

# MASTER THESIS EXPOSE

## Consumers' perceptions of sustainable packaging in the food industry



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U N I K A S S E L  
V E R S I T Ä T



## Abstract

**Title:** Consumers' perceptions of sustainable packaging in the food industry

**Background:** Since individuals are gaining awareness regarding the negative impact of packaging – and especially plastic packaging – on the environment, companies are slowly changing their packaging since legislation become more restrictive and consumers are searching to buy environmentally friendly packaging. However, there is a discrepancy between consumers' perceptions of sustainable packaging and their actual sustainability.

**Aim:** The purpose of this research is to analyse and measure consumers' perceptions of specific sustainable packaging to identify the reasons for which individuals are shifting to greener packaging or are facing difficulties doing it.

**Methodology:** A choice experiment designed for the French market will be presented on-line to buyers and consumers of cereals - a fast-moving consumer goods product. A structural equation modelling will be used to measure via a multi-group analysis using a Smart PLS fit consumers' perceptions of different specific types of packaging.

**Contributions:** This research will contribute to the academic literature regarding consumers' perceptions of packaging within the context of sustainable packaging for fast-moving consumer goods. Companies will be able to understand what drivers and barriers individuals are facing when shifting to greener packaging and how consumers are perceiving specific sustainable packaging in terms of perceived environmental friendliness, perceived expensiveness, perceived quality and perceived convenience.

**Keywords:** Consumer behaviour, Sustainable packaging, Packaging, Perceived quality, Perceived expensiveness, Perceived environmental friendliness, Perceived convenience.

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## List of abbreviations

EFP	Environmentally-friendly packaging
e.g.	Exempli gratia
FMCG	Fast Moving Consumer Good
i.e.	Id est
IEEP	Institute for European Environmental Policy
LCA	Life Cycle Assessment
SEM	Structural Equation Modelling
SPA	Sustainable Packaging Alliance
SPC	Sustainable Packaging Coalition

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## 1. Introduction

Since the creation of plastic during the 19<sup>th</sup> century global plastic production have grown exponentially. Between 1950 and 2017, according to Plastic Atlas (2019), 9.2 billion tons of plastics were produced, while in 2018, according to Statista, 359 million metrics tons have been created worldwide (Statista) including almost 62 million metrics tons in Europe (Plastics Europe Market Research Group, 2019). While industries using plastics are constantly increasing, the packaging industry remains the principal plastic consumer (almost 40% of the market demand for plastic in 2017 according to Plastics Europe) with 158 million tons of plastics used in 2017 (Plastic Atlas, 2019). Thus, nowadays most items available for purchase are presented under plastic packaging to potential customers.

One sector extensively using packaged items is the food-processing industry with, in 2018 the utilization of 1.13 trillion of packaging items exclusively within the European Union (Plastic Atlas, 2019). In fact, according to the Institute for European Environmental Policy (IEEP), this year 900 billion items of packaged food and drink will be consumed annually by Europeans. However, this consumption of plastic is not without consequences. Consumers' search for convenience and ready-to-go products induce an increasing need for single-use products and packaging which are mainly made using plastic when "40% of plastic products are garbage after less than a month" (Plastic Atlas 2<sup>nd</sup> Edition, 2019 p15) and less than 10% of all plastics ever produced has been recycled (Plastic Atlas, 2019).

Aware of those issues, companies are slowly trying to incorporate greener aspects and/or to develop sustainable packaging to answer their consumers' needs and respect their sustainable commitment. However, packaging being the cornerstone of companies' marketing-mix (Olsson et al. 2002), incorporating greener aspects in packaging without affecting packaging' other functions can be a challenge for companies (Prendergast et al. 1996). Indeed, packaging satisfies protection (Robertson, 1990), information (Wyrwa and Barska 2017), marketing functions (Rundh, 2005) and can influence consumers' perceived safety (Siu and Wong, 2002), quality, value and brand preference (Wang, 2013). Aware of the strategic importance of packaging, many studies have been conducted to understand which packaging' elements can influence consumers' perception and how they are influencing it. This way, studies have been analyzing, for instance, the effect of shape (Pantin Sohier, 2009), size (Wansink, 1996), colours (Kauppinen-Räsänen, 2014) or visual and verbal claims (Magnier and Schoormans 2015).

The academic literature has emphasized its attention on the evolution of consumers' perception following the modification on a single component in the particular context of traditional packaging. Hereby, researches analyzing how the implementation of sustainable packaging can influence consumers' perception and therefore consumers' decisions have been less studied (Boz et al., 2020) when according to the existing literature, eco-friendly packaging can also affect consumers' perception (Ketelsen et al., 2020) in terms of convenience (Steenis et al., 2017), price (Scott and Vigar-Ellis, 2014; Magnier and Crié, 2015), health benefits (Scott and Vigar-Ellis, 2014), quality (Ertz et al., 2017; Magnier and Crié, 2015; Magnier et al., 2016) and purchase intention (Prakash and Pathak, 2017). As such, researches on consumers' responses to sustainable packaging (Boz et al., 2020) and more precisely on *specific* packaging solutions (Ketelsen et al., 2020) should be investigated.

Thus, this research aims to provide a deeper insight on consumers' perceptions regarding specific sustainable packaging types and consequently the impact on their purchase intention. This study expands the existing literature regarding consumers' perceptions of sustainable packaging within the context of the food industry. It also brings additional information regarding the recognition process

consumers are implementing to identify sustainable packaging and, by extension, the measurement of their real awareness and ability to identify eco-friendly packaging (Popovi et al. 2019). Therefore, this research will contribute to a better understanding of the discrepancy identified between consumers' perceptions of packaging sustainability and the effective sustainable dimension of those packaging (Steenis et al. 2017). At a lower level, this study will also validate Monnot et al. (2015) model through replication in another fast-moving consumer good product category namely cereals.

From a managerial point of view, this research will help companies to understand how consumers perceive sustainable packaging and thus what barriers individuals are facing when shifting to greener packaging namely what are the reasons for which consumers do or do not buy fast-moving consumer goods presented under a sustainable packaging. At a more practical level, firms will obtain information regarding how to develop greener packaging that consumers will actually buy – a specific aspect rarely considered in the academic literature (Ketelsen et al., 2020). Moreover, given the strategic importance of communicating eco-friendliness of packaging (Magnier and Cri , 2015) to make consumers aware of packaging's sustainable aspects and thus increase their acceptance of such options (Ketelsen et al., 2020), this research will also provide companies on how to communicate efficiently to consumers the introduction on the market of a product presented under a greener packaging. Indeed, the literature demonstrates that consumers can misinterpret sustainable packaging elements (Steenis et al., 2017) leading to marketing failures of new green packaging (Boz et al., 2020).

