another potential barrier might derive from the unavailability of different packaging alternative to non-overpackaged ones, which is also today not offered at all, as in the past (Thøgersen, 1999).

In conclusion, research focused mainly on the direct impact of environmental concern on purchase intention, as it is increasingly crucial in influencing consumers' food choices related to purchasing and consumption. Part of environmental literature has explored the role of environmental concern in this context. However, the relation between food packaging choices and consumers' priorities has not been widely discussed, especially considering recent trends and the rising importance of topics concerning food quantity issues.

This additional evidence reveals a research gap that needs to be addressed.

Hence, starting from the research questions, in the following section the conceptual framework and the relative hypothesis of this research will be presented.

2.5 Conceptual framework and hypothesis development

Nowadays there is growing attention among consumers about the consequences that their food choices have on their health and the environment. Oftentimes, these two aspects have not been explored concurrently, thus leading to a misperception about the actual people's way of thinking and living. However, what has been previously discussed reveals a clear trend toward a deeper health and environmental concern of individuals worldwide. Moreover, there is reason to say food choices reflect individuals' lifestyle. In the last decade, there has been a tendency to focus more on food quality rather than quantity. However, the foregoing evidences suggest food quantity issues need to be further explored and addressed, because may affect both individuals' healthiness and environment.

In this regard, the literature of the last decades and the ongoing trends presented in the first two chapters concerning food buying and consumption behavior clearly reveals the need for shedding light on the role of packaging in addressing health and environmental objectives. From a health point of view, it may be useful for indicating the correct portion size and leading consumers toward a more careful and food consumption. This may be the case for example of a larger package containing more small packages, aimed at indicating the proper portion size to consume. Conversely, from an environmental point of view, the debate is more complex. The attention institutions, companies, organizations, and researchers are giving to the topic of recycling are undoubtedly extremely important to reduce the ecological footprint of packaging over time. However, it has been also discussed the fact that there is not yet possibility to recycle 100% of packaging. Such trend will

gradually change, but it is evident that the first "R" of sustainability – reduce – still has and will definitely have the highest impact on the environment in the future. In this regard, avoiding the production and the purchase of smaller wraps into a larger one, aimed at controlling food consumption, could be considered an environmentally friendly practice.

However, given the ongoing trends, no academic research has examined how excess of packaging influences willingness to buy in both healthy and environmentally concerned consumers. This is a crucial aspect to consider in discussing food quantity trade-off involving healthiness and sustainability.

Previous research seem to suggest a significant influence of packaging type on purchase intention. Notwithstanding, it is not clear which type of packaging – whether more small packages wrapped in a larger one or a single package containing unwrapped food products – influences more purchase intention and why. In this regard, in the case of food products, it is still unclear whether consumers are seriously aware of the amount of excess package while making their food purchase choice, and if they are, it is uncertain what level of priority they give to such aspect compared with health issue. Considering the above-mentioned literature, the first type of packaging implies an excess of materials used and should stimulate individuals' capacity to exert a stronger food related self-control. Thus, it is more health oriented. Instead the second type of packaging is more environmentally friendly, and it is probably more suitable for those individuals with a high food-related trait self-control.

However, considering what has been previously discussed about the fact that consumers apparently still give a higher priority to healthiness with respect to environment, there is reason to hypothesize that:

H1. *Purchase intention is more likely to be positively affected in the case of smaller packages wrapped in a larger one than in the case of a single package containing unwrapped food product.*

In addition, previous literature has clearly highlighted as environmental concern is an even more relevant factor in influencing consumers' food purchasing choices. In fact, nowadays trends suggest a rising environmental concern and eco-consciousness. Individuals are becoming more aware about the importance of the role that they themselves play in achieving sustainable objectives. Specifically, for what concerns the topic of packaging and overpackaging, individuals tend to overestimate the environmental harm associated with packaging (Tobler et al., 2011; Lea & Worsley, 2008). According to Dam (1996), a feasible explanation for this misperception might derive from the fact that consumers personally experience the post-consumption phase of packaging because they must dispose of it. This may subsequently lead to an overestimate of the relative environmental impact. In this regard, there is reason to say that consumers' willingness to buy depends on different types of packages. Hence, it is hypothesized that:

H2. *When dealing with smaller packages wrapped in a larger one, purchase intention is more likely to be higher for consumers with a lower level of environmental concern; when dealing with a single package containing unwrapped food product, purchase intention is likely to be higher for consumers with a higher level of environmental concern.*

Given the focus on the environmental variable and on the other hand the key role of health consciousness in consumers' food decision-making process, it will be set as a control variable. In this regard, it will be held constant, in order not to influence the interactions among aforementioned variables.

Figure 2.1 shows the conceptual framework on which hypotheses are based.

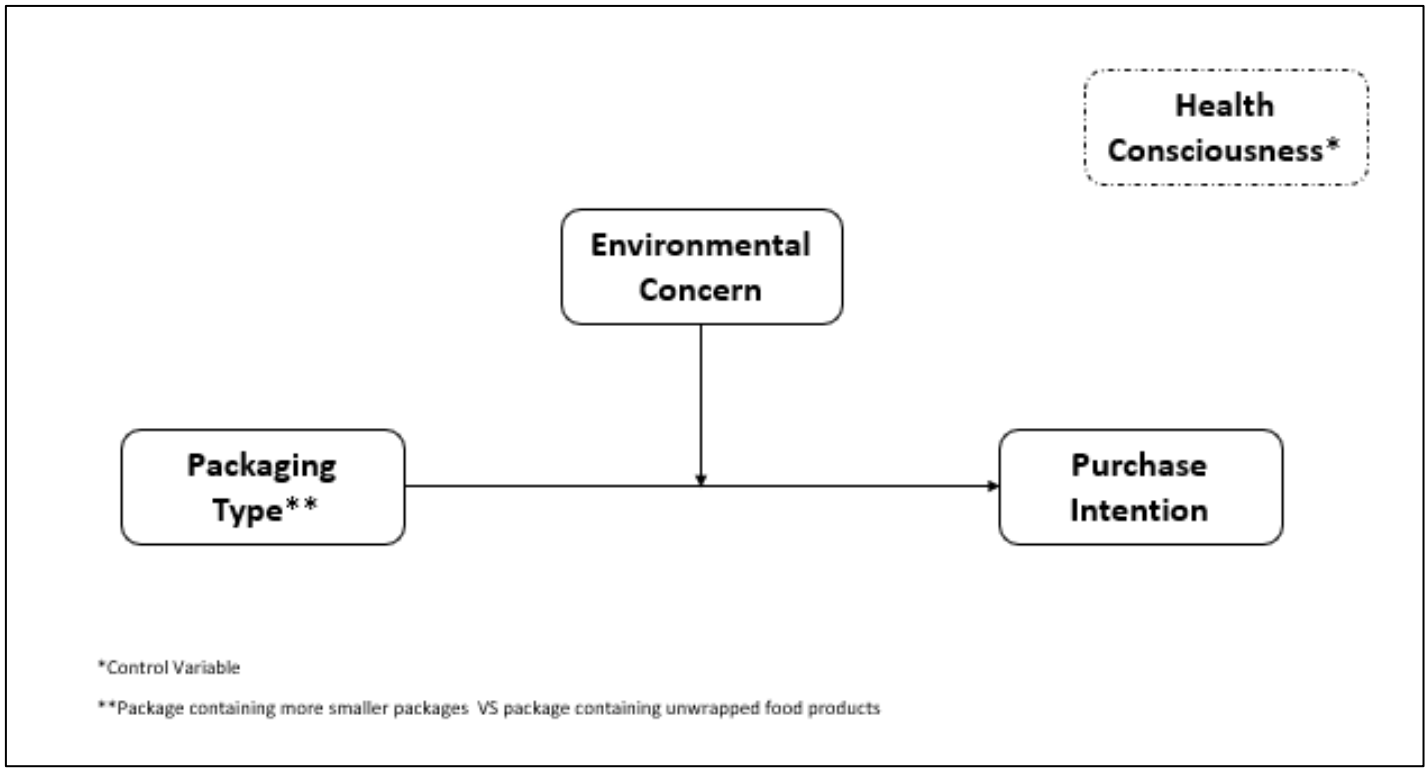

Figure 2.1: Conceptual Framework

It follows an in-depth study based on such conceptual framework, aimed at clarifying first whether and to what extent packaging types influence consumers' purchase intention of food products and second which role environmental concern has in moderating this relationship. The analysis will get new insights concerning the still unexplored trade-off between healthiness and sustainability.

3 Marketing Research Development

During this journey, it has been clearly evidenced individuals' desire to pursue concurrently health and sustainable goals. Notwithstanding, for what concerns food sector, literature exploring both the topics together is almost absent. Considering the huge impact of the entire food industry on the environment and healthiness of people, there is urgency of filling these gaps.

In particular, this research concentrates on food quantity issues, by analysing related trade-off involving healthiness and sustainability which may arise during purchasing choices.

So, the third chapter will go through the exploration of the interactions characterizing the conceptual framework developed in the second chapter. In this regard, the aim of the entire research is to answer to the following research questions:

RQ1: Does and to what extent packaging types influence willingness to buy the food products in both health- and environmentally concerned consumers?

RQ2: Does the role of environmental concern affects the form and the strength of the relationship between packaging types and purchase intention in cases of both health- and environmentally concerned consumers?

Testing the hypotheses presented in the last part of the second chapter will be functional for understanding more deeply the nature of the potential trade-off between healthiness and sustainability. In fact, it is assumed that such trade-off may arise when consumers have to deal with the choose of a food product package which can be more oriented either to achieve health objectives or to pursue sustainable goals.

Thereby, the objective of this chapter is to shed light on this aspect, by conducting an experiment made through an online questionnaire. For this reason, initially, research methodology and design will be presented and discussed. In this regard, the reader will know the microplanning of the work. Then, he/she will be conducted through the examination of choices concerning the design of the questionnaire. Then, how the variables were measured will be discussed, thus providing validate scales and items aimed at leading consumers to share their responses and thoughts on the topic clearly and efficiently. Afterwards, there will be a focus on dataset cleaning procedure involving all data collected. This will be functional to better understand and discuss the results.

Thereafter, an in-depth discussion will follow the presentation of the results, aimed at interpreting data and understanding the reasons which might explain the results. Findings of the research will give us the opportunity to comprehend in detail whether a trade-off involving healthiness and sustainability during purchasing choices exists, and which interactions characterize it. Thereby, the research will provide theoretical contributions and managerial implications concerning a topic of increasingly importance worldwide.

Then, limitations of the research will be explored and future research will be proposed.

Finally, research topic will be analysed also considering the current emergency caused by novel Coronavirus, which is having a huge impact on people's way of thinking, on their lifestyle and ultimately also on their food consumption behaviors.

3.1 Research methodology

The empirical analysis carried out in this research had a twofold objective. First, it aimed to determine whether and to what extent packaging types influence willingness to buy the food products in both health- and environmentally concerned consumers. Second, it aimed to estimate whether and how strongly the environmental concern affects the relationship between packaging type and consumers' purchase intention of food products. For this reason, experimental design was chosen, as it is widely recognized as the most appropriate for testing causal relationship (Saunders et al., 2009).

Using experimental conditions and a control variable (i.e. health consciousness), the study manipulated packaging type in consumers' food purchasing choices. Specifically, the current research conducted an online experiment in which participants have been randomly assigned to one out of three different conditions and then asked to fill out a questionnaire. The presented conceptual framework implies the use of a moderation model to analyse data.

More precisely, to test H1, packaging type was used as independent variable (X) and consumers' purchase intention as dependent variable (Y). Furthermore, to test H2, a moderation model with environmental concern as moderating variable (W) was employed (Figure 2.1). In this regard, the study used a 2 (packaging type: package containing food micro-packages versus package containing unwrapped food products) × 2 (environmental concern: high versus low) between-subjects experimental design. Packaging type is a nonmetric variable while purchase intention is a metric variable. Environmental concern and health consciousness are continuous variables which have been studied as dichotomous ones (high versus low) by using the method of Median Split.

The next section consists of an analysis of the design and development of the questionnaire.

3.2 Questionnaire design & variables' measures

The research has been conducted through an online questionnaire (see Appendix A), developed on Qualtrics XM and sent by social network (WhatsApp, Facebook, Instagram, LinkedIn) in the period between the 7th and the 25th of April 2020. The time requested to fill the questionnaire was about 4 minutes. The survey has been completely written in Italian, since the sample was 100% Italian.

The survey was divided into 8 sections/blocks, regarding respectively:

- Introduction
- Stimuli/Pictures
- Purchase Intention
- Health Consciousness
- Food-related Self control
- Environmental Concern
- Attention Check
- Socio-demographic

Specifically, the survey consisted of close ended questions, which were formulated using a simple language characterized by commonly used words. More precisely, scales and items have been selected by reviewing literature, so as to be clear, exhaustive, and mutually exclusive.

