

ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF SCIENCE
ENGINEERING AND TECHNOLOGY

**THE ROLE OF DESIGN IN SUSTAINABLE CONSUMPTION: A STUDY ON
SUSTAINABLE FOOD PACKAGING**

M.Sc. THESIS

Haleh BARMAKI

Department of Industrial Design

Industrial Design Programme

JUNE 2012

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Haleh BARMAKI
(502091937)

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Industrial Design Program

Thesis Advisors: Prof.Dr. Seil ŐATIR
Co- Advisor: Assoc.Dr. Őebnem TİMUR ÖĞÜT

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SUSTAINABLE FOOD PACKAGING**

YÜKSEK LİSANS TEZİ

**Haleh BARMAKİ
(502091937)**

Endüstriyel Tasarımı Anabilim Dalı

Endüstriyel Tasarımı Programı

**Tez Danışmanı: Prof.Dr. Seçil ŞATIR
Eş Danışman:Doç.Dr. Şebnem TİMUR ÖĞÜT**

HAZİRAN 2012

Haleh Barmaki a M.Sc. student of ITU **Graduate School of Industrial Design** student ID **502091937** successfully defended the **thesis/dissertation** entitled “**THE ROLE OF DESIGN IN SUSTAINABLE CONSUMPTION: A STUDY ON SUSTAINABLE FOOD PACKAGING**”, which he/she prepared after fulfilling the requirements specified in the associated legislations, before the jury whose signatures are below.

Thesis Advisor : **Prof.Dr. Seçil ŞATIR**
Istanbul Technical University

Co-advisor : **Assoc. Prof. Dr. Şebnem TİMUR ÖĞÜT**
Istanbul Technical University

Jury Members : **Prof. Dr. Özlem ER**
Istanbul Technical University

Asst.Prof. Dr. Çiğdem KAYA
Istanbul Technical University

Dr. Orhan IRMAK
Orhan Irmak Design Consultancy

Date of Submission: 4 May 2012
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To Mr. Doğan ERBERK,

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Haleh BARMAKI

(Industrial Designer)

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ABBREVIATIONS

ASD	: Ambalaj Sanayicileri Derneği-Packaging Manufacturers Association
CSD	: Commission on Sustainable Development
DFE	: Design for Environment
FSC	: Forest Stewardship Councils
IMB	: Information-Motivation-Behavior Skills
LCA	: Life-cycle Assessment
NCC	: National Consumer Council
NGO	: Non-Governmental Organization
SDC	: Sustainable Development Commission
SPC	: Sustainable Packaging Coalition
SPI	: Society of Plastic Industry
TBL	: Triple Bottom Line
UN	: United Nations
UNCED	: United Nations Conference on Environment and Development
UNCSD	: United Nations Commission on Sustainable Development
UNDP	: United Nations Development Program
UNEP	: United Nations Environment Program
WBCSD	: World Business Council for Sustainable Development
WCED	: World Commission on Environment and Development
WPO	: World Packaging Organization
WSSD	: World Summit on Sustainable Development

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THE ROLE OF DESIGN IN SUSTAINABLE CONSUMPTION: A STUDY ON SUSTAINABLE FOOD PACKAGING

SUMMARY

The food packaging waste has become one of the sources that has detrimental effects on environment. These effects are increasing with lack of consumers' information regarding sustainable lifestyle. For minimizing the environmental impacts, a solution can be presenting sustainably designed food packages to consumers.

Hereby, this study analyzes the role of design on food packages through packaging design elements and the way it can guide consumers to sustainable consumption. As consumers play significant role in consumption behavior patterns, this study investigates consumers' attitudes toward food package samples.

In this study, observations and interviews are carried out in five phases. The research starts with a Pilot Study on 45 students in order to gain primary data on food consumption and attitudes regarding food packages. Second phase includes an observation based on a food package that is observed in Finnair Airlines. The third phase continues with an interview with product development manager of Finnair Airlines' food package producer (Finncatering Company). This phase also includes some food packages samples that are presented by Finncatering Company. Forth phase (main phase) includes a semi-structured interview-based questionnaire on 65 students. The questionnaire is administrated to 30 female and 35 male university students between ages 25-34. The aim of this phase is to obtain the attitudes of sample group regarding package samples (of previous phase). In deciding the participants' frame, the variables of socio-economic and education levels are kept homogeneous. Participants are chosen as university students as they tend to be more aware of environmental issues. This finding is also consistent with research that has found younger persons hold greater attitudinal concern for environmental issues.

The focus of the questionnaire is how design in food packages can guide consumers to sustainable consumption based on package design elements such as color, material, text and image/illustration.

The interview-based questionnaire results are examined both qualitatively and quantitatively. Finalizing the study, obtained results are used in creating a meaningful picture of the study.