In order to better understand consumers' attitudes towards sustainable packaging, the following research question will be examined: how the perception of an identical product can evolve depending on the type of packaging used in terms of quality, expensiveness, eco-friendliness, convenience and as consequently, affects consumers' attitude and its intention to purchase green packaged product?

To address this research question, firstly definitions of the key terms and theories will be analysed to ground the hypothesis of the research model that will be implemented. Secondly, an entire section will be addressing the research methodology and more specifically the aspects of data collection and data analysis. Thereafter, the findings associated with this research will be presented and compared with the ones obtained in previous studies before a discussion of the implications and limitations this research brings to the academic literature.

## 2. Theoretical framing

This section aims to understand and define the main important concepts which will be considered within this research. Thereby, a focus will be realized on the notion of “sustainable packaging” and how, given its complexity, it can become complicated for consumers to efficiently recognize sustainable packaging within a larger range of packaging.

In a second phase, a focus will be realized on the Attribution Theory (Heider, 1958) and how this framework can be used within the context of consumer behaviour and sustainability.

### 2.1. Sustainable packaging

The United Nation has defined sustainability within the Brundtland Report (1987) as “meeting the needs of the present without compromising the ability of future generations to meet their own needs”.

This notion can be applied to packaging, creating the emergence of sustainable packaging. Hitherto, there is no unique commonly accepted definition of sustainable packaging since the notion of “sustainability” does not include precise indicators to evaluate it. As a consequence, each definition considers different elements for one packaging to be considered sustainable. The principal definitions are the ones proposed by the Sustainable Packaging Alliance and the Sustainable Packaging Coalition.

The definition proposed by the Sustainable Packaging Alliance through its four principles (Table 1) distinguishes the macro-level to the micro-level (Sonneveld et al., 2005).

*Table 1 Definition of sustainable packaging according to the Sustainable Packaging Alliance*

	Sustainable packaging principle		Sustainable packaging indicator
	Concept	Concept's definition	
<b>Sustainable Packaging Alliance (Australia)</b>	Effective	Add economic and social value	Reduce product waste
			Improves functionality
			Prevents over-packaging
			Reduces business costs
	Efficient	Optimized use of materials and energy	Improves materials, energy and water efficiency
			Improves efficiency of logistics
			Reduces waste to landfill
	Cyclic	Packaging	Returnable
			Reusable
			Recyclable
			Biodegradable
	Clean	Non-risky for humans and/or ecosystems	Reduces toxicity, airborne, waterborne and greenhouse emissions

Source: Adapted from James et al. (2005) and Lewis et al. (2007)

The other widely accepted definition is the one of the Sustainable Packaging Coalition. According to their definition a “sustainable packaging

1. Is beneficial, safe and healthy for communities throughout its life cycle
2. Meets market criteria for performance and cost
3. Is sourced, manufactured, transported and recycled using renewable energy
4. Optimizes the use of renewable or recycled source materials
5. Is manufactured using clean production technologies and best practices
6. Is made from materials healthy throughout the life cycle
7. Is physically designed to optimize materials and energy
8. Is effectively recovered and utilized in biological and industrial closed-loop cycles”.

Source: *Definition of Sustainable Packaging*, Sustainable Packaging Coalition, 2011

The sustainability of one packaging is mostly measured by producers and companies through a life-cycle assessment (LCA); the LCA being a “tool for evaluating environmental effects of a product, process, or activity throughout its lifetime which is also known as a «from cradle to grave» analysis” (Roy et al., 2009). On the other hand, consumers are mainly interpreting the eco-friendliness of packaging according to the sources available and accessible to them (Van Dam, 1996), and by information conveyed by the packaging (Steenis et al., 2017). As a consequence, we are witnessing a discrepancy between the scientifically measurable sustainability of a packaging and its perception of sustainability by the consumer (Herbes et al., 2020) since certain dimension are not considering during the sustainability assessment realized by consumers (Nguyen et al., 2020).

Researchers have identified several elements related to packaging that are considered and associated with more sustainable approaches by consumers and created classifications according to their characteristics (Magnier and Crié, 2015) or the life-cycle of the product (Zeng and Durif, 2019).

Even if the classification proposed by Zeng and Durif (2019) depending on the life-cycle of the product is very interesting and highlight the gap between producers and consumers’ view of packaging modifications that can be considered as part of a greener process, the taxonomy developed by Magnier and Crié (2015) will be considered in this context.

Three categories of cues namely structural, graphical and informational cues have been identified by Magnier and Crié (2015) as influencing consumers’ perception of eco-designed packaging. Their findings regarding structural cues (Table 2) are and, as such, will be considered during the experimental design since they refer exclusively to packaging’s visually tangible aspects – all other packaging elements remain unchanged (e.g. changing the colours or the logos for the graphical cues or the environmental claims that can be associated with the informational cues present on the packaging). In order to understand and measure how consumers’ perceptions are evolving according to the different types of sustainable packaging they are exposed to, all other parameters must remain unaltered.



Table 2 Taxonomy of structural ecological cues

Structural cues	Reduction	Over-packaging reduction
		Size
		Shape
		Container enlargement
		Non-diluted products
		Unpackaged products
		Non-pre-packed products
		Eco refills
	Materials	Recycled materials
		Recyclable materials
		Biodegradable materials
		Made from renewable resources
		Material weight
	Re-usability	Re-employable container
		Reusable package

Source: Adapted from Magnier and Crié, 2015

Given the complex requirements to fulfil for one packaging to be considered as sustainable, discrepancies are appearing between consumers' perceptions and the real sustainability of packaging. Indeed, being limited in terms of available information at their disposal, consumers are not apprehending all changes regarding packaging with the same importance and consequences in terms of purchase intention and purchase behaviour.