In the first section, topic was introduced to respondents. Specifically, he/she acknowledges that the research is aimed at understanding priorities which influence him/her in food purchasing choices. However, it is not yet specified what priorities research is focusing on (i.e. health and sustainability).

Afterwards, in the second section the respondent is asked to carefully observe a randomly assigned stimulus/picture (one out of three) which shows a specific type of food packaging. It has been decided to focus on packs of biscuits since the rate of snack consumption in developed countries is increasing over time. In this regard, the development of food industry concerning production and packaging of snacks has a growing impact on both health and environment. Moreover, cookies, as well as for example chips, tartlets, and pre-packed sandwiches, represent a type of food which is suitable to be consumed in different contexts and throughout the all day. In fact, these kinds of food may be consumed at school by children, during work hours, or simply at home. This type of food is easily available, fast to consume, affordable, and may satisfy both functional goals and hedonic desires. For this reason, studying the snack buying and consumption behavior is of increasing relevance for the topic at hand. However, oftentimes individuals are not care about the proper food quantity. With this in mind, food market proposes several types of packaging, in order to satisfy all the potential needs and desire. For this reason, this research proposes three different stimuli in the survey:

1. A package of cookies containing micro-packs based on the recommended portion size (Figure 3.1);
2. A package of cookies containing unwrapped food products (Figure 3.2);
3. A package of cookies containing unwrapped food products with indications concerning the proper food quantity to consume (Figure 3.3).

Figure 3.1: "package of cookies containing micro-packs based on the recommended portion size"

Figure 3.2: "package of cookies containing unwrapped food products"

Figure 3.3: "package of cookies containing unwrapped food products with indications concerning the proper food quantity to consume"

Specifically, the real difference in terms of packaging type involves only stimuli presented in Figure 3.1 and Figure 3.2. The second picture was the one defined as "control", with only essential information presented on pack. As regard to the third stimulus (Figure 3.3), the only difference with the second stimulus concerns the indication on the packaging about the recommended portion size to consume. In this regard, the idea beyond the third stimulus was to study in this context potentially relevant aspects regarding the power of pack labels in influencing consumers' buying behavior. Each of the presented picture shows a self-made unbranded packaging, so as consumers' willingness to buy not to be influenced by other variables, such as for example brand, typical colours, design, and graphics. The front-of-pack label consists only of essential information. In this regard, it comprises a picture of the specific biscuits at hand, and information concerning what is the type of food inside the package and the relative amount in terms of total weight. The final aim is to lead respondent to answer questions by focusing only on the randomly proposed type of food package. It is assumed that these stimuli should differently affect consumers' purchase intention.

The third section is aimed at analysing respondents' purchase intention of the randomly assigned food package. Specifically, all the variables of the experiment have been measured through a 7-point Likert scale. In particular, for what concerns the measurement of purchase intention, it has been measured through a 7-point Likert scale developed by Dodds et al. (1991), where 1 = totally disagree; 7 = totally agree. The scale chosen considers 7 points (Figure 3.4), because if compared to the 5 points one, it appears to be more sensitive. In this regard, it ensures a more accurate evaluation, especially in cases of online surveys.

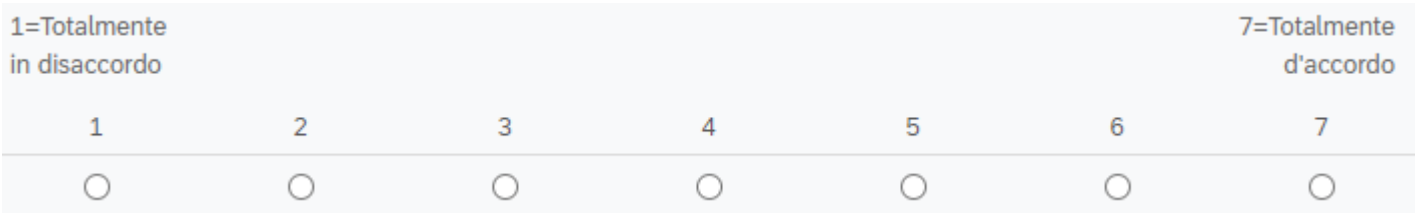

Figure 3.4: "example of a 7-point Likert Scale used in the Survey"; SOURCE: self-made; LANGUAGE: Italian

Thereafter, section 4, 5 and 6 involve the evaluation of personal health consciousness, food-related self-control, and environmental concern. However, these three sections were randomly presented to the interviewee, in order to avoid any response bias caused by the position of the relative question in the survey. Even these variables have been measured through different 7-point Likert scales (1 = totally disagree; 7 = totally agree) already used in literature.

After responding the core questions, in section 7 respondents had to deal with an attention check, aimed at evaluating their attention in filling the survey and thus the relative reliability of responses. More precisely, it was asked to respondents which type of stimulus/picture was shown at the beginning of the questionnaire.

Finally, the survey ended with a socio-demographic section, which consisted of 5 questions involving sex, age, income, level of education and professional occupation. Such information is useful for better analysing the results.

Table 3.1 reports the list of scales and items used to measure all variables included in this research, together with their source of adoption.

Table 3.1
Measurement items.

Measure	Items
Purchase Intention (Dodds et al., 1991)	I would purchase the described…
	I would consider buying the described…
	The probability that I would consider buying the described…
Environmental Concern (Haws et al., 2014)	It is important to me that the product I use do not harm the environment
	I consider the potential environmental impact of my actions when making many of my decisions
	my purchase habits are affected by my concern for our environment
	I am concerned about wasting the resources of our planet
	I would describe myself as environmentally responsible
	I am willing to be inconvenienced in order to take actions that are more environmentally friendly
Health Consciousness (Tarkiainen & Sundqvist, 2005)	I chose food carefully to ensure the food health:
	I didn't consider myself as health conscious consumer
	I think often about health related issues
Food-related Self-Control (Honkanen et al., 2012)	I have a hard time breaking bad food habits
	I wish I had more self-discipline
	Sometimes I can't stop myself from eating
Income (self-made)	Less than 15000€
	between 15000€ and 40000€
	More than 40000€
Occupation (self-made)	Student
	Freelance
	Employee
	Unemployee
	Other
Education (self-made)	High School Diploma
	Bachelor Degree
	Master Degree
	Other

Table 3.1: "Measurement items."

3.3 Dataset cleaning procedure

Initially, dataset consisted of a total of 411 replies, received in the period between the 7th and the 25th of April 2020. Before to analyse the results and discuss the findings, there has been a proper data cleaning in order to increase quality of data and consequently also the relative interpretation. In fact, the objective was to avoid miscomprehension, redundancies, and errors, so as to increase data reliability and validity and ensure consistency in the data and thus in the subsequent analysis.

For this reason, responses of those individuals who failed attention check were not considered. In fact, such answers cannot be considered reliable and may contribute to misperception of data. Moreover, the study did not consider all the replies whose response time was not reasonable. In this regard, replies given either in less than 2 minutes or in more than 15 minutes were not taken into consideration. In fact, answering the questionnaire too quickly means not thinking carefully about the questions that are presented. At the same time, filling the survey too slowly may imply that the respondent interrupted the compilation and then resumed it at a later time. This may affect the reliability and consistency of data, as individuals' way of thinking, responding, and acting strongly depends on personal mood and on the context in which responses are given, which can be different at a later moment.

In the end, after data cleaning, final dataset consisted of 269 responses.

Afterwards, several steps were addressed in order to run a two-way ANOVA to examine the effect of packaging type on purchase intention and the moderating effect of environmental concern, while controlling health consciousness.

First, packaging type was coded as:

- 1 = Package of cookies containing micro-packs based on the recommended portion size (Figure 3.1);
- 2 = Package of cookies containing unwrapped food products (Figure 3.2);
- 3 = Package of cookies containing unwrapped food products with indications concerning the proper food quantity to consume (Figure 3.3).

Second, for what concerns scale of health consciousness, an item (the second one) was reversed scored with the aim to be consistent with the direction throughout the whole scale.

Third, environmental concern and health consciousness have been studied as dichotomous variables (coded as 1 = high and 0 = low) by using the method of Median Split. Such method is used for turning a continuous variable into a categorical one. In this regard, the idea is to find the median of the continuous variable. Considering the range of values from 1 to 7, $MED_{HealthConsciousness}$ = 5,3 and $MED_{EnvironmentalConcern}$ = 5,3. Therefore, all values below the median are put it the category "Low" and all values above it are labelled "High."

3.4 Results

Results were analysed using IBM SPSS Statistics (Statistical Package for Social Science).

However, to test hypotheses, the analysis of results concerns only the responses based on the first and second stimuli (i.e. *Package of cookies containing micro-packs based on the recommended portion size* versus p*ackage of cookies containing unwrapped food products*), for the following reason. Considering in the analysis all the responses related to all the three stimuli presented in the questionnaire affected the results, thus reducing the explanatory power of the conceptual framework. In this regard, interactions were not significant. This may be due to the consumers' perception of deep similarity concerning the stimuli, especially between the second and the third one (i.e. p*ackage of cookies containing unwrapped food products* and *package of cookies containing unwrapped food products with indications concerning the proper food quantity to consume*). In fact, the real difference in packaging type involves only the first two stimuli (see Figure 3.1 and Figure 3.2), because the third one (see Figure 3.3) differs from the second only for the specific information on the pack regarding the proper food quantity of product to consume.

So, by focusing only on replies based on the first two stimuli, the present study provides new insights about a topic not yet explored. Thus, the following subsections will provide information involving the final sample considered for testing the hypotheses.

The first subsection will provide insights based on socio-demographic characteristics of the respondents. In this regard, they will be profiled by gender, age, annual income, professional occupation, and education. These details are useful firstly for better understanding why individuals responded in a certain way and then for determining potential sampling errors. In fact, findings based on a subsample do not always represent the results that would be obtained by focusing on the entire population.

The second subsection will deepen the reliability for each construct. It essentially means measuring the overall consistency of each measure and understanding whether it produces similar results under consistent and different conditions. For this reason, scores that are strongly reliable are accurate, reproducible, and consistent in different testing occasions.

The third subsection will concentrate on hypotheses testing. Therefore, an in-depth and analytical analysis of the form and strength of interactions between variables will be provided, in order to test whether aforementioned hypotheses are supported or not supported.

3.4.1 Sample description

After dataset cleaning, the final sample consisted of 189 participants (66 male, 123 female, M_{age} = 33.70, SD_{age} = 14,51), 61% with low annual income (below 15000€), 34% with average annual income (between 15000€ and 40000€), and 5% with high annual income (above 40000€).

In this regard, figure 3.5 shows that 65% of sample consists of female (i.e. 123 respondents), while the remaining 34% consists of male (i.e. 66 respondents). Moreover, about 70% of sample is under 40 years old.