The results demonstrate that design has a powerful role in guiding consumers to sustainable consumption in case each package design element has been designed environmental oriented. Moreover, package designers have an important role in informing consumers about sustainability. With combining the package design elements and sustainable packaging design guidelines, consumers' awareness regarding sustainable consumption can be boosted.

SÜRDÜRÜLEBİLİR TÜKETİMDE TASARIMIN ROLÜ: SÜRDÜRÜLEBİLİR GIDA AMBALAJLARI ÜZERİNE BİR ÇALIŞMA

ÖZET

1960'lı yıllardan itibaren dünya gündeminde ekolojik sorunlar artmaya başlamıştır. Bu sorunların örnekleri olarak asit yağmurları, küresel ısınma ve ozon tabakasının aşınması ve bunlar gibi doğa felaketleri her geçen gün daha da artmaktadır.

Son yıllarda ekolojik dengenin bozulmasında insanın üretim tarzları ve tüketim alışkanlıklarının, büyük bir payı olduğu tespit edilmiştir. Üretim tarzı kapsamında, ürün yaşam evrelerinin düşünülmesi ve ona göre tasarım yapılabilmesi önem taşımaktadır.

Ambalaj tasarımı ürün tasarımının önemli ve gerekli bir parçası olmaktadır. Fakat günümüzün tüketim alışkanlığı, ürün ambalajlarını doğa'ya hasar verdiği öne sürülmektedir.

Bu çalışma literatür'de, çevreye en çok zarara sahip olan ve çokça bahsi geçen "gıda ambalajları" üzerine dayanmaktadır. Gıda ambalajları, gıdayı kapsamak ve korumak görevine sahiptirler. Ancak, gıdanın insanların temel ihtiyaçları olduğundan dolayı, diğer ihtiyaçlarına kıyaslandığı zaman her toplumda en çok tüketilen madde olmaktadır. Bu nedenle, ambalaj tasarımcısının görevi gıda ambalajlarının çevreye en az zarar verecek şekilde tasarlamaktır.

Bu çalışma boyunca, sürdürülebilir ambalaj tasarımı için ambalaj tasarımı elementlerine göre tasarlamak önerilmektedir. Bu elementler renk, malzeme, yazı ve illüstrasyon/ resimden oluşmaktadır.

Bu çalışma niteliksel araştırma olduğundan dolayı 5 aşamada gerçekleşmiştir. Birinci aşama, pilot çalışma olup, internet üzerinden anket temelli 45 İstanbul Teknik Üniversite öğrencisine uygulanmıştır.

Pilot çalışma 3 temel konudan oluşmaktadır. Birinci konuda, katılımcıların genel olarak gıda seçimlerini, ikincisi ise; bu seçimde nelere dikkat ettiklerini ve üçüncüsü ise; ambalaj üzerinde çevreci öğelere yaklaşımlarını ölçmektedir. Bu aşamanın sonuçları katılımcıların hızlı gıda tüketimine yöneldiklerini, ambalajlarda renk, imaj, malzeme ve yazılara dikkat ettiklerini ortaya koymaktadır.

Pilot çalışma sırasında, Finlandiya – Aalto Üniversitesi'nde Erasmus öğrencisi olmaktan dolayı, araştırmaya Finlandiya'da devam edildi.

İkinci aşama, planlanmamış bir şekilde, "Helsinki"den "Paris" e yolculuğu kapsamaktadır. Bu aşama "Finnair Airlines" da gerçekleşen bir gözlem sonucudur. Bu gözlemin araştırmaya yansımaları nedeni ise, uçak'ta sunulan gıdanın, ilk aşamanın (Pilot çalışmanın 3 sorusuna) sonuçlarına tamamen uyum sağlaması idi. Sonuç uyumunda, yinede 'Finnair Airlines' da hızlı gıdanın sunulması ve bu gıdanın sürdürülebilir ambalajlarda yer verilmesinden bahsedilebilir. Bu nedenle, gözlem sırasında not alındı ve fotoğraflarla belgelendi.

İkinci aşamanın, diğer önemli parçası, uçakta sunulan gıdanın ambalaj tasarımı olmaktadır. Bu nedenle, ambalaj üzerinde yazılan üretici firmanın - Finncatering Firması - iletişim bilgileri de not edildi.

Finlandiya'ya ulaştıktan sonra, üçüncü aşamaya geçilerek, Finncatering firması ile irtibat kuruldu ve bir görüşme (röportaj) ayarlandı.

Bu görüşme, firmanın ürün geliştirme müdürü ile gerçekleşti. Görüşme Finnair Airlines'in nasıl ve kimlerin tarafından bu ambalaj tasarımlarına yol açtığını kapsamaktadır. Görüşmenin son kısmında ise, Finncatering firmasının Finlandiya'nın dışında, diğer ülke firmalarından numune olarak aldığı ambalajlar üzerine tamamlandı.