## 2.2. Attribution Theory

The Attribution Theory (Heider, 1944) addresses the way people make sense of observed events (Kelley, 1973). In other words, this framework "attempts to describe and explain the mental and communicative processes involved in everyday explanations, most typically explanations of individuals and social events" (Manusov and Spitzberg 2008). Indeed, human beings feel the need to understand and attribute causes to events they are witnessing or behaviours they are facing (Heider, 1944) to react in consequence to them.

Originally, Heider (1944) focused his work on the perception individuals were developing towards objects and how they were attributing them qualities. From there, Heider extended the model of attribution to the individual to understand how human beings perceived other human beings and how they interpret each other's behaviour (Heider, 1958). Given that "persons have abilities, wishes and sentiments" (Heider, 1958), attributing a cause to one behaviour is more complicated in the case of an individual which explains the distinction made by Heider (1958) between personal and impersonal situation causality. This distinction enables the separation of the internal attribution of a situation from the external ones. In the case of external attribution or attribution of *outcomes* (Heider, 1958), the context and environment are responsible for the situation. On the contrary, in the case of internal attribution or attribution of *intentional actions* (Heider, 1958), the cause of the event can be related to the individual himself and his attitude. This distinction between *personal causality* and *impersonal causality* (Heider, 1958) explains the further development of the attribution theory into what is known as the situational theory and the dispositional theory.

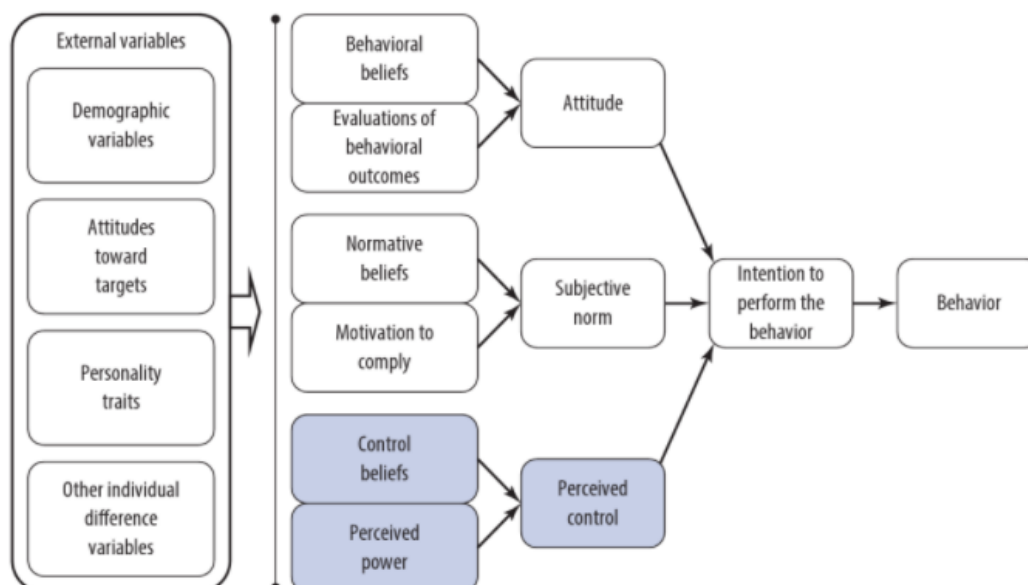
In consumer behaviour literature, the framework of Attribution Theory developed by Heider (1944) can be used to explain how individuals are assessing and interpreting information when confronted with specific stimuli to adapt their behaviour. For instance, the attribution theory has been applied to understand how individuals confronted to a change in packaging will be looking for information to analyse the situation and act accordingly namely the elimination of over-packaging on private label products (Monnot et al., 2015) and the impact of over-packaging and absence of over-packaging within a range of similar products (Monnot et al., 2019).

Within the particular context of this research, the Attribution theory (Heider, 1944) will be used to analyse how consumers are interpreting changes in the type of packaging used namely moving from traditional packaging to a sustainable one. Indeed, individuals' perceptions of a product can be affected by information and changes in information (Verbeke and Ward, 2006). Thus, interpretation and reaction to stimuli would have consequences on their purchase intention behaviour given that their perceived quality, perceived expensiveness, perceived eco-friendliness and perceived convenience will be affected by this change.

### 2.3. Alternative theory

The Theory of Planned Behaviour (Figure 1) examines the existing relationship between an individual's motivational factors and individual's behaviour (Ajzen, 1991). Based on individual psychology, the Theory of Planned Behaviour (Ajzen, 1991) can be used to better understand and predict specific individual's behaviour. Indeed, the model is based on the assumption that perceived behavioural control, subjective norms and attitudes towards the behaviour are factors composing the intention and therefore determining an individual's behaviour. Hence, the Theory of Planned Behaviour (Ajzen, 1991) is extending the Theory of Reasoned Action (Ajzen and Fishbein, 1980) which only consider the constructs of "attitudes" and "subjective norm" as determinants of the intention.

Figure 1 Theory of Planned Behaviour and Theory of Reasoned Action



Source: Glanz, Rimer and Viswanath, *Health Behavior: Theory, Research, and Practice* (2015) p.98

Note: unshaded boxes refers to the Theory of Reasoned Action

Thus, the Theory of Planned Behavior (Ajzen, 1991) has been applied in numerous fields including marketing (Ferdous, 2010; Muralidharan and Sheehan, 2016) and sustainability (Chan and Bishop, 2013; Hameed et al., 2019; Taufique and Vaithianathan, 2018) making this theory commonly used while examining consumers' behaviour towards (sustainable) products (Yadaw and Pathak, 2016; Paul et al., 2016; Maloney et al., 2014) and/or (sustainable) packaging (Wang et al., 2020; Friedrich, 2020; Orzan et al., 2018). Within the particular context of the food industry, some studies have used the Theory of Planned Behavior (Ajzen, 1991) considering a particular product category for instance beverages (van Birgelen et al., 2009; Barber, 2010; Koenig-Lewis et al., 2014) when other remained at the industry level considering food in general (Jeżewska-Zychowicz and Jeznach, 2015; Lindh et al., 2015; Martinho et al., 2015; Prakash and Pathak, 2017). Hence, the Theory of Planned Behaviour (Ajzen, 1991) can be used as an alternative theory within this research.

### 3. Research proposal

From the theoretical framework explained previously and from the packaging literature can be drawn the research model that will be implemented in this research with the corresponding hypothesis.