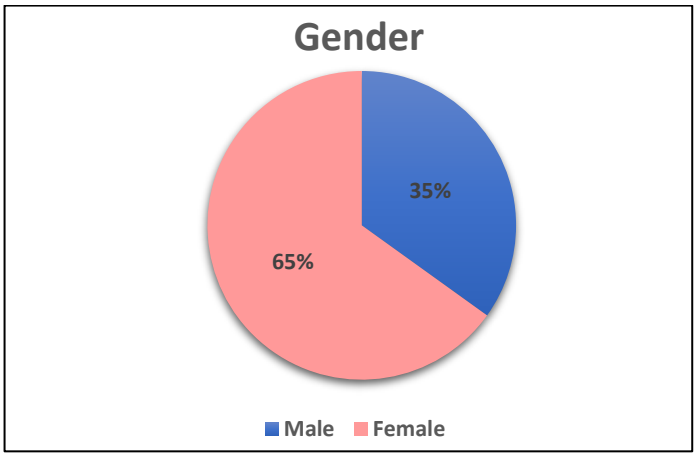

Figure 3.6: Gender", SOURCE: self-made

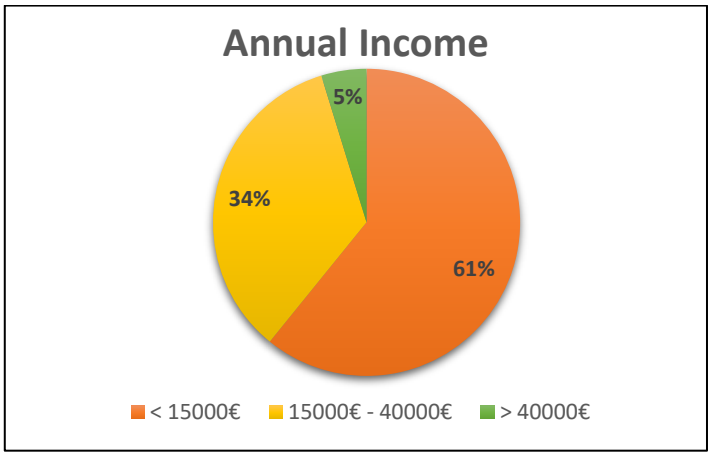

Figure 3.5: "Professional Occupation", SOURCE: self-made

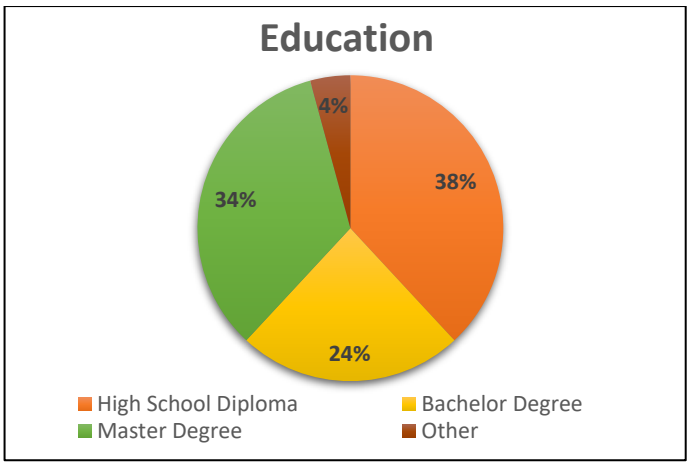

Figure 3.7: "Annual Income", SOURCE: self-made

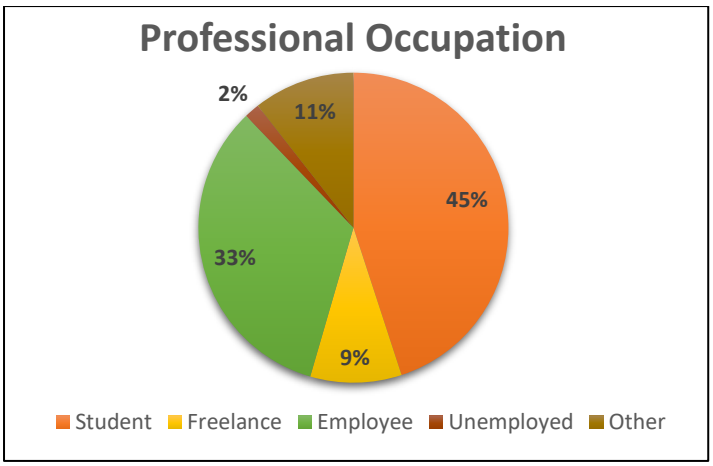

Figure 3.8: "Education", SOURCE: self-made

However, the older respondent is 68 years old. In fact, the higher standard deviation reveals a quite consistent spread in the sample in terms of age. It means that data points involving age are farther from the mean. Furthermore, sample is characterized by a good level of education, as almost 60% of respondents has a bachelor's or master's degree (Figure 3.7). This is crucial for consumers in fostering consciousness and willingness to know actual relevant issues and topics. In this regard, given the level of education, it is not surprising the high average value of both environmental concern and health consciousness ($M_{EnvironmentalConcern}$ = 5.26, $M_{HealthConsciousness}$ = 5.28). These values indicate that individuals' health concerns are essentially at the core of their daily routines and thus influence their behaviours. Moreover, they have a quite strong attitude towards sustainability, which is generally assumed to be a good driver for achieving eco-friendly objectives. There is a good level of heterogeneity in terms of professional occupation, despite 45% of interviewees is still a student. This in part explains the significant percentage of people in the sample with a low level of annual income. Only 2% of respondents is unemployed.

In summary, the profile of respondents is predominantly female, young, and highly educated. Thus, it is characterized by high concern toward both health- and environmental issues.

Table 3.2 indicates all information concerning respondents' profile.

Table 3.2	
Respondents' profile.	
	Mean (SD)
Age	33,7 (14,51)
Environmental Concern	5.26 (1,15)
Health Consciousness	5.28 (1.2)
Food-related Self-Control	4.01 (1,58)
Average Purchase Intention	3,96 (1.71)
Purchase Intention (Condition 1)	4,18 (1.63)
Purchase Intention (Condition 2)	3.65 (1.81)
	N
Gender	
Male	66
Female	123
Annual Income	
< 15000€	115
15000€ - 40000€	65
> 40000€	9
Professional Occupation	
Student	85
Freelance	18
Employee	63
Unemployed	3
Other	20
Education	
High School Diploma	72
Bachelor Degree	45
Master Degree	64
Other	8
Condition 1 (Package of cookies containing micro-packs based on the recommended portion size)	110
Condition 2 (Package of cookies containing unwrapped food product)	78

Table 3.2: "Respondents' Profile".

3.4.2 Reliability & validity

To test reliability, Cronbach's alpha (α) has been analysed for each scale. For this reason, a preliminary analysis has been conducted on scales concerning purchase intention, environmental concern, health consciousness and food-related self-control. Results suggested each scale is reliable, meaning that they are accurate, consistent, and reproducible. For this reason, each scale is functional for coherently evaluating the attitude of respondents toward all variable.

Specifically, Figure 3.9 indicates reliability statistics concerning the three items of scale for measuring consumers' purchase intention. The relative Cronbach's alpha is excellent in terms of internal consistency (α = 0,942).

Reliability Statistics

Cronbach's Alpha	N of Items
,942	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PURCHASEINTENTION1	7,91	11,967	,866	,926
PURCHASEINTENTION2	7,72	11,726	,889	,908
PURCHASEINTENTION3	7,99	11,443	,884	,913

Figure 3.9: "OUTPUT SPSS: Cronbach's Alpha for Purchase Intention scale"

Figure 3.10 points out reliability statistics involving the six items of scale for measuring consumers' environmental concern. The relative Cronbach's alpha is excellent in terms of internal consistency (α = 0,92).

Reliability Statistics

Cronbach's Alpha	N of Items
,920	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ENVIRONMENTALCONCERN1	26,03	36,816	,760	,907
ENVIRONMENTALCONCERN2	26,48	35,527	,809	,900
ENVIRONMENTALCONCERN3	26,92	34,893	,810	,900
ENVIRONMENTALCONCERN4	25,68	38,008	,765	,906
ENVIRONMENTALCONCERN5	26,25	38,180	,788	,904
ENVIRONMENTALCONCERN6	25,52	39,892	,711	,914

Figure 3.10: "OUTPUT SPSS: Cronbach's Alpha for Environmental Concern scale"

Figure 3.11 specifies reliability statistics concerning the three items of scale for measuring consumers' health consciousness. The relative Cronbach's alpha is acceptable in terms of internal consistency (α = 0,705).

Reliability Statistics

Cronbach's Alpha	N of Items
,705	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
HEALTHCONSCIOUSNESS1	10,28	6,446	,650	,470
HEALTHCONSCIOUSNESS2	10,14	6,465	,502	,640
HEALTHCONSCIOUSNESS3	10,79	6,675	,435	,728

Figure 3.11: "OUTPUT SPSS: Cronbach's Alpha for Health Consciousness scale"

Figure 3.12 shows reliability statistics concerning the three items of scale for measuring consumers' food-related self-control. The relative Cronbach's alpha is good in terms of internal consistency (α = 0,780).

Reliability Statistics

Cronbach's Alpha	N of Items
,780	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SELFCONTROL1	8,18	11,903	,624	,698
SELFCONTROL2	7,30	10,750	,632	,686
SELFCONTROL3	8,38	10,997	,599	,723

Figure 3.12: "OUTPUT SPSS: Cronbach's Alpha for food-related self-control scale"

In summary, all items of the scales have been considered, as no deletion of any item would have increased the reliability of scales at hand.

3.4.3 Hypotheses testing

A two-way ANOVA (Analysis of Variance) has been used to measure interaction between variables and test hypotheses H1 and H2. Health consciousness has been used as control variable.

Results are presented in figure 3.13.

Tests of Between-Subjects Effects

Dependent Variable: PI_mean

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	19,408[a]	4	4,852	1,663	,160	,035	6,654	,505
Intercept	1128,977	1	1128,977	387,038	,000	,679	387,038	1,000
HC_Dico	2,394	1	2,394	,821	,366	,004	,821	,147
STIM_1_2	12,965	1	12,965	4,445	,036	,024	4,445	,555
EC_Dico	2,815	1	2,815	,965	,327	,005	,965	,165
STIM_1_2 * EC_Dico	3,060	1	3,060	1,049	,307	,006	1,049	,175
Error	533,805	183	2,917					
Total	3502,833	188						
Corrected Total	553,214	187						

a. R Squared = ,035 (Adjusted R Squared = ,014)

b. Computed using alpha = ,05

Figure 3.13: "SPSS OUTPUT: Two-way Anova_Tests of Between-Subjects Effects – HC_Dico: control variable – STIM_1_2: independent variable – EC_Dico: moderating variable"

H1 aims at measuring whether exists an interaction between packaging type and consumers' willingness to buy. More precisely, it is assumed purchase intention is more likely to be positively affected in the case of smaller packages wrapped in a larger one than in the case of a single package containing unwrapped food product. Test of between-subjects effects reveals a significant interaction for what concern main effect ($F = 4.45$, $p < 0.05$, see Figure 3.13), which confirms packaging type influences consumers' purchase intention. In particular, for the same amount of food product, consumer are more willing to buy a package containing smaller packages ($M_{PurchaseIntention\ (1)} = 4.18$) rather than a single package containing unwrapped food product ($M_{PurchaseIntention\ (2)} = 3.65$) (see Table 3.2). Thus, H1 is supported.

Instead, environmental concern does not significantly affect directly purchase intention (F = 0.965, p > 0.05, see Figure 3.13). In addition, it does not have a moderating effect on the relationship between packaging type and purchase intention (F = 1.05, p > 0.05, see Figure 3.13). In this regard, surprisingly the level of environmental concern does not significantly alter the form and the strength of the interaction between packaging type and purchase intention, as clearly evidenced in Figure 3.14. Therefore, environmental concern does not have a moderating effect on the above-mentioned relationship. For this reason, H2 is not supported.

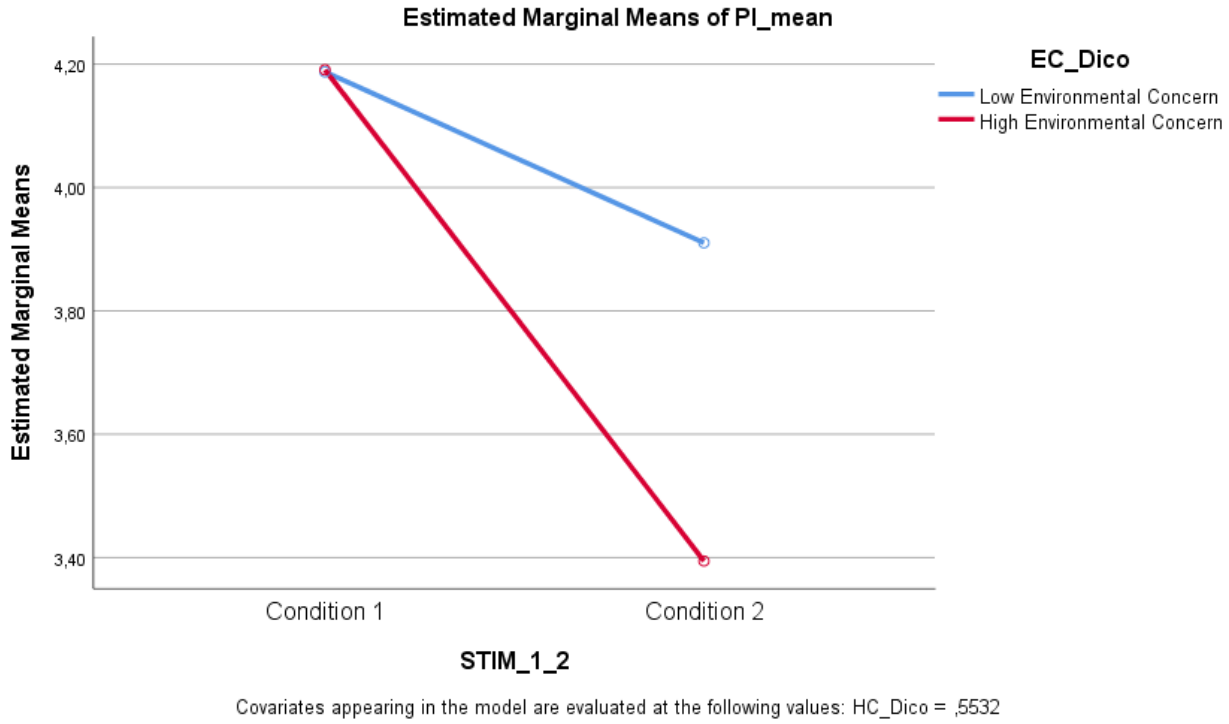

Figure 3.14: "OUTPUT SPSS: Purchase Intention in response to Packaging Types, considering different levels of Environmental Concern"

Table 3.3 summarizes hypotheses testing.