Toplam olarak 8 ambalaj üzerinde görüşme yapıldı.

Bu ambalajlar, yukarıda anlatılan tasarım elementleri açısından birbirinden farklılardı.

Araştırmanın amacı, bu elementlerin kullanıcıları sürdürülebilir tüketime yönlendirmeyi denetlemesinden dolayı, üçüncü aşamada gösterilen 8 ambalajdan, üç tanesi seçildi; seçim, birbirinden üç farklı ambalajı içermekteydi.

Birincisi, gerçekten sürdürülebilir ambalaj olan ve öyle de görünen (Ambalaj 1); ikincisi, sürdürülebilir olan ama, öyle görünmeyen (Ambalaj 2) ve üçüncüsü ise sürdürülebilir ambalaj olmayıp ve öyle görünmeyen (Ambalaj 3) gibi farklardan oluşmaktadır.

Dördüncü seçenek, sürdürülebilir olmayıp ve öyle görünen ambalajın olmasıdır. Fakat Finncatering firması ile yapılmış olan görüşmede bu seçeneği kapsayan ambalaj veya ambalajların gösterilmediği için göz ardı edildi.

Üçüncü aşamada ambalaj seçiminden sonra, kullanıcıların sürdürülebilir ambalajların seçimi ve onlara karşı bakış açılarını anlamak ve denetlemek amacıyla, görüşme odaklı bir anket hazırlandı.

Bu görüşmeye dayanan anket, (esas araştırma) dördüncü aşama olup, 65 İstanbul Teknik Üniversite öğrencisi üzerinde uygulandı.

Görüşmenin soruları kişisel sorular ve katılımcıların seçimlerine dayalı iki anlatım odaklı sorudan oluşmaktaydı.

Birinci soru, ambalajlarda sunulan sandviçlerin hepsinin aynı olduğunu söyleyerek (marka, içerik, fiyat ve boyut) katılımcılardan bir seçim yapmaları istendi. İkinci soruda ise, doğaya zarar vermeyen bir ambalaj seçimi yapmaları istendi.

Bir hafta içinde tamamlanan dördüncü aşama, İstanbul Teknik Üniversitesi'nin (Ayazağa Kampüsü) kütüphanesi önünde, öğrencilerin daha çok vakit ayırabilecekleri bir ortamda sağlandı.

Ambalaj seçimini daha gerçekçi gösterebilmek için üçüncü aşamadan elde edilen ambalajların içine sandviç maketi konuldu.

Bu aşamadan, elde edilen sonuçlar, katılımcıların yukarıda bahsedilen ambalajlardan hangisini seçmek istediklerinin ve nedenlerinin açığa çıkarılmasıdır.

Elde edilen bilginin, analizi için beşinci aşamaya geçilerek, 65 katılımcının ses kayıtları alındıktan sonra, onları çözüp ve etiketlere aktarılması ile sonuçlandı.

Analiz sonucunda, öğrencilerin çoğunun sürdürülebilir olup ve öyle görünen ambalajı seçtikleri (Ambalaj 1) bilgisi elde edildi.

Bu öğrencilerin seçim nedenlerinin, onların bahsettikleri bazı sıfatlar (doğal gibi, renk gibi) ya da ambalaj tasarım elementlerine dayalı geri dönüştürülebilir bazı malzemeler oldukları ortaya çıkarıldı.

Diğer taraftan, katılımcıların seçmedikleri diğer iki ambalaja (Ambalaj 2 ve Ambalaj 3) karşı fikirleri ve onları seçmeme nedenleri analiz edildi.

Yazı, ambalaj tasarımının önemli bir elementi olup ve diğer elementlerle (renk, malzeme, illüstrasyon/ resim, logo) algılayış süreci farklıdır.

Başka bir deyişle, renk, malzeme, illüstrasyon/ resim, logo çok daha kısa bir süreçte algılanır iken, yazı elementine zaman ayırmak kullanıcıların seçimleri içeriğinde olabilmektedir.

Bu nedenle, katılımcılar yazı elementini okumak konusunda 3 gruba ayrıldı.

Birinci grup, ilk soruda - doğa kavramını bahis etmeden - yazıyı okuyanlar; ikinci grup, ikinci sorudan sonra – doğa kavramından bahis ettikten sonra- yazıyı okuyanlar ve üçüncü grup ise birinci ve ikinci sorudan sonra bile yazıyı okumayanlardan oluşmaktadır.

Bu kısmın analizinde, birinci grubun, sürdürülebilir ambalajı seçenler olarak (Ambalaj 1), daha çok yazıyı okudukları ortaya çıktı.