#### 3.1. Hypothesis

Quality, price, convenience, taste and sustainability are elements considered as important within the food industry for consumers (Steenis et al., 2017). Thus, consumers are assessing products according to the importance they establish a product's different attributes (Monnot et al., 2015). Within the particular case of fast-moving consumer goods, individuals are evaluating products through their packaging (Orth and Malkewitz, 2008; Schoormans and Robben, 1997). Indeed, packaging can influence consumers' perception of the product (Orth & Malkewitz, 2008; Becker et al., 2011) in terms of perceived quality, perceived convenience, perceived expensiveness and perceived eco-friendliness.

##### 3.1.1. Perceived quality

Perceived quality can be defined as "consumer's perception of the overall quality or superiority of a product with respect to its intended purpose, relative to alternatives" (Aaker, 2009). Thus, it is subjective (Villarejo-Ramos and Sanchez-Franco, 2005) since perceived quality is the result of an individual analysis of the product made through intrinsic and extrinsic attributes (Zeithaml, 1988).

Previous studies have shown that packaging can influence consumers' perception of a product's quality (Berkowitz, 1987; Schoormans and Robben, 1997; Venter et al., 2011; Honea and Horsky, 2012; Wang, 2013; Monnot et al., 2015). Perceived quality is perceived as stronger when the product is sustainable (Lee & Yun, 2015; McEachern & McClean, 2002) or presented under a sustainable format (Magnier et al., 2016). Hence,

**H1:** Perceived quality positively affects consumers' purchase intention

##### 3.1.2. Perceived expensiveness

Packaging can influence consumers' perceived expensiveness of a product (Inman et al., 1900) when the price has been identified as a key determinant in the purchase decision of sustainable packaging (Martinho et al., 2015). Globally, environmentally-friendly packaging are perceived as more expensive than traditional packaging (Magnier and Cri , 2015). Moreover, given that individuals are sensitive to changes in price (Erdem et al., 2002) and consumers can develop a financial risk perception if they consider a product's price as high (Orzan et al., 2018). Hence,

**H2:** Perceived expensiveness negatively affects consumers' purchase intention

### 3.1.3. Perceived environmental friendliness

The harmful impacts of plastic packaging on the environment have known an early acknowledgement from the scientific field (Arkes, 1996) when, for the civil society, this issue is gaining importance and recognition nowadays. With the increasing awareness of the population, consumers are more and more inclined to use eco-friendly packaging (Rokka and Usitalo, 2008; Martinho et al., 2015). Researches have demonstrated the existence of a relationship between the ecological awareness or environmental attitudes of an individual with his intention to buy and use sustainable alternatives (Giannelloni, 1998; Bickart and Ruth, 2012; Kilbourne and Pickett, 2008).

However, consumers have an imperfect vision of the packaging' environmental aspects (Steenis et al., 2017; Herbes et al. 2020; Nguyen et al. 2020) given the limited sources of information they dispose of (van Dam, 1996). Therefore individuals base their environmental assessment of packaging on the visual and verbal ecological elements at their disposal (Magnier and Crié, 2015) and the packaging's material (Monnot et al., 2019; Steenis et al., 2017; Lindh et al., 2016). Indeed, academic studies have found that the material choice of a packaging impact consumers' perceived sustainability of the product considered (Monnot et al., 2019; Steenis et al., 2017; Lindh et al., 2016). Hence,

**H3:** Perceived environmental-friendliness of packaging affects consumers' purchase intention

### 3.1.4. Perceived convenience

Convenience can be defined as "something easy to obtain, use or reach" (Word Reference Dictionary) thus it refers to consumers' level of effort needed in the acquisition of a product (Scholderer and Grunert, 2005) which includes, for instance, the dimension of time effort and cost effort.

Studies have found that convenience can impact consumer's behaviour (Kelley, 1958). Moreover, changes in consumption habits and lifestyles explains consumers' search for greater convenience when purchasing products (Draskovic, 2010). One way to achieve greater convenience for consumers is buying a product in packaging perceived as convenient for them. According to Mortimer (1955) packaging convenience can influence convenience; explaining why most items available for purchase nowadays are presented package. Therefore convenience is a packaging's function alongside with transportation (Rundh, 2005) or health guarantees (Argo et al., 2006)

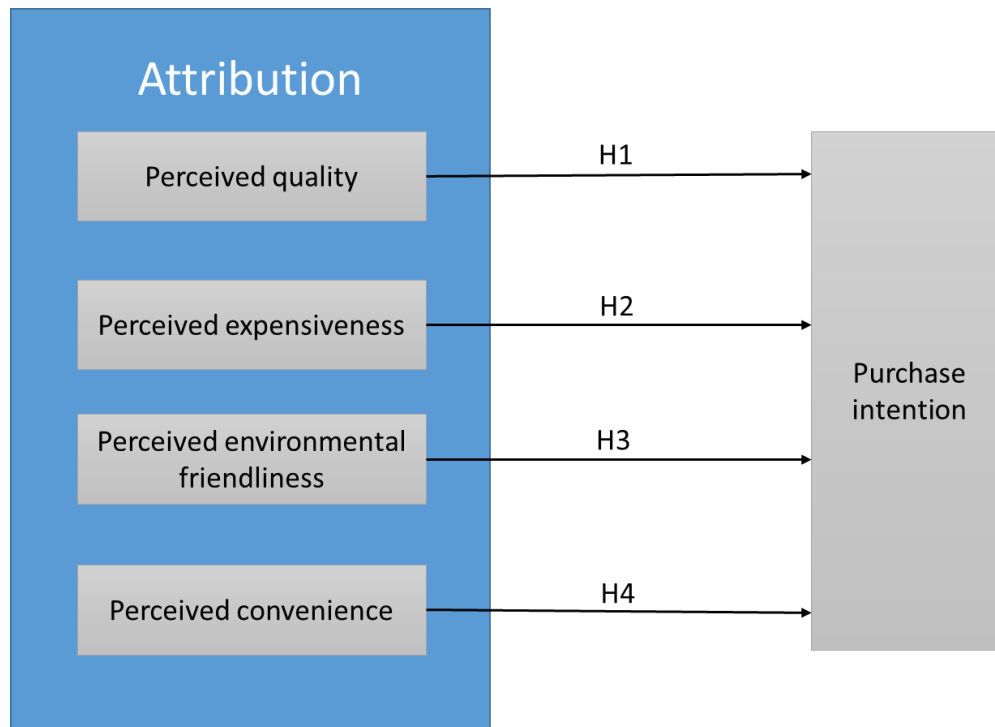
Packaging convenience is mainly perceived by consumers through packaging material, packaging size and packaging type of closure (Draskovic, 2010). Thus, changes in packaging's shape, size or specific features can improve consumer's perceived convenience of packaging (Draskovic, 2010) and therefore influence consumers' purchase intention (McDaniel and Baker, 1977; Olsen et al., 2007; Olsson and Györei, 2002). Regarding the specific segment of green consumption, studies have found packaging's convenience as an influential factor in the purchase intention (Hao et al., 2019). Hence,

**H4:** Packaging's perceived convenience affects consumers' purchase intention

## 3.2. Research model

Given the academic literature, the following research model (Figure 2) is developed for this study.