Table 3.3

Summary of Hypotheses		
	Hypotheses	
H1	*Purchase intention is more likely to be positively affected in the case of smaller packages wrapped in a larger one than in the case of a single package containing unwrapped food product.*	**Accepted**
H2	*When dealing with smaller packages wrapped in a larger one, purchase intention is more likely to be higher for consumers with a lower level of environmental concern; when dealing with a single package containing unwrapped food product, purchase intention is likely to be higher for consumers with a higher level of environmental concern.*	**Rejected**

Table 3.3: "Summary of Hypotheses"

Next section will discuss in-depth the analytical results, with the aim of better comprehending the trade-off between healthiness and sustainability which arises when purchasing a specific type of package rather than another. The aim of the discussion is to contribute to a conscious management of such trade-off for all stakeholders involved, by understanding the nature of specific interactions.

3.5 Discussion

This research explored a research area of increasing interest for consumers, governments, institutions, organizations, academic researchers, and companies. In fact, the nature of interaction between food, health and environment is of growing relevance due to the growing concern about the consequences that individuals' food choices have on the health and the environment.

For this reason, the present study focused on the individuals' willingness to buy different types of packaging, in order to investigate the potential interaction between healthiness and sustainability in the food sector. In particular, the objective was firstly to determine whether and to what extent packaging types influence purchase intention of the food products in both health- and environmentally concerned consumers. Second, it stressed the idea of environmental concern as a driver strong enough to lead consumers switching from buying a health-oriented package toward buying a more eco-friendly oriented package.

Findings demonstrate that, for the same amount of food product (in terms of weight), de facto consumers are more willing to buy smaller packages wrapped in a larger one than a single package containing unwrapped food product (H1). So, packaging type influences consumers' purchase intention.

Several considerations arise with regard to what has been measured.

Initially, there is need to clarify the reasons why consumers' willingness to buy both the proposed packaging types ($M_{PurchaseIntention} = 3.96$) is relatively low. This is not surprising and may be explained by considering two factors. First, types of pack are self-made and unbranded. Second, the front-of-pack label does not include, for example, nutritional information, whose consumer's interest about is increasingly rising for health reasons. In this regard, it consists only of information which are functional for the purpose of the present study (i.e. total weight of food product). So, the lack of knowledge about the food product, and the absence of characteristics – such as brand, typical colours, design, and graphics – aimed at prompting the purchase, negatively affected consumers' willingness to buy. This is in line with the idea about the key role of packaging in selling process, given its relevance for brand promotion and communication with customers (Kalam, 2018; Ahmed et al., 2014; Rettie & Brewer, 2000).

Furthermore, it is crucial to understand why consumers preferred the first type of packaging (Figure 3.1) rather than the second (Figure 3.2). the reason can be inferred by considering jointly two extremely important factors. First of all, it has been previously discussed as health concern and relative consciousness is growing overtime, in parallel with the increasing availability of information involving how to pursue wellbeing through the proper diet (FAO & WHO, 2019; IFIC 2019; Hoek et al., 2017; Tobler et al., 2011). In this regard, worldwide current dietary guidelines focus essentially on health as main objective, rather than on environmental sustainability (FAO & WHO, 2019). Moreover, consumers give a higher priority to health issues in diets, rather than to ecological ones. Consequently, health issues have a major impact with respect to environmental sustainability on purchase intention of food and beverages (IFIC 2019). In the second place, findings indicate respondents do not exert a strong food-related self-control ($M_{Self\text{-}Control} = 4.01$ out of 7). In this regard, it has been previously

evidenced the role of packaging in helping consumers to exert self-control and manage food consumption (Brunner, 2013; Reisch & Gwozdz, 2011; Wansink, 2004; Cutler et al., 2003).

For these reasons, a consumer is more likely to purchase a health-oriented type of pack containing micro-packs aimed at helping him to exert self-control and manage overconsumption. This choice definitely entails a trade-off concerning healthiness and sustainability. In this regard, findings are consistent with the idea expressed in Honkanen's et al. (2006) research, which suggests that individuals giving priority to self-centred motives (e.g. the health motive) rather than altruistic one (e.g. the environmental motive) might avoid more environmentally-sustainable food choices.

However, despite of rising feeling of concern towards the planet and eco-consciousness, findings indicate that, in contrast with previous research (Prakash & Pathak 2017; Paul et al., 2016; Koenig-Lewis et al., 2014; Birgelen et al., 2008; Pickett-Baker & Ozaki, 2008; Bech-Larsen, 1996), environmental concern seems not to directly influence consumers' buying behavior. Moreover, and surprisingly, environmental concern seems not to significantly affect the relationship between packaging type and purchase intention. Therefore, its influence seems not to be strong enough to moderate the form and the strength of the above-mentioned relationship. In other words, despite the fact that people are becoming more aware about the environmental impact of their food consumption behavior, there still appears to be a gap between the intention to adopt an eco-friendly lifestyle and the actual behavior, at least for what concerns food choices. This is in line with the idea that being environmentally involved is not a sufficient condition to choose environmentally friendly packaging (Thøgersen, 1999). So, consumers tend to prefer buying overpackaged food products apparently for health reasons, thus do not taking into account ecological footprint of the package and indirectly of their actions. However, findings of the present study are surprising considering concurrently the rising positive attitude toward the environment and also past research, according to which individuals tend to overestimate the environmental harm associated with packaging (Tobler et al., 2011; Lea & Worsley, 2008). Even recently, a new report by FoodPrint (2020) confirmed this theory. However, there are also reasons which might explain more clearly findings related to the role of environmental concern in this context. Neglecting some reasons – which will be discussed later in the section concerning limitations of the research – related to the intrinsic nature of the experiment, which may have influenced the results, there is reason to believe that however findings can be coherent and consistent with the higher level of priority consumers give in food choices to health issues with respect to environmental ones. With this in mind, although there is a clear trade-off, the attention for the environment does not change radically purchasing choices in the food sector. That is, no matter the level of environmental concern, the attention for a self-centred motive such as health always undermines the eco-friendly food buying choice. Another reason might involve the respondents' awareness of buying and consuming food products – especially snacks, which are the object of the experiment – too often impulsively. In this regard, the problem would appear to be related to the personal mood at point-of purchase and to the final aim of purchase. Furthermore, results may be explained considering that it has been studied overpackaging may result not only more functional, but also more attractive for consumers (Elgaaïed-Gambier, 2014).

To sum up, despite growing efforts for promoting the idea of a concurrently more healthy and environmentally sustainable diet, there is reason to believe there is still a long way to go. In fact, first of all, these two pivotal issues are not yet achievable concurrently in practice, without dealing with a certain proved trade-off, at least for what concern food packaging choices. Moreover, generally environmental issues and risks are still perceived as something distant from personal well-being, especially if compared to health issues and risks.

In the writer's opinion, there is urgent need of changing this way of thinking. People need to become aware that hurting the environment means hurting indirectly themselves. In this regard, if environmental problems were perceived as self-centred motives, there is reason to say individuals would be more motivated to behave in an eco-friendly way. Thus, they would be more willing to act concurrently in a healthy and environmentally sustainable manner. In fact, considering food packaging choices, preferring an eco-friendly alternative (as in the case of Figure 3.2) does not necessarily mean making a choice that undermines health. This depends also on consumers' motivation, because motivated individuals are more likely to manage impulsiveness and thus overconsumption while protecting environment at the same time.

3.5.1 Theoretical contributions

Theoretically, this study contributes in different ways to the increasingly important stream of research concerning food, health, and environment.

In particular, it is the first study to analyse the trade-off between healthiness and sustainability in food sector arising from choosing different packaging types. Specifically, it demonstrates such trade-off exists and therefore needs the attention of consumers, governments, institutions, organizations, academic researchers, and companies. In this regard, all the stakeholders have a role in reducing such trade-off, considering the key importance of both health and environmental issues.

Second, this research proposes a new and broader concept of overpackaging, based on an eco-friendly point of view. In fact, the packaging intrinsic nature of waste after consumption implies that packaging can be considered excessive in both cases in which has a grouping function or a marketing function.

Third, the analysis explored in which direction packaging type influences consumers' buying behavior considering their level of priority involving health and environment.

Fourth, the present investigation offers a contribution to the literature involving sustainable buying behavior, because it demonstrates apparently environmental concern neither affects directly nor moderates consumers' purchase intention of food packaged products.

3.5.2 Managerial implications

The present research recognizes the crucial importance of achieving concurrently health and sustainable goals in food sector. In this direction, from a practical standpoint and a managerial perspective, the current research presents interesting implications for consumers, companies, policy makers and governments.

It has been highlighted the tendency to focus more on food quality issues rather than on quantity ones. In this regard, from a consumers' point of view, a renewed awareness concerning the existence of trade-off between healthiness and sustainability – arising from choosing different packaging types – could lead them to act differently, from an eco-friendly perspective. Moreover, as consumers, people have the possibility to strongly influence strategic decisions of companies regarding their offer.

Furthermore, findings provided in this research suggest new managerial implications for both food companies and the entire packaging industry. In fact, food packaging management has a key role in achieving concurrently such pivotal goals. This research evidences that the convenience of food packaging is balanced out by the problems involving waste and relative ecological footprint. Therefore, at the packaging production level, there is need to re-think food packaging, and in particular single-use food packs and micro-packs, making simultaneously the health and the environment the priority over convenience. In this regard, eco-friendly packaging materials and a better design could reduce the above-mentioned trade-off, by focusing on less waste and more recycle. From a food companies' standpoint, the higher consumers' willingness to buy food packaged goods which support them in exerting self-control and managing overconsumption implies marketing campaigns should focus more on health risks and issues than on environmental ones. In fact, as regard to food market and especially the segment concerning snacks, environmental concern appears not to be yet considered a top priority influencing significantly consumers' buying decision-making process. However, it is also crucial for companies pursuing a circular economy, in order to reduce ecological footprint of their food products and to stimulate consumers' buying behavior. In this regard, eco-friendly trends are becoming increasingly important, and thus there is reason to say in the next future environmental concern will significantly influence individuals' buying decision-making process.

Moreover, the present findings should lead governments to sensitize more consumers about their key role in preventing environmental degradation. Therefore, institutional campaigns should aim at underlining how closely environmental issues affect us and specifically our own health.

Finally, this research evidences once more the urgency to enact stronger and more eco-friendly laws and regulations around packaging and plastics. In this regard, highlighting the existence and relevance of this trade-off in food sector arising from packaging choices should lead policy makers to actively address such issue.

In essence, this study claims the need of a holistic cooperation involving all the stakeholders of food sector to promote and safeguard health and environment concurrently.

This definitely means promoting a better future for the entire society.

3.6 Limitations & future research

The present research features some limitations that may have influenced the results and thus may provide avenues for future research.

First of all, results may have been influenced by the type of experiment conduced. In fact, online questionnaire may present some disadvantages. In this regard, it may be inadequate to understand some forms of information such as for example food consumption and buying behaviors. In fact, there could be a gap between consumers' purchase intention and actual buying behavior at the point of purchase. Future research should explore this gap, for example by preparing a similar experiment in field.

Moreover, initially the objective of the study was also to explore the impact of indications concerning the proper food quantity to consume on willingness to buy. The idea was to test whether a pack with such information, with respect to a package without such information, would prompt more consumers not to choose a packaging containing micro-packs with the same function (i.e. the less ecological alternative). Responses of the survey suggested insignificant results. However, these findings may have been affected by a similar perception of the proposed three stimuli, which has been amplified by the nature of the experiment. Therefore, conducting an experiment in field could lead to different results, because could prevent some form of response bias. With this in mind, future research may explore the role of food product labels in contrasting the phenomenon of functional and potentially avoidable overpackaging.

Other limitations involve characteristics of the sample. First, the final sample consisted of only 189 respondents. Thus, the sample may not be representative of the entire population, consequently reducing the consistency of results. Future research should carry out a research considering a sample of greater size, so as to propose more consistent findings. Second, since all respondents are Italian, the relative culture surely influenced the results. For this reason, future research should conduct a cross-national study to understand whether findings could be considered universally acceptable or if there are cross-cultural differences.

Another potential factor limiting the generalization of findings involves the choice of the type of food presented to respondents. In fact, interactions may result different if considering different food products which do not lead consumer to act impulsively, like for example fruits and vegetables. Therefore, future studies may test and compare consumer buying behavior among various type of food products.