Bu araştırmanın sonucunda, yine de, renk, malzeme, yazı, illüstrasyon/ resim, logo vb. ambalaj tasarım elementlerinden hareket edildi ve elementler 4 başlık altında gruplaştırıldı.

Ambalaj 2 ve Ambalaj 3ün tercih nedenlerinden en önemlisi, bu ambalajların renkleri oldu. Pembe ve sarı renkler için daha “iştah açıcı” ve “göze çarpan” gibi sıfatlar söylendi.

Bu ambalajları seçen katılımcılar için, ambalajların doğa dostu olup olmadıkları ikinci planda durmaktadır.

Kullanıcılar kapsamında sürdürülebilirlik kavramına ilgi duyulduğu ve belli oranda kavramın bilinç varlığı olduğu sonuçlandırıldı.

Bu çalışmanın sonucu olarak, ambalaj tasarımcılarının ambalaj tasarım elementlerinden yola çıkarak, sürdürülebilir yöntemlerle bu elementleri tasarlayabilmeleri önerilmektedir.

Ambalaj tasarımcılarının, ambalajlar ve kullanıcılar arasında bağ kurucu bir kimlik olduklarını anımsayarak, toplum içerisinde, sürdürülebilir tüketim alışkanlığını sağlamakta önemli bir rolü sahiplendiklerinden söz edilebilir.

1. INTRODUCTION

“The world we have created is a product of our way of thinking. Nothing will change in the future without fundamentally new ways of thinking.”

Einstein

Mankind has always struggled to fulfill his needs through daily activities. However, these activities may be harmful for the environment where human beings live in. Peoples' lives are full of products that are not designed environmentally oriented. Moreover, the vast majority of resources are being overused every day. Indeed, these resources are limited so this is the reason why human beings need to learn how to consume products and how to match their life style in order not to jeopardize the future of environment.

In this process, packaging design plays a crucial role from sustainability point of view in terms of guiding consumers to sustainable consumption behavior by providing proper information on packages.

The notion of 'sustainability' focuses on the fact that it is related to product development process until the last stage of use.

This notion has a significant role in reducing negative impacts on environment by making peoples' awareness of use well-designed packages. For example, there are packages that claim to be designed in a way that convey the proper information to the user in terms of sustainable consumption but still the shortage of this guidance is seen in the product packages.

Today, packaging appears to be a hinder in the path of sustainability. Although packaging is useful in product protection, product containment and product transportation, it could be harmful as a source of waste. For instance, after consuming a product, its package brings out wastes after disposal in most cases, which should be discarded. Here, the food packaging is not an exception of the above

issue (GFN-Global Footprint Networks), indeed the food packaging has the most negative impact on the two stages of consumption and production, and here in this thesis the focus is on the first phase of consumption.

Recently, governments and other associations are also notified about the negative influences of exceeding packaging waste on environment. For reducing this impact, sustainable packaging legislations and regulations are developed (Langhorn, 2010). They try to provide some systems such as systems for gathering and dividing package wastes relating their materials and collecting them in a specific place in order to recycle.

In addition, in recent years examples of sustainable packages that have been designed according to sustainable package design guidelines are observable. However, in some countries, consumers do not have enough information that could guide them correctly to sustainable consumption of that product (World Bank database, Global Population Trends, 2008). Thus, this is the designer's mission to design packages including the right information; so, this could guide consumers in a better way in order to have sustainable consumption. Indeed, this happens when packaging design elements as material, color, text and image/illustration are correctly been selected in the process of design.

As consumer behavior has a significant role in leading companies through creating proper products, here the question is whether it is possible to guide consumers to sustainable consumption behavior by the aid of design. In other words, environmental-based designs can be applicable.

1.1 Problem Definition

It is not well known how packaging design could successfully guide the consumers towards sustainable consumption and why it is significant to be applied in the process of design. Although companies may know the significance of considering this issue in the process of product development, they are attached to benefit oriented aspects in order to have a better market of that product, also companies may not recognize the elements that should be applied in the first step of design process that could lead to sustainable consumption.

1.2 Aim and Scope of the Study

Raising the question in the field of packaging design in terms of sustainability, the current research aims to investigate how design can guide consumers to sustainable consumption behavior. In doing so, the present research explored consumers' attitudes toward food package samples that were gathered from an interview through the study. Participants' attitudes were examined in the basis of package design elements such as material, color, text and image/illustration. The sample group of the interview was students of Istanbul Technical University in Ayazağa Campus.

1.3 Research Questions

1. How food packaging design guide consumers to sustainable consumption? Which package design elements (color, material, text and illustration) in particular guide consumers to sustainable consumption? Should all the four elements be designed in sustainable way to realize the guide or applying it to some of the elements is effective?
2. Can consumers differentiate the sustainable packages from unsustainable ones? How? To them, which characteristics imply sustainability and/or unsustainability in concerning food package?