*Figure 2 Conceptual research model*



Source: Adapted from Monnot et al. (2015) and Heider (1948)

This conceptual research model stems from the Attribution Theory (Heider, 1948). Developed to explain the process implemented by individuals when subject to specific stimuli, this theory brings light on the attributes associated with specific sustainable packaging by individuals. Therefore, consumers' perception of quality, expensiveness, environmental friendliness and convenience of a product might change depending on the format under which it is presented. Hence, consumers' purchase intention for the same product might differ according to the packaging under which it is commercialized.

Respondents' demographic characteristics will be considered during the data analysis since some studies found that age, gender and religion are factors that might influence individual's purchase intention for green products (Laroche et al., 2001; Martinho et al., 2015; Prakash and Pathak, 2017; Hao et al., 2019; Raab et al., 2020).

Conceptual research model's hypothesis are summarized in Table 3.

*Table 3 Hypothesis review*

H1	Perceived quality positively affects consumers' purchase intention
H2	Perceived expensiveness negatively affects consumers' purchase intention
H3	Product's perceived environmental-friendliness affects consumers' purchase intention
H4	Packaging's perceived convenience affects consumers' purchase intention

### 3.3. Literature review table

This subsection summarizes some of the academic papers taken into considering within this study.

Authors	Year	Title	Contributions
Boz, Korhonen & Koelsch Sand	2020	Consumer considerations for the implementation of sustainable packaging: A Review.	The discrepancy between consumer's perception of sustainability and the actual sustainability of packaging can lead to the failure of green packaging in the market. More research should be conducted on the effect of sustainable packaging on consumer decisions and better communication around green packaging must be implemented to counter-effect the behavioural barriers related to the purchase of sustainable packaging.
Ketelsen, Janssen & Hamm	2020	Consumers' response to environmentally-friendly food packaging-A systematic review.	Results are heterogeneous regarding how consumers perceive and act towards environmentally-friendly packaging given it is a recent research field that requires more researches. The aspect of consumer awareness regarding sustainable packaging must be developed to understand consumers' responses to <i>specific</i> packaging solutions (and not environmentally-friendly packaging in general) and draw conclusions on the reasons why consumers are accepting or not such packaging ("empirical knowledge on measures for overcoming these barriers are scarce"). Communication is necessary for consumers to recognize eco-friendliness packaging's aspects since they are mainly basing themselves on the material used, claims, logos and packaging design elements to measure it.
Steenis, van Herpen, van der Lans, Ligthart & van Trijp	2017	Consumer response to packaging design: The role of packaging materials and graphics in sustainability perceptions and product evaluations.	Recommend studies to focus on the understanding of how specific sustainable packaging design element and material can affect behaviour towards those sustainable packaging. Consumers' perception of packaging sustainability is significantly different from the LCA assessment of those packaging given that consumers principally based his perception on cues either structural or material. Moreover, each consumer might have a different perception given each individual consider different aspects and can be misled by the various cues. Incorporating sustainable aspects in packaging can affect consumers' perceptions of product sustainability as well as the perceived price and quality and thus lead to trade-offs.
Sonneveld, James, Fitzpatrick & Lewis	2005	Sustainable packaging: how do we define and measure it.	Presentation and discussion of different definitions of sustainable packaging including the one proposed by the Sustainable Packaging Alliance.
Sustainable Packaging Coalition	2011	Definition of sustainable packaging.	Definition of sustainable packaging according to the Sustainable Packaging Coalition



Plastic Atlas	2019	Plastic atlas 2019: Facts and figures about the world of synthetic polymers	Contextualization of the plastic situation worldwide and per sector in 2019
AISBL	2020	Plastics—the Facts 2019	Plastic definition and categorization, contextualization of the plastic industry in terms of key numbers in 2019 worldwide and within Europe
Nguyen, Parker, Brennan & Lockrey	2020	A consumer definition of eco-friendly packaging.	Categorization of eco-friendly packaging under three dimensions: packaging materials, market appeal and manufacturing technology. Consumers have different perceptions of sustainable packaging but mainly refers to packaging materials and market appeal to assess the eco-friendliness of a packaging. They generally do not consider the aspect of manufacturing technology explaining the discrepancy between the objective and subjective sustainability of packaging.
Malle	2011	Attribution theories: How people make sense of behavior.	Presentation, contextualization and explanation of the Attributional Theory; the distinction between object and person perception, between variance and invariance and between personal and impersonal causality
Magnier, Schoormans & Mugge,	2016	Judging a product by its cover: Packaging sustainability and perceptions of quality in food products.	Sustainable packaging has an influence on consumers' perceived quality even when no information is mentioned regarding the product's sustainability. Intrinsic product sustainability elements also have an impact on the perceived quality of the product. Items for perceived quality and perceived environmental friendliness
Magnier & Crié	2015	Communicating packaging eco-friendliness.	Taxonomy of ecological cues into structural, informational and graphical cues resulting from in-depth interviews. The distinction between the intrinsic and extrinsic nature of ecological cues. As such, effective environmental-friendly communication should avoid the multiplication of claims that might mislead consumers.
Magnier & Schoormans	2015	Consumer reactions to sustainable packaging: The interplay of visual appearance, verbal and environmental concern.	Examine how consumers analyse the visual appearance and verbal claims can impact consumers' behaviour to purchase sustainable packaging. Attractiveness was found as an important variable and as such must be considered by companies when developing new sustainable packaging. Consumers use visual elements material and colour to define packaging as a sustainable.
Monnot, Parguel & Reniou	2015	Consumer responses to elimination of overpackaging on private label products.	Consumers' are perceiving differently a product quality, expensiveness, environmental friendliness and convenience depending on the packaging presented to them. Product's perceived quality, eco-friendliness, and convenience are impacted differently depending on the type of packaging used and on the type of label. Items