Further, food-related self-control has not been included in the conceptual framework of this research. In this regard, future research should manipulate the level of food-related self-control in the presented conceptual framework. In fact, findings demonstrate environmental concern has neither moderating nor directly effect on consumers' purchase intention, but the level of self-control is relatively low. There is reason to believe that, in case of high food-related self-control, environmental concern may significantly influence the relation between packaging type and purchase intention. For this reason, future research may address this gap. In Addition, on a theoretical level, future studies could certainly investigate the role of self-control as moderator of the relationship discussed herein.

3.7 Present & future outlook on the research topic in the era of Covid-19

The novel Coronavirus is currently changing consumers' way of thinking, acting, and living. The exceptional nature and thus the negative consequences of this crisis will leave a trail and influence food consumption and buying behaviours, especially in the short- and mid-term. For this reason, the stream of research concerning food, health, and environment will have to deal also with this aspect. Therefore, future research deepening the topic of this study have to consider what is happening at the moment.

In this regard, the terror of contagion is changing food consumption and buying behavior, and in particular is pushing packaged food products. Health emergency is changing the idea of what is healthy. In this regard, in supermarkets, consumers are preferring packaged food products, perceived as safer, with respect to unpacked food products, exposed to contamination. In fact, whereas in the past unpacked foods – especially those to be collected in the bag with the gloves and to be weighted – were perceived as more healthy, natural, and hygienic, today packaged foods are perceived as healthier and hygienic. Perceived dangers are related to bad hygienic habits such as for example touching food without using gloves. This is a step backwards, especially considering that eco-friendly marketing campaigns promoting the unpacked were appealing in Italy an increasing number of consumers. The market analysis company Swg, on the recommendation of Comieco, revealed health emergency led 33% of the respondents to change their purchasing choices in favour of packaged products and 46% of those who, before the emergency, bought mainly unpacked products turned to packaged products (Giliberto, 2020). In this regard, the period of lockdown has strongly affected consumer habits. In fact, for example, the search for a healthier and safer product has resulted in a growth of consumption of organic fruit and vegetables (+14%) especially if packaged (+24%) (Manuelli, 2020).

The discussion can be in some way extended to the market of snacks, which is at the core of this research. In fact, chips, biscuits, crackers are consumed with the hands, and often shared with others.

Now, more than in the recent past, consumers' focus is on health rather than on environment. It has been previously highlighted as consumers' food buying behavior is more likely to be influenced by food healthfulness rather than by its eco-friendly features. Currently, the main perceived problem does not involve food quality or quantity, nor considers the environment but is related to food safety.

For this reason, in writer's opinion, health concern will remain a higher priority for consumers with respect to environmental concern in the short-term also because of this period of health crisis. Therefore, in this period it will influence more deeply food packaging choices. For this reason, in order to achieve also environmental goals, there is a need to strongly consider and pursue all the three Rs of sustainability (reduce, reuse, and recycle, ndr). In the next future, it is less likely consumer will demand less packaged products. It means it will be more difficult to significantly reduce the amount of packaging produced. But precisely for this reason, it is crucial to focus even more on reuse and especially recycle. In this regard, it will be crucial the ability of companies to continuously innovate in order to ensure an even more sustainable future. However, the future will be bright when the human race will become more conscious that hurting the environment means hurting indirectly itself.

Conclusion

Over the last decades, there has been increasing concern about consequences that food consumption behaviours have not only on consumers' health, but also on the environment. Therefore, nowadays a path towards a concurrently healthier and more sustainable diet is being mapped out. However, this research reveals oftentimes pursuing these two goals concurrently entails trade-off. More precisely, such trade-off may occur during purchasing choices of different types of packaging. In fact, this study recognized consumers are more willing to buy a package containing micro-packs aimed at managing overconsumption (i.e. a health-oriented package) rather than a single package containing unwrapped food product (i.e. an eco-friendly package). It means consumers give higher priority to their own health (i.e. a self-centred motive) than to the environment at the moment of purchasing a specific food product, especially in cases of low food-related self-control. In this regard, despite rising attention toward the environmental problems, environmental concern does not influence individuals enough to lead them to buy a different type of food packaged product. Moreover, in light of the health emergency caused by novel Coronavirus (i.e. Covid-19), this research expects health concern will remain a higher priority for consumers with respect to environmental concern, at least in the short-term. In fact, today the principal perceived problem for individuals affecting buying behavior regards food safety, which directly affects their own health, rather than the environmental degradation.

In this context, there is a need to ensure that such a trade-off continues to be reduced over time, as a result of the action of all stakeholders involved in. The hope is that over time individuals will realize that hurting the environment means indirectly hurting themselves, their children, and future generations.

4 Appendix
Online Questionnaire

Inizio blocco: Introduzione

Introduction Gentile rispondente, ti ringraziamo in anticipo per la partecipazione e l'attenzione dedicataci. Stiamo conducendo una ricerca di mercato in merito alle priorità che influenzano il consumatore nelle sue scelte di acquisto in ambito alimentare. Ti ricordiamo che non esistono risposte giuste o sbagliate. Le risposte sono anonime e verranno usate solo a fini di ricerca.

Fine blocco: Introduzione

Inizio blocco: Micropack

Micropack Per favore **guarda attentamente** questa immagine e rispondi alle seguenti domande.

Fine blocco: Micropack

Inizio blocco: Pack

Pack Per favore **guarda attentamente** questa immagine e rispondi alle seguenti domande.

Fine blocco: Pack

Inizio blocco: Pack_info

Pack_info Per favore **guarda attentamente** questa immagine e rispondi alle seguenti domande.

Fine blocco: Pack_info

Inizio blocco: Purchase Intention

Purchase Intention Quanto sei d'accordo con le seguenti affermazioni considerando una scala da 1 (totalmente in disaccordo) a 7 (totalmente d'accordo)?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Comprerei il prodotto illustrato: (1)	○	○	○	○	○	○	○
Prenderei in considerazione l'acquisto del prodotto illustrato: (2)	○	○	○	○	○	○	○
La probabilità che prenderei in considerazione l'acquisto del prodotto illustrato è alta: (3)	○	○	○	○	○	○	○

Fine blocco: Purchase Intention

Inizio blocco: Health Consciousness

Health_Consciousness Quanto sei d'accordo con le seguenti affermazioni considerando una scala da 1 (totalmente in disaccordo) a 7 (totalmente d'accordo)?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Scelgo attentamente il cibo per garantire la mia buona salute: (1)	○	○	○	○	○	○	○
Non mi considero un consumatore attento alla salute: (2)	○	○	○	○	○	○	○
Penso spesso a problemi relativi alla salute: (3)	○	○	○	○	○	○	○

Fine blocco: Health Consciousness

Inizio blocco: Environmental Concern

Environmental_Concern Quanto sei d'accordo con le seguenti affermazioni considerando una scala da 1 (totalmente in disaccordo) a 7 (totalmente d'accordo)?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
È importante per me che il prodotto che utilizzo non danneggi l'ambiente: (1)	○	○	○	○	○	○	○
Considero il potenziale impatto ambientale delle mie azioni quando prendo molte delle mie decisioni: (2)	○	○	○	○	○	○	○
Le mie abitudini d'acquisto sono influenzate dalla mia attenzione per l'ambiente: (3)	○	○	○	○	○	○	○
Sono preoccupato in merito allo spreco delle risorse del nostro pianeta: (4)	○	○	○	○	○	○	○
Mi descrivo come una persona responsabile verso l'ambiente: (5)	○	○	○	○	○	○	○
Sono disposto ad impegnarmi per intraprendere azioni più rispettose per l'ambiente: (6)	○	○	○	○	○	○	○

Fine blocco: Environmental Concern

Inizio blocco: Self Control

Self_Control Quanto sei d'accordo con le seguenti affermazioni considerando una scala da 1 (totalmente in disaccordo) a 7 (totalmente d'accordo)?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Faccio fatica a evitare le cattive abitudini alimentari: (1)	○	○	○	○	○	○	○
Vorrei avere più autodisciplina: (2)	○	○	○	○	○	○	○
A volte non riesco a smettere di mangiare: (3)	○	○	○	○	○	○	○

Fine blocco: Self Control

Inizio blocco: Attention Check - Stimoli

Attention Check L'immagine che hai visto in precedenza raffigura:

- ○ Una confezione di biscotti con all'interno 7 porzioni da 4 biscotti. (1)
- ○ Una confezione di biscotti sfusi senza indicazioni sulla porzione consigliata. (2)
- ○ Una confezione di biscotti sfusi con indicazioni sulla porzione consigliata. (3)

Fine blocco: Attention Check - Stimoli

Inizio blocco: Socio-demo

Gender Sesso:

- ○ Maschile (1)
- ○ Femminile (2)

*

Age Età:

_____

Income Guadagno annuale:

- ○ Meno di 15000€ (1)
- ○ Tra i 15000€ e i 40000€ (2)
- ○ Più di 40000€ (3)

Occupation Indica la tua occupazione:

- ○ Studente (1)
- ○ Libero professionista (2)
- ○ Impiegato (3)
- ○ Disoccupato (4)
- ○ Altro (5)

Education Titolo di studio:

- ○ Diploma di scuola secondaria superiore (1)
- ○ Laurea triennale (2)
- ○ Laurea Specialistica (3)
- ○ Altro (4)

Fine blocco: Socio-demo

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EXECUTIVE SUMMARY

Introduction

Since I was a child, I always believed food choices reflect individuals' lifestyle and values. In this regard, food has always been at the core of society, individuals' thought, religion, and even cultural and class differences. In my opinion, adopting a judicious and responsible food consumption behavior means respecting not only ourselves, but also the others. For this reason, food, health, and environmental issues are narrowly related and therefore need to be jointly considered and studied.

Nowadays, there is growing concern among individuals about the implications that their food consumption and buying behaviours have on both the health and the environment. However, literature has not yet explored widely these two aspects concurrently in the context of food consumption and buying behavior.

Thus, the present research aims to explore a research area which is becoming increasingly important today. Specifically, the aim of the research is to shed light on trends concerning food, health and environment in order to introduce the topic concerning the potential trade-off between healthiness and sustainability in consumers' food purchasing choices to all potential stakeholders having a role in pursuing healthy and/or sustainable objectives. Despite of evidences involving the current transition toward a concurrently healthier and more sustainable diet, several issues and obstacles may undermine the effective achievement of both the goals simultaneously. In particular, the present study aims to analyse the potential trade-off between healthiness and sustainability stemming from food overpackaging – intended as a package containing micro-packs – which, on one hand, should help consumers to manage food consumption, and, on the other hand, implies a higher ecological footprint. In this regard, the research attempts to analyse to what extent packaging types influence consumers' purchase intention of food products and so what this implies in managing the trade-off between healthiness and sustainability. Moreover, it will be explored the role of environmental concern in this context, as a driver potentially leading consumers to switch from buying a health-oriented package toward buying an eco-friendly oriented package.

The stakeholders involved in the debate who could be potentially affected by the consequences of the research are

a) Consumers, as the main direct category involved. In this regard, with respect to unpacked food products, micro-packages have the functional aim to indicate the proper food quantity to consume, thus apparently leading consumers toward a saner food consumption. Therefore, the research will shed light on whether and to what extent different packaging types with a different ecological footprint have an impact on willingness to buy, and why. Consequently, new insights concerning the potential trade-off between healthiness and sustainability will make consumers more conscious in their food decision-making process, thus leading them to act in a different way.

b) Food industry, as the category of companies which produces, processes, and commercializes different types of packaging. In fact, the insights provided in this research can influence the entire packaging industry at different levels. In fact, at production stage, it can consistently influence the way of producing and processing packages, in terms of materials used, shapes and final function, thus following a healthier and more sustainable path without economic losses. At commercial stage, by acknowledging consumers' priorities and way of living, thinking, and acting in food purchase decision-making process, the entire industry will be able to provide better packaging solutions aimed at satisfying consumers' needs and desires. In this direction, the research will evidence more clearly how making choices concerning packaging management.

c) Policy makers and Institutions, as the actors defining the rules and criteria whose purpose is to achieve healthier and more sustainable diet, without the achievement of health goals compromising the achievement of environmental ones.

The present work is articulated in 3 chapters, whose aim is to conduct the reader in a journey involving food, health and environmental trends and issues. The final objective is to provide to all the stakeholders new insights leading them to holistically and concurrently pursuing health and environmental goals in a more conscious and responsible way.

1 Food, Health & Environment

1.1 Background: Food, Health & Environment

There is rising concern among consumers about the consequences that their food consumption behaviors and decisions have not only on their health, but also on the environment (Hoek et al., 2017; Carrington et al., 2014; Tobler et al., 2011). In this regard, food production is responsible for approximately 20-35% of global greenhouse gas (GHG) emissions, and accounts respectively for 48% and 70% of all land and freshwater resources (FAO & WHO, 2019). In this regard, activities involving food production and consumption, such as cattle farming, transport, food waste and packaging can have negative consequences on the environment.