1.4 The structure of the thesis

Study begins with a concise introduction, presents the problem definition, aim and scope of the study, and sets the research questions. Chapter 2 consists of literature review findings. The literature review begins with describing the environmental issues regarding sustainability, and presents the definition of key concepts such as sustainable consumption, sustainable design and package design for sustainability. The literature review also includes a part explaining package design elements. Afterwards literature review continues with guidelines of sustainable packaging design. Focusing on food packaging, the importance and role of sustainable consumption through food packages is described. This chapter concludes with an internet-based research on sustainable food packages. Chapter 3 summarizes the methodology for the research with a focus on qualitative research methods. This

chapter contains the structure of the research conducted for the study including three phases. Phase 1 is a pilot study that was conducted on students. Phase 2 is observation in Finnair Airlines through food packages and following that an interview with supplier of that food packages- Finncatering Company (which was observed in Finnair Airlines). Phase 3 is interview with students through food package samples gathered from Finncatering Company to investigate their attitude to sustainable food packaging. Chapter 4 focuses on findings and presents content analysis as this study's analysis method. Chapter 5 presents and summarizes the conclusions. It also comes up with recommendations for further research.

2. LITERATURE REVIEW

Today most consumers are involved in a fast consumption behavior in society. This kind of life-style has various effects on their life directly or indirectly. People are overwhelmed with alarms about food contamination, climate change, chemical pollution, the potentially negative consequences of genetically modified products, and many other environmental and health-related risks (Boström& Klintman, 2008-Klintman, 2008). While consumer lifestyles and corresponding research is taken into consideration, food is seen as the most important ecological footprint because of great impacts at both production and consumption stages (Tukker et al., 2003). Therefore, literature research (Figure 2.1)was carried out according to keywords / contexts such as Sustainable Consumption, Sustainable Design, Package Design, Sustainable Packaging and its guidelines and Sustainable Consumption through food packaging.



Figure2.1: Literature Research Keywords- adopted from thesis presentation (See Appendix A.6)

2.1 Sustainable Consumption

In literature, observing diverse definitions of sustainable consumption is inevitable. In this study, the definition of the World Commission on Environment and Development (WCED, 1987) of sustainability is selected to be a core definition. It defines sustainability as "forms of progress that meet the needs of the present without compromising the ability of future generations to meet their needs."

United Nations Commission on Sustainable Development (UNCSD) has defined sustainable consumption first in Symposium on Sustainable Consumption-Oslo (1994). According to this definition, sustainable consumption is "the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations." The importance of consumption within sustainability debate is recognizable in comparison with the past. Emerging the term of "sustainable consumption" is a sign of the emphasis to this issue. Studies of consumer behavior demonstrate a boost in consumers' awareness concerning environmental issues. This increase has led to their willingness to act on these concerns. However due to a variety of barriers, consumers' willingness cannot be translated to a sustainable consumer behavior. These barriers are such as availability, affordability, convenience, product performance, conflicting priorities, skepticism and force of habit. Following the consumption history from emerging a consumer society towards a sustainable consumption pattern highlights consumer role significance. To make the point more deductive, according to McCracken (1990) the "great transformation" of the West, is not only an "industrial revolution" but also a "consumer revolution". Moreover, this revolution had the power to alter the main shift in the culture of the early modern and modern world.

In order to give a brief history, it should be mentioned that sustainable consumption is a novel terminology. However, its concept has been discussed over decades. The sustainable consumption challenge became visible as a key issue in 1992 at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro (Sands, 1994).

According to a report in the title of “Policies for Sustainable Consumption” two examples in below are specified that are related to the concept of sustainable consumption:

- The Club of Rome’s limit to Growth report drew attention in 1972 – the reason was about the impact of resource scarcity and environmental degradation.
- Rise of oil prices in 1973/4 and 1979/80 indicated that business-as-usual consumption levels needed a change. Afterwards there was a fall in the oil prices aftermath of the shocks and as a result, a fail in materializing predictions of resource scarcity happened.

Due to the importance of the sustainable consumption, the fourth chapter of Agenda 21 is specialized to the context of sustainable consumption. Agenda 21, “is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment.”(United Nation Division for Sustainable Development, 2007)

This policy document has emerged from the Rio Earth Summit in 1992. The importance of sustainable consumption pattern was remarkable that the forth chapter of Agenda 21 was entitled “Changing Consumption Patterns”. In this section, “new concepts of wealth and prosperity which allow higher standards of living through changed lifestyles and less dependent on the Earth’s finite resources” constitute the main points in the discussion. These points influence the outcome of the discussion, which was setting far-reaching mandate for questioning, examining and revising consumption patterns together with looking deep into consumer behaviors, choices, expectations and lifestyles.