Van Dam	1996	Environmental assessment of packaging: The consumer point of view.	Consumers and producers assess differently the sustainability aspect of a packaging given they do not use the same source of information. For instance, consumers' analysis is mainly based on the consumption and post-consumption of the packaging when the LCA also consider the production phase; explaining the discrepancy between both actors and the resistance of consumer when changing packaging. Returnable glass is the material considered as the more sustainable material from consumer' point of view since consumers mainly judge the sustainability of a product from the packaging' material and the eventual returnability aspect of it.
Steenis, van der Lans, van Herpen & van Trijp	2018	Effects of sustainable design strategies on consumer preferences for redesigned packaging.	Redesigning a product's packaging can influence consumers' responses and perception of the product. Indeed, when the strategy has for purpose to make a packaging seen as more sustainable, consumers will develop higher perceived sustainability and thus change their purchase intention. The study demonstrates that perceived sustainability and naturalness have strong effects on purchase intention. Items for perceived convenience
Wang	2013	The influence of visual packaging design on perceived food product quality, value, and brand preference.	Demonstrates existence relationship between perceived quality and perceived value in the food industry. Attitudes towards packaging directly influence consumers' perceived quality. Packaging must be designed to create in consumers' mind positive perceptions. Items
Martinho, Pires, Portela & Fonseca	2015	Factors affecting consumers' choices concerning sustainable packaging during product purchase and recycling.	This study investigates the correlation between consumers' preference for sustainable packaging and consumers' behaviour in terms of recycling considering the discrepancy existing between consumers' perception of eco-friendly packaging and the real sustainability of packaging on one hand and the intention gap behaviour on the other side. Environmental awareness and gender are factors affecting consumer behaviour regarding sustainable packaging in the purchase decision and after the purchase decision. Prices, quality and functionality are important features during consumers' selection process.
Koenig-Lewis, Palmer, Dermody & Urbye	2014	Consumers' evaluations of ecological packaging—Rational and emotional approaches.	The study conducted in Norway demonstrates the existence of a relationship between consumers' environmental concern and their purchase intention. Rational approaches used by consumers do not impact the purchase intention when emotion does regardless if they are positives or negatives. Items for environmental friendliness

Scott and Vigar Ellis	2014	Consumer understanding, perceptions and behaviours with regard to environmentally friendly packaging in a developing nation	Environmental awareness has a direct and indirect impact on consumers' purchase intention of sustainable products. South African have difficulties differentiating traditional packaging from sustainable one since their definition of "environmentally friendly packaging" remains broad. Gender and age had no influence on the definition and understanding of "environmentally friendly packaging" reinforcing the conflicting literature regarding the existence (or non-existence) of a relationship between age and environmental behaviour on one hand and gender and environmental behaviour in another. Associated of the notion of "saving money" with green packaging.
Prakash & Pathak	2017	Intention to buy eco-friendly packaged products among young consumers of India: A study on developing nation	Personal norms can strongly impact on consumers' attitudes towards sustainable packaging. Environmental awareness and concern and attitudes can also change individuals' purchase intention of such product according to the findings of the study. The authors found that young consumers are inclined to pay more for green products meaning that the factor of age is impacting consumption of green products here.
Herbes, Beuthner and Ramme	2018	Consumer attitudes towards biobased packaging—A cross-cultural comparative study.	Environmentally friendly attributes of packaging can influence consumers' perceived sustainability of the product and therefore consumers' purchase intention. According to the country, consumers are perceiving as more sustainable different packaging even if overall they all focus on the end-of-life attributes and thus do not consider the other step of the packaging. Cultural differences exist when some misconceptions remain regarding certain specific sustainable packaging.
Hao, Liu, Chen, Sha, Ji, and Fan	2019	What affects consumers' willingness to pay for green packaging? Evidence from China.	Green packaging quality, packaging price, environment and commodity have been found to be factors affecting consumers' willingness to pay. The convenience, protection function and reusability of the sustainable packaging are found to be more important compared to other factors such as price or visual appearance. Those findings have been revealed when consumers have in reality small knowledge regarding environmental-friendly packaging. Items for perceived convenience.

## 4. Methodology

This section depicts the research methodology that will be used in order to conduct this research. A presentation of the research design, sample group and context of the empirical research will be introduced before describing the procedures that will be implemented for data collection and analysis.

### 4.1. Research design, sample description and context

Given the already existing literature on packaging and its impacts on consumers' behaviour and considering the objectives of this research, a choice experiment will be conducted in order to analyse and measure consumers' perceptions of sustainable packaging.

This empirical research will be conducted online given it will be more time effective, will reduce social biases including the desirability bias. In order to reduce the social desirability bias, the introduction of the choice experiment will not mention the real objective of the research i.e. the understanding and measurement of consumers' perceptions of sustainable packaging but it will instead mention that the research is related to the domain of packaging in general.

Developing a choice experiment will also make comparisons possible between the different groups. Indeed, experiments enable higher-quality information given that individuals, within each group, are subject to a single packaging with the exact same set of information and, as such, only consider the packaging they presented to them and do not adjust their answers as it could be the case during questionnaire in which participants are presented more than one packaging option. Finally, conducting this empirical research online would satisfy the sanitary requirements currently in place in France.

The target group for this research will be adults consuming regularly the product under consideration within the French market and which are presenting an involvement towards the product. Thus responds could be French citizens or foreigners living or having lived in France in the past year and that are buying and consuming or susceptible to buy and consume regularly the product analysed.