It means that, already today, food production systems are one the main drivers of environmental degradation and natural resources deficiency. In particular, it is expected that consumers' food consumption choices will have an increasingly greater impact on the environment in the next future.

1.2 Transition toward a healthy and sustainable diet.

The United Nations Food and Agriculture Organization defines sustainable diets as: "those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources" (FAO ,2010). The European Food Information Council recognizes three pillars to achieve a healthy and sustainable diet, which involve less consumption, the reduction of consumption of animal-based food products in favour of plant-based alternatives and finally less food wastage (EUFIC, 2018). In fact, first, there is a global trend toward overconsumption, which is a leading cause of overweight and obesity, and contributes to sustain unnecessary food demand, which in turn affect the environment. Furthermore, it is expected an increase in meat and dairy consumption (FAO, 2009), despite positive consequences concerning the foreseen trend toward a more diversified diet. This implies a higher ecological footprint, as lowering meat consumption is hugely environmentally relevant (Tobler et al., 2011; Jungbluth et al., 2000). Finally, *Estimates of European food waste levels* (Stenmark et al., 2016) indicate that food wastage is directly associated with ecological footprint in terms of consumed energy, climate change, water use and availability of resources.

Currently dietary guidelines worldwide aim essentially at health as main target. However, an increasing number of research are recognizing the importance of diets and food behaviors that should be based on environmental as well as nutritional science (FAO & WHO, 2019; Hoek et al., 2017; Horgan, et al., 2016; Van Dooren et al., 2014; Friel et al., 2013). Lampert et al. (2019) evidence the percentage of individuals worried about the potential damage humans can cause to the Earth is grown up from 71% in 2014 to 77% in 2019.

1.3 The potential trade-off between healthiness and sustainability regarding food choices

Achieving a healthy and sustainable diet may require trade-offs. In fact, despite evidences about synergies between healthiness and sustainability in food consumption behaviours, there are circumstances when pursuing the first goals may affect negatively the other one. Honkanen's et al. (2006) research suggests individuals giving priority to self-centred motives might eschew more environmentally-sustainable food product choices, whether a trade-off is supposed to occur between a self-centred motive like health, taste, or price and an attribute that should be beneficial for the whole society. Trade-offs involve food choices in consumers' diet for what concerns both quality and quantity issues. For instance, as regard to consumers' choices concerning trade-offs between food type and the level of environmental sustainability, healthy eating recommendations involve a higher consumption of fruits and vegetables (FAO & WHO, 2019). Notwithstanding, plant-based food products are characterized by a high ratio of losses in production and retailing, and heavily contribute to household food waste (Parfitt et al., 2010). Moreover, several products in this category require a lot of resources in terms of transportation and storage. Furthermore, consumers deal with trade-offs between food-quality and environmental sustainability even when decide to consume locally-grown foods. In fact, such food choice can be a sustainable one if individuals eat seasonal foods only during the season in which they are available. Actually, the cost of producing or stocking locally-grown foods outside from their natural growing seasons could be superior to shipping foods that are in season somewhere else. another trade-off concerning healthy diets and environmental sustainability involves fish consumption, because overfishing and depletion of some fish stocks could deeply affect entire ecosystems and wildlife (Garnett et al., 2014). Although today consumers' pay more attention on issues concerning food quality rather than quantity, health and sustainability trade-offs can occur also with refer to food quantity and portion size. Aschemannn-Witzel (2015) affirms overconsumption has a serious impact on both health and the environment. In this regard, consuming the proper food quantity would be beneficial from both perspectives. According to Reisch & Gwozdz (2011), a good approach for pursuing healthier diets consists of making "the healthy choice the easy choice". In this context, packaging seems to have a key role. Indeed, producing packaging in smaller units or units including several individually wrapped portion sizes seems to discourage unhealthy overconsumption. Despite of potential health benefits, a major production of packaging materials could affect the environment in different ways. Thus, the idea of packaging as a mean for delivering the proper portion size seems to lead to a trade-off between healthiness and sustainability. In this regard, package is proving to be a mean to achieve health and ecological-oriented results in diets. In particular, it is crucial to analyse in which way food overpackaging could affect the environment in the context of food industry.

1.4 The role of packaging in healthy and sustainable diets

Nowadays packaging has a key role also in food industry for consumers, as it protects and promotes the product, provides information on potential food healthiness, on how to consume it and on the proper portion size (Consumers Goods Forum, 2011). Furthermore, it provides consumers with easier purchasing choices. The growing population and the presence of more single-person households, together with changes in dietary patterns and packaging trends are contributing towards a rising demand for plastic packaging. The estimates indicate 16% of total European plastic demand – 8.2 million tonnes of plastic – is used for food and drink packaging only in Europe (ING, 2019). Moreover, there is evidence of increasing production of micro-packs because consumers either need to consume food at work

or tend to overconsume certain products such as for example cookies and crackers. For this reason, to manage relative consumption, some consumers prefer to buy smaller packages. (Jain, 2012; Scott et al., 2008). Nowadays only 30% in Europe and 9% of the world's plastic waste is recycled and, in details, 42% of plastic packaging waste in Europe (Figure 1.17). However, this does not imply companies could significantly and rapidly swap to other materials, because it is not realistic if considering the production volume of some products and thus the relative costs. In this regard, despite eco-friendly trends concerning packaging, the issue of overpackaging still represent an important problem and may entail a trade-off in food choices between healthiness and sustainability. In fact, on one hand, overpackaged goods contribute to produce unnecessary waste and consume more energy and freshwater, thus leading to environmental degradation. On the other hand, developing micro-packs may help consumers to control their food consumption, with good results in terms of healthiness. This trade-off involving the production of different packaging types could influence consumers' purchase intention, depending on their priorities.

2 Theoretical Background & Hypothesis Development

2.1 The effect of different packaging types on purchase intention

In a nutshell, academic research indicates products' package plays a crucial role for companies in marketing communications and for consumers in influencing and directing their willingness to buy a certain product. However, few research has been conducted on how consumers could react in terms of purchase intention to overpackaging and why, especially in the food sector. In this regard, Brunner (2013) demonstrated that the level of effort influences food consumption and buying behavior. Specifically, considering snacking behavior, unwrapping a food product or catching it with sugar tongs significantly affects consumption. In this context, Hoek et al. (2017) conducted a qualitative study into consumers' perceptions, experiences and attitudes to explore which actions lead consumers to adopt concurrently healthy and environmentally friendly food behaviors. Specifically, the researchers considered four target behaviors and explored food choices according to consumers' level of involvement with health and environmental issues. Results indicated consumers give priority to health issues with respect to environmental ones. Moreover, they have the highest motivation for reducing packaged food consumption in order to avoid excessive packaging and diminish food chemical intake. Furthermore, individuals have positive attitudes also for what concern reducing food waste and overconsumption. In light of this, the concept of overpackaging ties such topics with a red thread. Such concept has not been deepened widely in the literature. Elgaaïed-Gambier (2014) clarifies the notion of overpackaging by focusing on the prefix "over-", which commonly refers to "something excessive or superior to what is necessary". In this regard, it "describes products that are wrapped in more material than is needed or is wanted." However, this research considers the concept of overpackaging from a broader eco-friendly point of view. In fact, the above-mentioned packaging intrinsic nature of waste after consumption implies the idea that packaging can be considered excessive in both cases in which has a grouping function or a marketing function. De facto, the first has also a consistent ecological footprint, which could be avoided in some cases. According to Kotler et al. (2017), larger sizes packages positively influence consumption or frequency of use of a product. Especially in the food sector, according to Wansink (1996), considering equal caloric intake in one large package and multiple smaller packages, individuals will eat more from the large package. Scott et al. (2008) focused on whether consumers are able to effectively reduce consumption when eating from little packages rather than large packages. In contrast to

previous research, the study suggests that, under certain conditions, small packages can paradoxically increase consumption. In fact, those individuals who are restrained by a diet overconsume food in small packages due to a lapse in self-control and the misperception of caloric content. According to Kleef et al. (2014), consumers behave impulsively and consume more than needed especially when deal with several smaller units of food compared to a large one. In this regard, consumer coherently are more willing to purchase a product if it is presented in smaller packages and, especially when characterized by a shorter expiry date, consumers do not prefer large package sizes (Ahmadi et al., 2013). On this line, Argo & White (2012) suggested that small packages act as an external source of control. It means assuming that, considering the same food caloric intake, small packages will be more effective than a single larger package at managing consumers' food intake, as they comprise less product and thus fewer calories per portion than a single larger package. Often, small packages are sold in bundle or are wrapped in larger containers. Such aspect may limit the effectiveness of smaller packages in managing calories intake. In this regard, packaging in smaller units or units containing several wrapped portion sizes is suggested as a mean to discourage unhealthy consumption.

2.2 The role of self-control in reducing overpackaging of food products

Self-control is a relevant topic in consumers' behavior research, especially for what concerns consumers' food choices. Past literature widely recognized that there is reason to say self-control has a significant impact on consumers' healthiness due to its role in influencing food choices. In this regard, it is narrowly related with the topic of overconsumption. However, self-control potential failures led marketers to come up with new strategies over the years which may help consumers to increase self-control and manage consumption. In this regard, companies are facing the issue of overconsumption by offering different packs in terms of types and sizes which can successfully satisfy consumers' needs and desires, depending on relative priorities. For this reason, companies tend to offer a significant number of different solutions, from minipacks, aimed at making consumers able to better control food consumption, to larger packs.

2.3 The Relevance of Health Consciousness in Consumers' Decision-Making Process

In summary, recent literature and report consider health consciousness a principal driver of consumers' attitudes and behaviours all over the world. Specifically, it influences individuals' self-control and buying decision-making process, thus leading companies to adopt specific health-oriented marketing strategies to boost willingness to buy their food products. In this regard, the rising health consciousness of consumers is leading them to give more attention to packaging types, as previously evidenced, and labels (Coulson, 2000), which are functional to guide them toward a judicious food purchasing and consumption based on their priorities and values. So, consumers' level of health consciousness needs to be taken into consideration for the development of a conceptual framework aimed at deepening the potential trade-off between healthiness and sustainability stemming from buying different packaging types.

2.4 The moderating effect of environmental concern on purchase intention of food packaged products

This research focuses on environmental concern rather than knowledge because it is assumed that the consciousness of an existing trade-off which influences packaging purchase intention depends mostly on the consumers' attitude toward the environment rather than on the real consciousness of the impact that packaging would have on the

environment. A large number of past research focused mainly on the direct impact of environmental concern on purchase intention, as it is increasingly crucial in influencing consumers' food choices related to purchasing and consumption. In particular, part of the literature has focused also on the role of environmental concern in influencing food packaging evaluation and relative consumers' intention to buy. Bech-Larsen (1996) was among the first to consider the relevance of the environmental aspect of food packaging in influencing consumers' purchase decisions. In addition, ecologically responsible packaging has been proved to positively influence purchase intentions and brand evaluations (Rokka & Uusitalo, 2008; Birgelen et al., 2008). Koenig-Lewis et al., (2014) demonstrated that, in the context of ecologically responsible packaging, consumers' purchase intention was significantly influenced by environmental concern – confirming what has been previously suggested (Chamorro et al., 2009) – but curiously not by rational evaluation of benefits. Even Prakash & Pathak (2017) studied the willingness to buy eco-friendly packaged products, confirming that environmental concern has a key positive impact on purchase intention of ecologically responsible packages. However, despite there is a number of research concerning the relation between environmental concern, packaging issues, and consumers' purchase and consumption behaviors, it is almost absent the literature which considers, in the food sector, the excess of packaging as a potential factor affecting purchase intention. In this regard, only Elgaaïed-Gambier, 2014 explored in part the topic. researchers highlighted willingness to buy overpackaged products depends on the type of consumer. However, in the end, they recognized that, despite of consumers' efforts toward a sustainable choice entailing the purchase of non-overpackaged food products, several deterrents might prevent them from such choice. In fact, they suggested either negative beliefs, such as low-end and lack of protection, or perceived usefulness and attractiveness may significantly affect their purchasing behavior.

However, the relation between food packaging choices and consumers' priorities has not been widely discussed, especially considering recent trends and the rising importance of topics concerning food quantity issues.

This additional evidence reveals a research gap that needs to be addressed.

2.5 Conceptual Framework and Hypothesis Development

Nowadays there is growing attention among consumers about the consequences that their food choices have on their health and the environment. Oftentimes, these two aspects have not been explored concurrently, thus leading to a misperception about the actual people's way of thinking and living. However, what has been previously discussed reveals a clear trend toward a deeper health and environmental concern of individuals worldwide. Moreover, there is reason to say food choices reflect individuals' lifestyle. In the last decade, there has been a tendency to focus more on food quality rather than quantity. However, the foregoing evidences suggest food quantity issues need to be further explored and addressed, because may affect both individuals' healthiness and environment.