The international policy community subjected this mandate to enthusiasm. In 1994, a roundtable on sustainable consumption in Oslo took place (hosted) by Norwegian government where business, non-governmental organizations (NGO) and government representatives were involved (Ofstad, 1994). Besides, the United Nations Commission on Sustainable Development (CSD) organized an international work program aiming changes in production and consumption patterns in 1995. By the late 1990s, sustainable consumption became a controversial debate in its highest

point. In 1998, Human Development Report explicitly declared the significance of sustainable consumption topic (UNDP, 1998).

According to Cohen (2005), in 1999 sustainable consumption notion progressed in the aim of changing the consumption pattern with formulating an Action Plan on sustainable consumption for the World Summit on Sustainable Development (WSSD). Furthermore, in 2001 United Nations Environment Program (UNEP) introduced a strategic document pointing out the opportunities provided by sustainable consumption focus (UNEP, 2001). In 2002, UNEP announced that a progress towards sustainable consumption implemented strategically and ‘changing consumption and production patterns’ was identified as one of three ‘overarching objectives’ for sustainable development (UNEP,2002).Nowadays, sustainable consumption pattern continues to be an emerging field. However, it becomes evident that sustainable consumption can be achieved only with the existence of sustainable products and services for consumption (Chapman. J, Gant.N, 2007)

As research show that, the highest levels of environmental impacts are related to food both in production and consumption level, thus this study will examine food-packaging designs to investigate their role in guiding and motivating consumers to sustainable consumption pattern.

2.2 Sustainable Design

The terminology of Sustainable Design, which is also called as green design, eco-design, design for environment (DFE), is widely used in various stages such as in business and academic fields. However, there is not a general accepted definition for this terminology. The origin and history of term of “ Sustainable Design” could be inspired and used after “Sustainable Development” terminology since 1980s (Carvalho, 2001). Brundtland Commission which was established by United Nations in order to rally countries to work and follow sustainable development together, later on has come up with a revised definition. According to Chapman and Gant (2007), there is a phrase by Elkington named as ‘triple bottom line’ (TBL) of sustainability. He defines this phrase as ‘simultaneous pursuit of economic prosperity, environmental quality and social equity’ (Chapman and Gant, 2007).UK Design Council (2001) provides the definition of sustainable design as “balancing social, ethical and environmental issues alongside economic factors within the product or

service development process. It ensures that the needs of both the business customer and society are met whilst protecting the ecosystem.” Desai (2007), Deputy Secretary-General for the 1992 Rio Summit also defines sustainable development as “a bridge concept connecting economics, ecology and ethics” and continues that, “The challenge is to connect and integrate various sectorial policies, such as agriculture, energy, trade or investment. To get real action, the ownership of the concept of sustainable development must extend to all sectorial agencies and– most importantly – to key private-sector stake holders.” The mentioned definitions above can be used as a guidance tool in passing through current consumption behavior to Sustainable consumption behavior.

Sustainability can only be achieved through better design (Datschefski, 2001).

Nowadays, governments, communities and industry are all seeking ways to prevent pollution and overconsumption from ruining the planet and the natural sources such as oceans and forests. Design is the key intervention point for making radical improvements in the environmental performance of products and persuading business to consider environmental aspects through design. Designers mostly focus on improving form and function, but fabrication- how products are made – is also vital. Fabrication is where many of the environmental and social impacts lie, with damage being caused by extraction of raw materials and by pollution rising from manufacturing processes (Datschefski, 2001). In other words, in the path through sustainable consumption embedding life-cycle thinking into the product development process is substantial (Fiksel, 2009). Therefore, manufacturing must also be functionally viable for it to sit in that triangle.

The concept of Design for Environment (DFE) points out to design aspect while correlating it with other significant issues such as life, systematic consideration of design performance with respect to environmental, health, safety, and sustainability objectives over the full product and process of lifecycle (Datschefski, 2001).

2.3Package Design

In this study, as one of main areas is ‘packaging’, this section provides a brief about packaging and its definition.

A package at its most fundamental level, contains, protects and - in some definitions transport (Paine, 1992) - promotes products (Stewart, 2007). A commercial activity

demands designers having a business sense. They should be aware of lifecycle of packaging from production, distribution and retailing, until the disposal of that package. Packaging design encompasses practical information on the critical issue of choosing packaging materials, deciding on what graphic techniques to employ and comparing merits of photography and illustration (Stewart, 2007). Packaging has also been described as a 'complex, dynamic, scientific, artistic and controversial segment of business' (Paine, 1992). The dynamism concept of packaging is deductive as it is subjected to "new materials therefore new methods, new methods demand new machinery, new machinery results in better quality, and better quality opens up new markets which require changes in packaging"(Paine, 1992).