The product brought under consideration for the choice experiment will be cereals since it represents an important product category, consumers are frequently buying cereals, the actual packaging can be improved in terms of sustainability and changes are to be expected in the following months. Indeed, cereals are part of the breakfast universe which have known an increase of 3.1% of its turnover at the end of May 2020 according to IRI for the French market hypermarkets and supermarkets taken together (Lavabre in LSA, 2020). To be more precise, there has been an increase of 40% in cereals sales since March 2020 (Lavabre in LSA, 2020). Nowadays, cereals packaging are mainly made of non-recyclable plastics bag as primary packaging and non-recycled carton as selling unit packaging. Given the frequency on which consumers are buying cereals, cereals' actual packaging generates a large amount of waste; thus, improvements can be made. For instance, Nestlé is the third company worldwide generating the greatest metric tonnes of plastic packaging in 2020 (Statista).

Cereals are not only a market rising but also a product category that is knowing important changes. "[Kellogg's] priority today is the cereals category" as mentioned by François Rouilly, Kellogg's general director France in LSA. Indeed, the main player in the French market namely Kellogg's and Nestlé which represent respectfully 39.7% and 24.2% of the market (Lavabre in LSA, 2019) have developed a strong commitment towards sustainability.

On one hand, Kellogg's as part of its Sustainability 2020 goals have changed cereals packaging into recycle-ready materials end of 2019, is decreasing packaging weight when possible and is developing alternatives to avoid plastic packaging (Kellogg's, Global Sustainable Packaging Milestones 2019). Another action coordinated by Kellogg's is the implementation of new business models. For instance, Kellogg's is experimenting since June 2020 into partner French supermarket the development of a bulk section where consumers would be able to buy the exact amount of Kellogg's they desire while using sustainable containers.

On the other hand, Nestlé has created the Institute of Packaging Sciences to develop environmentally-friendly packaging that provides high functionality to its users and guarantees protection while using it. The company, according to its annual report of 2019, continue its work regarding the development and launch into the market of sustainable packaging options. Indeed, Nestlé aims to make its packaging 100% recyclable or reusable by 2025 (Nestlé, Annual Report 2019). Thus, "[Nestlé is] eliminating unnecessary packaging and phasing out materials that are not recyclable or are hard to recycle" (Nestlé, Improve packaging performance) and is also experimenting on alternative systems to avoid plastic use in packaging (Nestlé, Creating shared value and meeting our commitments Progress report 2019). The company is currently assessing the viability of developing a packaging return system in France using a system similar than Loop.

As the results of those strong commitment developed by the main cereals brands, the development of more sustainable packaging is appearing in French supermarkets' shelves. Those new packagings are playing of several aspects considered as structural cues according to the taxonomy developed by Magnier and Crié (2015).

#### 4.2. Data collection procedures

Participants will be randomly assigned to one of the three groups namely the control group, the treatment group one or the treatment group two. The size of each group is expected to be superior to sixty respondents. All respondents will be presented a packaging visual representation completed with additional information before responding to a self-administrated questionnaire (Table 4).

The data collection will be realized online when the questionnaire will be designed and diffused with the software Sphinx Declic. As mentioned previously, the introduction of the questionnaire designed for the three groups will not include the real purpose of the research in order to reduce social desirability.

*Table 4 Experiment design*

Group	Treatment			Questionnaire
	Traditional	Packaging 1	Packaging 2	
Group control	X			X
Group 1		X		X
Group 2			X	X

The questionnaire will aim to measure the main constructs namely perceived quality, expensiveness, convenience and environmentally-friendliness and purchase intention for each packaging elected. A section will be dedicated to identify respondents' profile namely their sociodemographic factors.

The choice experiment and its items will be designed in English before being translated to French given that the questionnaire is destined to be mainly spread among French consumers. Translating it will facilitate the answer's rate since it will provide better convenience to respondents and avoid misinterpretation in the different questions. Translation will be realized and revised by a native speaker. Comprehensibility of each question will be tested.

A pre-test will be conducted on a limited sample to ensure the correct implementation of the instruments and as such, that the experiment will allow the measurement of consumers' perception of product presented under different specific packaging in terms of perceived quality, perceived expensiveness, perceived environmental friendliness and perceived convenience.

This pre-test will also be used to understand how to sequence the different questions to minimize consumers' bias while filling the questionnaire. This phase will lead to adjustments and improvements before the spread of the questionnaire which can include the replacement of an item, reformulation in English of a question, improvement of the translation, etc.

A 5-point Likert scale will be implemented for each construct in order to have a greater response rate and greater reliability in the collected answers while offering a neutral option. As such, the following scale will be used for each construct:

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

Items used to measure the construct of perceived quality (for buying the presented good.

*Table 5*), perceived expensiveness (

Table 6), perceived environmental-friendliness (Table 7) and perceived convenience (Table 8) are summarized below. Table 9 refers to consumers' purchase intention for buying the presented good.

*Table 5 Items measuring perceived quality*

#	Source	Original item	Adaptation
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1	Magnier et al., 2016	All things considered, I would say that these chocolate bars are globally of ..	All things considered, I would say that this product is globally of...
2	(7 quality Likert Scale)	These chocolate bars seems to have ...	This product seems to have a ...
3		Globally, this product seems ...	Overall, this product seems...

*Table 6 Items measuring perceived expensiveness*

#	Source	Original item	Adaptation
1	Monnot et al., 2015	Compared to others, this product looks more expensive to me	Compared to others, this product looks more expensive to me
2	(5 Likert Scale)	This product is certainly more expensive than average	Presented under this form, this product is certainly more expensive than average

*Table 7 Items measuring perceived environmental friendliness*

#	Source	Original item	Adaptation
1	Chen et al., 2015 (7 Likert Scale)	I believe that this product is environmentally friendly	I believe that this product is environmentally friendly
2		I believe that using this product can reduce environmental impact	I believe that using this product can reduce environmental impact
3		Compared to other similar product, this product is more environmentally-friendly	Compared to other similar product, this product is more environmentally-friendly

*Table 8 Items measuring perceived convenience*

#	Source	Original item	Adaptation
1	Steenis et al., 2018 (7 Likert Scale)	I expect that this new packaging to protect the product well	I expect this packaging to protect the product well
2		I expect that this new packaging function well	I expect this packaging to function well