In this regard, the literature of the last decades and the ongoing trends presented in the first two chapters concerning food buying and consumption behavior clearly reveals the need for shedding light on the role of packaging in addressing health and environmental objectives. From a health point of view, it may be useful for indicating the correct portion size and leading consumers toward a more careful and food consumption. This may be the case for example of a larger package containing more small packages, aimed at indicating the proper portion size to consume. Conversely, from an environmental point of view, the debate is more complex. The attention institutions, companies, organizations, and researchers are giving to the topic of recycling are undoubtedly extremely important to reduce the ecological footprint of packaging over time. However, it has been also discussed the fact that there is not yet

possibility to recycle 100% of packaging. Such trend will gradually change, but it is evident that the first "R" of sustainability – reduce – still has and will definitely have the highest impact on the environment in the future. In this regard, avoiding the production and the purchase of smaller wraps into a larger one, aimed at controlling food consumption, could be considered an environmentally friendly practice.

However, given the ongoing trends, no academic research has examined how excess of packaging influences willingness to buy in both healthy and environmentally concerned consumers. This is a crucial aspect to consider in discussing food quantity trade-off involving healthiness and sustainability.

Previous research seems to suggest a significant influence of packaging type on purchase intention. Notwithstanding, it is not clear which type of packaging – whether more small packages wrapped in a larger one or a single package containing unwrapped food products – influences more purchase intention and why. In this regard, in the case of food products, it is still unclear whether consumers are seriously aware of the amount of excess package while making their food purchase choice, and if they are, it is uncertain what level of priority they give to such aspect compared with health issue. Considering the above-mentioned literature, the first type of packaging implies an excess of materials used and should stimulate individuals' capacity to exert a stronger food related self-control. Thus, it is more health oriented. Instead the second type of packaging is more environmentally friendly, and it is probably more suitable for those individuals with a high food-related trait self-control.

However, considering what has been previously discussed about the fact that consumers apparently still give a higher priority to healthiness with respect to environment, there is reason to hypothesize that:

H1. *Purchase intention is more likely to be positively affected in the case of smaller packages wrapped in a larger one than in the case of a single package containing unwrapped food product.*

In addition, previous literature has clearly highlighted as environmental concern is an even more relevant factor in influencing consumers' food purchasing choices. In fact, nowadays trends suggest a rising environmental concern and eco-consciousness. Individuals are becoming more aware about the importance of the role that they themselves play in achieving sustainable objectives. Specifically, for what concerns the topic of packaging and overpackaging, individuals tend to overestimate the environmental harm associated with packaging (Tobler et al., 2011; Lea & Worsley, 2008). According to Dam (1996), a feasible explanation for this misperception might derive from the fact that consumers personally experience the post-consumption phase of packaging because they must dispose of it. This may subsequently lead to an overestimate of the relative environmental impact. In this regard, there is reason to say that consumers' willingness to buy depends on different types of packages. Hence, it is hypothesized that:

H2. *When dealing with smaller packages wrapped in a larger one, purchase intention is more likely to be higher for consumers with a lower level of environmental concern; when dealing with a single package containing unwrapped food product, purchase intention is likely to be higher for consumers with a higher level of environmental concern.*

Given the focus on the environmental variable and on the other hand the key role of health consciousness in consumers' food decision-making process, it will be set as a control variable. In this regard, it will be held constant, in order not to influence the interactions among aforementioned variables.

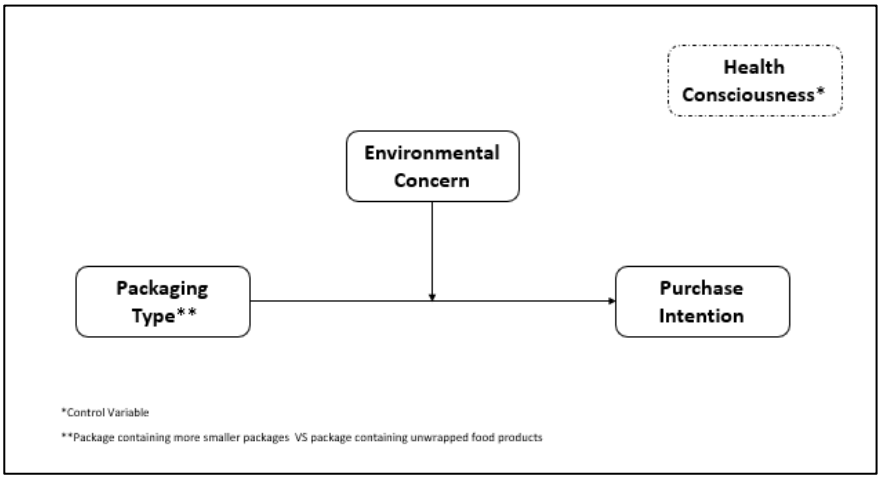

Figure 2.1: Conceptual Framework

3 Marketing Research Development

3.1 Research Methodology

The empirical analysis carried out in this research had a twofold objective. First, it aimed to determine whether and to what extent packaging types influence willingness to buy the food products in both health- and environmentally concerned consumers. Second, it aimed to estimate whether and how strongly the environmental concern affects the relationship between packaging type and consumers' purchase intention of food products. For this reason, experimental design was chosen, as it is widely recognized as the most appropriate for testing causal relationship (Saunders et al., 2009).

Using experimental conditions and a control variable (i.e. health consciousness), the study manipulated packaging type in consumers' food purchasing choices. Specifically, the current research conducted an online experiment in which participants have been randomly assigned to one out of three different conditions and then asked to fill out a questionnaire. The presented conceptual framework implies the use of a moderation model to analyse data.

More precisely, to test H1, packaging type was used as independent variable (X) and consumers' purchase intention as dependent variable (Y). Furthermore, to test H2, a moderation model with environmental concern as moderating variable (W) was employed (Figure 2.1). In this regard, the study used a 2 (packaging type: package containing food micro-packages versus package containing unwrapped food products) × 2 (environmental concern: high versus low) between-subjects experimental design. Packaging type is a nonmetric variable while purchase intention is a metric variable. Environmental concern and health consciousness are continuous variables which have been studied as dichotomous ones (high versus low) by using the method of Median Split.

3.2 Questionnaire Design & Variables' Measures

The research has been conducted through an online questionnaire (see Appendix A), developed on Qualtrics XM and sent by social network (WhatsApp, Facebook, Instagram, LinkedIn) in the period between the 7th and the 25th of April 2020. The time requested to fill the questionnaire was about 4 minutes. The survey has been completely written in Italian, since the sample was 100% Italian.

The survey was divided into 8 sections/blocks, regarding respectively:

- Introduction
- Stimuli/Pictures
- Purchase Intention
- Health Consciousness

- Food-related Self control
- Environmental Concern
- Attention Check
- Socio-demographic

Specifically, the survey consisted of close ended questions, which were formulated using a simple language characterized by commonly used words. More precisely, scales and items have been selected by reviewing literature, so as to be clear, exhaustive, and mutually exclusive.

For what concerns the assigned stimulus/picture, it has been decided to focus on packs of biscuits since the rate of snack consumption in developed countries is increasing over time. In this regard, the development of food industry concerning production and packaging of snacks has a growing impact on both health and environment.

However, oftentimes individuals are not care about the proper food quantity. With this in mind, food market proposes several types of packaging, in order to satisfy all the potential needs and desire. For this reason, this research proposes three different stimuli in the survey:

Figure 3.1: "package of cookies containing micro-packs based on the recommended portion size"

Figure 3.2: "package of cookies containing unwrapped food products"

Figure 3.3: "package of cookies containing unwrapped food products with indications concerning the proper food quantity to consume"

3.3 Results

After dataset cleaning, results were analysed using IBM SPSS Statistics (Statistical Package for Social Science).

However, to test hypotheses, the analysis of results concerns only the responses based on the first and second stimuli (i.e. *Package of cookies containing micro-packs based on the recommended portion size* versus p*ackage of cookies containing unwrapped food products*). In fact, the real difference in packaging type involves only the first two stimuli (see Figure 3.1 and Figure 3.2), because the third one (see Figure 3.3) differs from the second only for the specific information on the pack regarding the proper food quantity of product to consume.

3.3.1 Sample Description

After dataset cleaning, the final sample consisted of 189 participants (66 male, 123 female, M_{age} = 33.70, SD_{age} = 14,51), 61% with low annual income (below 15000€), 34% with average annual income (between 15000€ and 40000€), and 5% with high annual income (above 40000€). Furthermore, sample is characterized by a good level of education. given the level of education, it is not surprising the high average value of both environmental concern and health consciousness ($M_{EnvironmentalConcern}$ = 5.26, $M_{HealthConsciousness}$ = 5.28).

3.3.2 Hypotheses Testing

A two-way ANOVA (Analysis of Variance) has been used to measure interaction between variables and test hypotheses H1 and H2. Health consciousness has been used as control variable. Test of between-subjects effects reveals a significant interaction for what concern main effect ($F = 4.45$, $p < 0.05$), which confirms packaging type influences consumers' purchase intention. In particular, for the same amount of food product, consumer are more willing to buy a package containing smaller packages ($M_{PurchaseIntention\ (1)} = 4.18$) rather than a single package containing unwrapped food product ($M_{PurchaseIntention\ (2)} = 3.65$). Thus, H1 is supported. Instead, environmental concern does not significantly affect directly purchase intention ($F = 0.965$, $p > 0.05$). In addition, it does not have a moderating effect on the relationship between packaging type and purchase intention ($F = 1.05$, $p > 0.05$). In this regard, the level of environmental concern does not significantly alter the form and the strength of the interaction between packaging type and purchase intention. For this reason, H2 is not supported.

3.4 Discussion

The present study focused on the individuals' willingness to buy different types of packaging, in order to investigate the potential interaction between healthiness and sustainability in the food sector. In particular, the objective was firstly to determine whether and to what extent packaging types influence purchase intention of the food products in both health- and environmentally concerned consumers. Second, it stressed the idea of environmental concern as a driver strong enough to lead consumers switching from buying a health-oriented package toward buying a more eco-friendly oriented package.

Findings demonstrate that, for the same amount of food product (in terms of weight), de facto consumers are more willing to buy smaller packages wrapped in a larger one than a single package containing unwrapped food product (H1). So, packaging type influences consumers' purchase intention.

Several considerations arise with regard to what has been measured.

Initially, there is need to clarify the reasons why consumers' willingness to buy both the proposed packaging types ($M_{PurchaseIntention} = 3.96$) is relatively low. This is not surprising and may be explained by considering two factors. First, types of pack are self-made and unbranded. Second, the front-of-pack label does not include, for example, nutritional information, whose consumer's interest about is increasingly rising for health reasons. In this regard, it consists only of information which are functional for the purpose of the present study (i.e. total weight of food product). So, the lack of knowledge about the food product, and the absence of characteristics – such as brand, typical colours, design, and graphics – aimed at prompting the purchase, negatively affected consumers' willingness to buy. This is in line with the idea about the key role of packaging in selling process, given its relevance for brand promotion and communication with customers (Kalam, 2018; Ahmed et al., 2014; Rettie & Brewer, 2000).

Furthermore, it is crucial to understand why consumers preferred the first type of packaging (Figure 3.1) rather than the second (Figure 3.2). the reason can be inferred by considering jointly two extremely important factors. First of all, it has been previously discussed as health concern and relative consciousness is growing overtime, in parallel with the increasing availability of information involving how to pursue wellbeing through the proper diet (FAO & WHO, 2019; IFIC 2019; Hoek et al., 2017; Tobler et al., 2011). In this regard, worldwide current dietary guidelines focus essentially on health as main objective, rather than on environmental sustainability (FAO & WHO, 2019). Moreover, consumers give a higher priority to health issues in diets, rather than to ecological ones. Consequently,

health issues have a major impact with respect to environmental sustainability on purchase intention of food and beverages (IFIC 2019). In the second place, findings indicate respondents do not exert a strong food-related self-control ($M_{Self\text{-}Control}$ = 4.01 out of 7). In this regard, it has been previously evidenced the role of packaging in helping consumers to exert self-control and manage food consumption (Brunner, 2013; Reisch & Gwozdz, 2011; Wansink, 2004; Cutler et al., 2003).