Therefore, in a fundamental base, according to Paine (1992), "packaging contains, protects, preserves and informs". In its sophisticate stage, packaging provides two more functions, "selling and convenience". The decision- making should be considered in each stage of packaging design that has a financial implication on the package as a whole while decisions regarding environmental aspects also have to be implemented. Moreover, Paine extends the packaging design definition by providing the following statements:

- (1) A coordinated system of preparing goods for transport, distribution, storage, retailing and end-use
- (2) A means of ensuring safe delivery to the ultimate consumer in sound condition at minimum overall cost
- (3) A techno-economic functions aimed at minimizing costs of delivery while maximizing sales (and hence profits)

In future, it is predictable that today's world will encounter post-fuel crisis, which will lead in increase in material cost. High material cost would be the result of extra cost of energy. However, the essentials in packaging always are containment, protection and information. According to Paine (1992) these factors are:

- Containment: Obviously, the package must keep its contents secure between the end of the packaging line and the time when all the content was consumed.

- Protection and preservation: The packaging must protect the food from mechanical damage during handling and deterioration by the climate(s) through which the package will pass during distribution and storage in the home.
- Communication (Information): All packaging must communicate. Not only must the contents be identified and the legal requirements of labeling be met, but often the packaging is an important factor in promoting sales. In addition, the unit load and the shipping container must inform the carrier about its destination, provide instructions about the handling and storage of the content, inform the consumer about the method of opening the package and possibly even of the best way to display the product.
- Machinability: The majority of modern retail packages and many transport packages are today erected, filled, closed and collated on machinery operating at speeds of 1000 units or more per minute. They must therefore perform without too many stoppages or the process will be wasteful of material and uneconomic. Even when the numbers concerned are small and the items specialized, the need for a good performance in filling and closing operations is still important.
- Convenience and use: The most common impressions of convenience in retail packaging for products like food are those of providing easy opening, dispensing and/or after use. Every opening must be tempered by seal integrity. The trap of producing an opening device, which fails in transit, or of failing to provide sufficient control on the packaging line to ensure the device works 99% of the time, must be avoided.

In addition, developments in marketing also have effects on packaging. Starting with definition of marketing, that is, “the identification, anticipation and satisfaction of customer need profitably” (Paine, 1992), consumers’ lifestyles influence on packaging of food is clearly observable. Besides, not only packaging can be capable of promoting a marketing response to customer demands but also it can change consumers’ lifestyles such influences as green issues like organic farming, more acceptable methods of animal husbandry and the reuse and/or recycling of packaging before final disposal.

Packaging is a technical activity, which requires technical perception of materials and processes. The designers are also involved in making decisions in a constantly changing and complex series of issues (Stewart, 2007). Furthermore, designers are

being expected to gain a deep understanding of society, needs and desires of the consumers. Designers get the education of designing products and packages considering people inside a society, which provide a focus point to their designs. With the aid of knowing consumers' needs designers be able to communicate with them in correct path (Stewart, 2007).

Thus, designers are not only expected to be commercially alerted, technologically updated and socially aware, but also to be creative thinkers and expert communicators. Another key area is about branding and brand names, which has become more than a graphic device in order to demonstrate their quality. Going back again to designers role, they are expected to translate the brand values by the means of sensitive and creative design skills to consumer interface presented packaging.

2.3.1 Packaging design and its elements

According to Stewart (2007), key packaging design skill is to communicate design thinking effectively. He defines the elements of package design or packaging design toolbox as:

- Material Choices
- Color
- Text
- Photography and Illustration

Packaging design is both in two dimensional – graphics and typography and three dimensional -shape. Decisions regarding the shape of package cannot be considered separately from the material of the package. Material choices may be dependent upon various issues like type of substrate material, type sizes, run length and cost constraints. As one of potential options could be in-mould labeling, direct screen-printing, on-line labeling or shrink sleeving (Stewart, 2007)

2.3.1.1 Material

A range of principal mainstream material types are (Stewart, 2007):

- Paper and board
- Glass
- Metals
- Plastics

- Composites: Packaging often includes more than one material, e.g. laminates of aluminum foil, plastic and paper.

Paper:

Paper-based packaging advantage to other materials in relation to its environmental aspect because it is produced from sustainable and renewable resources. Natural materials like paper-based papers also are biodegradable and composting well with – out polluting the soil or watercourses and are suitable for recycling.