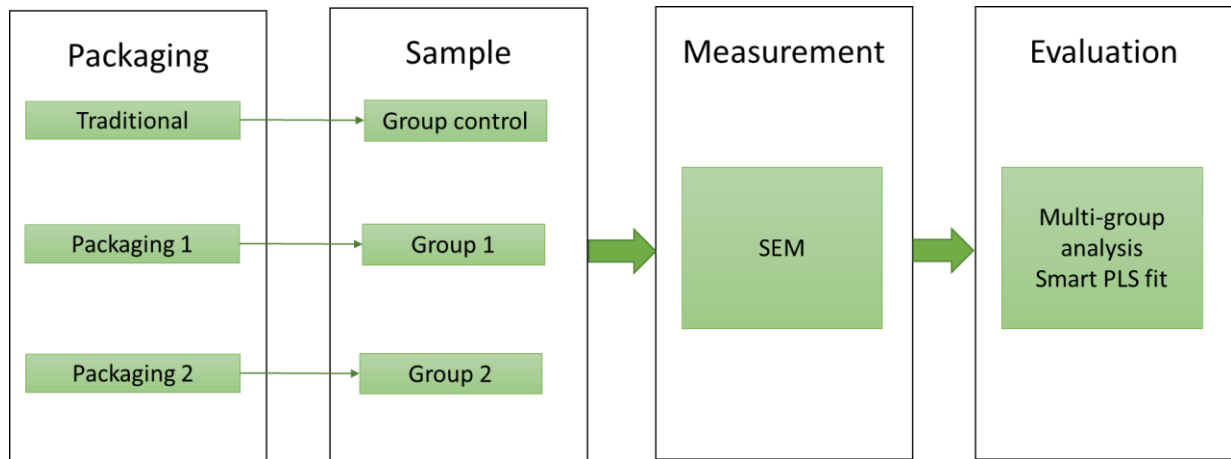
*Table 9 Items measuring purchase intention*

#	Source	Original item	Adaptation
1	Steenis et al., 2018 (7 Likert Scale)	My willingness to purchase a shower gel in this packaging is ....	My willingness to purchase muesli in this packaging is ...
2		The chance I would buy shower gel in this packaging if it were available is ...	The chance I would buy muesli in this packaging if it were available is
3		The likelihood that I would actively search for a shower gel in this packaging is ...	The likelihood that I would actively search for muesli in this packaging is...

#### 4.3. Data analysis procedures

The data collected (Figure 3) through the choice experiment will be analyzed under a Structural Equation Modelling (SEM) to obtain a multi-group analysis in order to measure consumers' perception among the different specific type of packaging and analyze their degree of awareness regarding sustainable packaging.

*Figure 3 Data measurement and evaluation*





## 5. Expected contributions and limitations

This research aims to provide a deeper knowledge of consumers' perception formation regarding specific sustainable packaging in the food industry. Indeed, given the multiple definitions proposed for "sustainable packaging" and, as such, the non-consensus around it, studies have mainly studied environmentally-friendly packaging in general and not specific packaging solution (Ketelsen et al., 2020). Through this choice experiment addressing the French market, consumers dynamics associated with specific sustainable packaging will be addressed. Indeed, given that the product remained constant over time and only packaging design have been modified, the perceptions consumers have formed regarding the product can be linked to specific aspects of their interpretation (Steenis et al., 2017). Consumers are attributing different perception and interpretation of the same product, confirm the importance of the application of the Attribution Theory within the context of consumer behaviour (Monnot et al., 2019).

From a managerial point of view, those results will provide information to companies regarding drivers and barriers individuals are facing when desiring to shift toward greener packaging and, as such, how they could develop sustainable packaging that consumers will actually buy. This study will also bring greater knowledge regarding types of consumers' preferences meaning what are the existing types of consumers and how should firms communicate according to their preferences. At a lower level, this study will also contribute to the academic literature regarding consumers' awareness of sustainable packaging. Indeed, the internal factor of "awareness" has been understudied (Popovi et al., 2019) when misconceptions have been witnessed between consumers' perception of sustainable packaging and their actual sustainable aspects (Steenis et al., 2017).

However, this experiment does not come without limitations. First, only two specific types of packaging have been examined during this choice experiment making it complicated to assess consumers' perceptions of other specific types of packaging. The choice experiment was conducted on a single product and even if the results found can be applied to similar products included products belonging to close product categories; conclusions cannot be generalized. Thus, further research should be conducted in different product categories to have a better understanding of French consumers' reception of sustainable packaging. Indeed, this analysis was focusing on the level of the French market, making it impossible to understand how other markets can react to the introduction of specific sustainable packaging within their market.

Moreover, respondents were only provided with one visual representation of the different specific sustainable packaging when literature has shown that materials enhance consumers' perception of a product. Therefore, experiments with real prototypes of products to allow individuals to touch and manipulate the different packaging should be conducted to confirm the results found within this research. The incorporation of real context should also be considered given that consumer choice behaviour is influenced by the context in which individuals are (Bettman et al., 1998).

## 6. Overview of chapters

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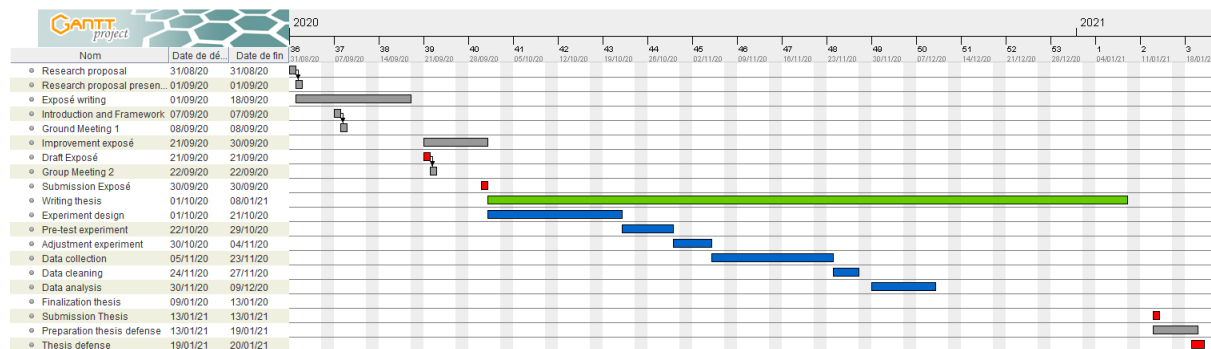
Bibliography

Appendix

## 7. Plan of work

Figure 4 GanttFigure 4 presents the intended schedule for the master's thesis regarding consumers' perceptions of sustainable packaging in the food industry that will be conducted this semester.

Figure 4 Gantt Diagram



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