For these reasons, a consumer is more likely to purchase a health-oriented type of pack containing micro-packs aimed at helping him to exert self-control and manage overconsumption. This choice definitely entails a trade-off concerning healthiness and sustainability. In this regard, findings are consistent with the idea expressed in Honkanen's et al. (2006) research, which suggests that individuals giving priority to self-centred motives (e.g. the health motive) rather than altruistic one (e.g. the environmental motive) might avoid more environmentally-sustainable food choices. However, despite of rising feeling of concern towards the planet and eco-consciousness, findings indicate that, in contrast with previous research (Prakash & Pathak 2017; Paul et al., 2016; Koenig-Lewis et al., 2014; Birgelen et al., 2008; Pickett-Baker & Ozaki, 2008; Bech-Larsen, 1996), environmental concern seems not to directly influence consumers' buying behavior. Moreover, and surprisingly, environmental concern seems not to significantly affect the relationship between packaging type and purchase intention. Therefore, its influence seems not to be strong enough to moderate the form and the strength of the above-mentioned relationship. In other words, despite the fact that people are becoming more aware about the environmental impact of their food consumption behavior, there still appears to be a gap between the intention to adopt an eco-friendly lifestyle and the actual behavior, at least for what concerns food choices. This is in line with the idea that being environmentally involved is not a sufficient condition to choose environmentally friendly packaging (Thøgersen, 1999). So, consumers tend to prefer buying overpackaged food products apparently for health reasons, thus do not taking into account ecological footprint of the package and indirectly of their actions. However, findings of the present study are surprising considering concurrently the rising positive attitude toward the environment and also past research, according to which individuals tend to overestimate the environmental harm associated with packaging (Tobler et al., 2011; Lea & Worsley, 2008). Even recently, a new report by FoodPrint (2020) confirmed this theory. However, there are also reasons which might explain more clearly findings related to the role of environmental concern in this context. Neglecting some reasons – which will be discussed later in the section concerning limitations of the research – related to the intrinsic nature of the experiment, which may have influenced the results, there is reason to believe that however findings can be coherent and consistent with the higher level of priority consumers give in food choices to health issues with respect to environmental ones. With this in mind, although there is a clear trade-off, the attention for the environment does not change radically purchasing choices in the food sector. That is, no matter the level of environmental concern, the attention for a self-centred motive such as health always undermines the eco-friendly food buying choice. Another reason might involve the respondents' awareness of buying and consuming food products – especially snacks, which are the object of the experiment – too often impulsively. In this regard, the problem would appear to be related to the personal mood at point-of purchase and to the final aim of purchase. Furthermore, results may be explained considering that it has been studied overpackaging may result not only more functional, but also more attractive for consumers (Elgaaïed-Gambier, 2014).

To sum up, despite growing efforts for promoting the idea of a concurrently more healthy and environmentally sustainable diet, there is reason to believe there is still a long way to go. In fact, first of all, these two pivotal issues are not yet achievable concurrently in practice, without dealing with a certain proved trade-off, at least for what concern food packaging choices. Moreover, generally environmental issues and risks are still perceived as something distant from personal well-being, especially if compared to health issues and risks.

In the writer's opinion, there is urgent need of changing this way of thinking. People need to become aware that hurting the environment means hurting indirectly themselves. In this regard, if environmental problems were perceived as self-centred motives, there is reason to say individuals would be more motivated to behave in an eco-friendly way. Thus, they would be more willing to act concurrently in a healthy and environmentally sustainable manner. In fact, considering food packaging choices, preferring an eco-friendly alternative (as in the case of Figure 3.2) does not necessarily mean making a choice that undermines health. This depends also on consumers' motivation, because motivated individuals are more likely to manage impulsiveness and thus overconsumption while protecting environment at the same time.

3.4.1 Theoretical Contributions

Theoretically, this study contributes in different ways to the increasingly important stream of research concerning food, health, and environment.

In particular, it is the first study to analyse the trade-off between healthiness and sustainability in food sector arising from choosing different packaging types. Specifically, it demonstrates such trade-off exists and therefore needs the attention of consumers, governments, institutions, organizations, academic researchers, and companies. In this regard, all the stakeholders have a role in reducing such trade-off, considering the key importance of both health and environmental issues.

Second, this research proposes a new and broader concept of overpackaging, based on an eco-friendly point of view. In fact, the packaging intrinsic nature of waste after consumption implies that packaging can be considered excessive in both cases in which has a grouping function or a marketing function.

Third, the analysis explored in which direction packaging type influences consumers' buying behavior considering their level of priority involving health and environment.

Fourth, the present investigation offers a contribution to the literature involving sustainable buying behavior, because it demonstrates apparently environmental concern neither affects directly nor moderates consumers' purchase intention of food packaged products.

3.4.2 Managerial Implications

The present research recognizes the crucial importance of achieving concurrently health and sustainable goals in food sector. In this direction, from a practical standpoint and a managerial perspective, the current research presents interesting implications for consumers, companies, policy makers and governments.

It has been highlighted the tendency to focus more on food quality issues rather than on quantity ones. In this regard, from a consumers' point of view, a renewed awareness concerning the existence of trade-off between healthiness and sustainability – arising from choosing different packaging types – could lead them to act differently, from an eco-friendly perspective. Moreover, as consumers, people have the possibility to strongly influence strategic decisions of companies regarding their offer.

Furthermore, findings provided in this research suggest new managerial implications for both food companies and the entire packaging industry. In fact, food packaging management has a key role in achieving concurrently such pivotal goals. This research evidences that the convenience of food packaging is balanced out by the problems involving waste and relative ecological footprint. Therefore, at the packaging production level, there is need to re-think food packaging, and in particular single-use food packs and micro-packs, making simultaneously the health and the environment the priority over convenience. In this regard, eco-friendly packaging materials and a better design could reduce the above-mentioned trade-off, by focusing on less waste and more recycle. From a food companies' standpoint, the higher consumers' willingness to buy food packaged goods which support them in exerting self-control and managing overconsumption implies marketing campaigns should focus more on health risks and issues than on environmental ones. In fact, as regard to food market and especially the segment concerning snacks, environmental concern appears not to be yet considered a top priority influencing significantly consumers' buying decision-making process. However, it is also crucial for companies pursuing a circular economy, in order to reduce ecological footprint of their food products and to stimulate consumers' buying behavior. In this regard, eco-friendly trends are becoming increasingly important, and thus there is reason to say in the next future environmental concern will significantly influence individuals' buying decision-making process.

Moreover, the present findings should lead governments to sensitize more consumers about their key role in preventing environmental degradation. Therefore, institutional campaigns should aim at underlining how closely environmental issues affect us and specifically our own health.

Finally, this research evidences once more the urgency to enact stronger and more eco-friendly laws and regulations around packaging and plastics. In this regard, highlighting the existence and relevance of this trade-off in food sector arising from packaging choices should lead policy makers to actively address such issue.

In essence, this study claims the need of a holistic cooperation involving all the stakeholders of food sector to promote and safeguard health and environment concurrently.

This definitely means promoting a better future for the entire society.

3.5 Limitations & Future Research

The present research features some limitations that may have influenced the results and thus may provide avenues for future research.

First of all, results may have been influenced by the type of experiment conduced. In fact, online questionnaire may present some disadvantages. In this regard, it may be inadequate to understand some forms of information such as for example food consumption and buying behaviors. In fact, there could be a gap between consumers' purchase intention and actual buying behavior at the point of purchase. Future research should explore this gap, for example by preparing a similar experiment in field.

Moreover, initially the objective of the study was also to explore the impact of indications concerning the proper food quantity to consume on willingness to buy. The idea was to test whether a pack with such information, with respect to a package without such information, would prompt more consumers not to choose a packaging containing micro-packs with the same function (i.e. the less ecological alternative). Responses of the survey suggested insignificant results. However, these findings may have been affected by a similar perception of the proposed three stimuli, which has been amplified by the nature of the experiment. Therefore, conducting an experiment in field

could lead to different results, because could prevent some form of response bias. With this in mind, future research may explore the role of food product labels in contrasting the phenomenon of functional and potentially avoidable overpackaging.

Other limitations involve characteristics of the sample. First, the final sample consisted of only 189 respondents. Thus, the sample may not be representative of the entire population, consequently reducing the consistency of results. Future research should carry out a research considering a sample of greater size, so as to propose more consistent findings. Second, since all respondents are Italian, the relative culture surely influenced the results. For this reason, future research should conduct a cross-national study to understand whether findings could be considered universally acceptable or if there are cross-cultural differences.

Another potential factor limiting the generalization of findings involves the choice of the type of food presented to respondents. In fact, interactions may result different if considering different food products which do not lead consumer to act impulsively, like for example fruits and vegetables. Therefore, future studies may test and compare consumer buying behavior among various type of food products.

Further, food-related self-control has not been included in the conceptual framework of this research. In this regard, future research should manipulate the level of food-related self-control in the presented conceptual framework. In fact, findings demonstrate environmental concern has neither moderating nor directly effect on consumers' purchase intention, but the level of self-control is relatively low. There is reason to believe that, in case of high food-related self-control, environmental concern may significantly influence the relation between packaging type and purchase intention. For this reason, future research may address this gap. In Addition, on a theoretical level, future studies could certainly investigate the role of self-control as moderator of the relationship discussed herein.

3.6 Present & Future Outlook on the Research Topic in the Era of Covid-19

The novel Coronavirus is currently changing consumers' way of thinking, acting, and living. The exceptional nature and thus the negative consequences of this crisis will leave a trail and influence food consumption and buying behaviours, especially in the short- and mid-term. For this reason, the stream of research concerning food, health, and environment will have to deal also with this aspect. Therefore, future research deepening the topic of this study have to consider what is happening at the moment.

In this regard, the terror of contagion is changing food consumption and buying behavior, and in particular is pushing packaged food products. Health emergency is changing the idea of what is healthy. In this regard, in supermarkets, consumers are preferring packaged food products, perceived as safer, with respect to unpacked food products, exposed to contamination. In fact, whereas in the past unpacked foods – especially those to be collected in the bag with the gloves and to be weighted – were perceived as more healthy, natural, and hygienic, today packaged foods are perceived as healthier and hygienic. Perceived dangers are related to bad hygienic habits such as for example touching food without using gloves. This is a step backwards, especially considering that eco-friendly marketing campaigns promoting the unpacked were appealing in Italy an increasing number of consumers. The market analysis company Swg, on the recommendation of Comieco, revealed health emergency led 33% of the respondents to change their purchasing choices in favour of packaged products and 46% of those who, before the emergency, bought mainly unpacked products turned to packaged products (Giliberto, 2020). In this regard, the period of lockdown has strongly

affected consumer habits. In fact, for example, the search for a healthier and safer product has resulted in a growth of consumption of organic fruit and vegetables (+14%) especially if packaged (+24%) (Manuelli, 2020).

The discussion can be in some way extended to the market of snacks, which is at the core of this research. In fact, chips, biscuits, crackers are consumed with the hands, and often shared with others.

Now, more than in the recent past, consumers' focus is on health rather than on environment. It has been previously highlighted as consumers' food buying behavior is more likely to be influenced by food healthfulness rather than by its eco-friendly features. Currently, the main perceived problem does not involve food quality or quantity, nor considers the environment but is related to food safety.

For this reason, in writer's opinion, health concern will remain a higher priority for consumers with respect to environmental concern in the short-term also because of this period of health crisis. Therefore, in this period it will influence more deeply food packaging choices. For this reason, in order to achieve also environmental goals, there is a need to strongly consider and pursue all the three Rs of sustainability (reduce, reuse, and recycle, ndr). In the next future, it is less likely consumer will demand less packaged products. It means it will be more difficult to significantly reduce the amount of packaging produced. But precisely for this reason, it is crucial to focus even more on reuse and especially recycle. In this regard, it will be crucial the ability of companies to continuously innovate in order to ensure an even more sustainable future. However, the future will be bright when the human race will become more conscious that hurting the environment means hurting indirectly itself.

Conclusion

Over the last decades, there has been increasing concern about consequences that food consumption behaviours have not only on consumers' health, but also on the environment. Therefore, nowadays a path towards a concurrently healthier and more sustainable diet is being mapped out. However, this research reveals oftentimes pursuing these two goals concurrently entails trade-off. More precisely, such trade-off may occur during purchasing choices of different types of packaging. In fact, this study recognized consumers are more willing to buy a package containing micro-packs aimed at managing overconsumption (i.e. a health-oriented package) rather than a single package containing unwrapped food product (i.e. an eco-friendly package). It means consumers give higher priority to their own health (i.e. a self-centred motive) than to the environment at the moment of purchasing a specific food product, especially in cases of low food-related self-control. In this regard, despite rising attention toward the environmental problems, environmental concern does not influence individuals enough to lead them to buy a different type of food packaged product. Moreover, in light of the health emergency caused by novel Coronavirus (i.e. Covid-19), this research expects health concern will remain a higher priority for consumers with respect to environmental concern, at least in the short-term. In fact, today the principal perceived problem for individuals affecting buying behavior regards food safety, which directly affects their own health, rather than the environmental degradation. In this context, there is a need to ensure that such a trade-off continues to be reduced over time, as a result of the action of all stakeholders involved in. The hope is that over time individuals will realize that hurting the environment means indirectly hurting themselves, their children, and future generations.