Glass:

Although rigidity is one of glass characteristics, it is actually a super cooled liquid. It is inerted to most materials and therefore able to contain a wide range of materials without contamination. Furthermore, in glass packages, it is suggested to not use colors other than brown or green since these cannot be recycled because of contamination exists in their pigments (Stewart, 2007)

Metal:

Mostly used in the form of cans for drinks and food products, steel and aluminum have an extensive field of usage. As 100% barrier properties with respect to the permeation of gases, liquids, solvents and UV light have helped metal material to become the most protective packaging since the 1880s (Stewart, 2007).

Plastics:

According to Stewart (2007), among all the materials available to packaging designers, plastics have the most variety not also in terms of type but also in processing methods. The choice of container material, in many packaging studies, may be made based on rigidity as in the case of a bottle of mayonnaise or flexibility as demonstrated by a pouch or sachet of the same mayonnaise. Packages like bottles and jars are named as rigid plastic containers.

Types and codes of rigid plastic:

According to the American Society of Plastics Industry (SPI), the codes in Figure 2.2 are created to represent the type of resin used in plastics.

Terminology and symbol

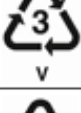
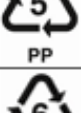
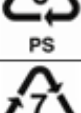
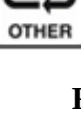
Recycling code	Abbreviation & name	Use
 PETE	Polyethylene terephthalate PETE or PET	Recycled to produce polyester fibres, thermoformed sheet, strapping, soft drink bottles.
 HDPE	High density polyethylene HDPE	Recycled to become various bottles, grocery bags, recycling bins, agricultural pipe, base cups, car stops, playground equipment, etc.
 V	Polyvinyl chloride PVC or V	Recycled to become pipe, fencing, and non-food bottles.
 LDPE	Low density polyethylene LDPE	Recycled to become plastic bags, various containers, dispensing bottles, wash bottles, tubing, etc.
 PP	Polypropylene PP	Re-usable, microwaveable, dishwasher safe, and recyclable.
 PS	Polystyrene PS	Recycled into a wide range of products including office accessories, insulation board and polystyrene products.
 OTHER	Other plastics, including acrylic, polycarbonate, polylactic acid, nylon and fiberglass.	Car parts, appliance parts, computers, electronics, water cooler bottles, packaging

Figure 2.2 : Types and codes of rigid plastics

(American Society of Plastics Industry (SPI), 1988)

The presence of the symbol implies that the plastic item is recyclable, but it is actually intended to identify the plastic resin from which the item was made.

(American Society of Plastics Industry, 1988)

2.3.1.2 Color

At initial steps of package design, designers usually work in pencil, ink or other single color media. The advantage of this is to design work is to develop the designing process without any variables regarding color choice (Stewart, 2007)

The color choice decisions are implemented according to the case below (Stewart, 2007):

- Decisions may be imposed, such as the use of corporate colors

- Decisions are not imposed; designers have a great degree of freedom. In order to use the freedom effectively, it is significant to understand that colors are “read” much faster than text, communicating immediate information to the viewer.
- (specific colors) identify a brand
- tell viewer something about the nature of product – make a connotation in viewer mind
- contain cultural associations or evoke some innate emotional reaction

However connotation to cultural or emotional messages may be controversial in some cases therefore designer role, gain its significance in the sense of balancing the frequent opposing design parameters. A section of colors and regarding semiotic associations together with cultural and emotional meanings is described in the Figure 2.3.

	emotional	cultural	product categories
	passion heat love energy	revolution communism stop/danger	beef chilli
	joy creativity	sectarian associations in Ireland danger	orange flavour
	happiness	warning cowardice in USA and UK nobility in Japan	chicken banana flavour
	freshness natural fertility	Islamic colour go/on sectarian associations in Ireland	vegetable/organic lime menthol spearmint
	cool calm male trustworthy	mourning in Iran immortality in China	fish low calorie peppermint
	luxury wealth fantasy romance	death in Latin America	luxury products

Figure 2.3 : Color Chart (Stewart, 2007)

“In packaging, colors are often used to denote product categories, cultural meanings and emotional associations. Of all the tools in design toolbox, color perhaps is the easiest to get wrong” (Stewart, 2007)

From business aspect, color also plays an important role as some brands have embraced color used in the package- product. In other words, this has become a property of some brands. To illustrate, red is reminder of the brand- Coca –Cola as it is shown in Figure 2.4.



Figure 2.4: Coca-Cola and the package color(Url-1)

2.3.1.3 Text

Another important section is related to typography that gives strength in meaning and understanding to viewers. In order to choose a typeface, designer should consider the nature of the product and it appeals to the market that can easily communicate with viewer .There are some criteria (Stewart, 2007) defining which typeface to use on a packaging design:

- Sympathy with product
- Type size required
- Substrate: being printed
- Print process
- Design features: tints, reversing out
- Measure: line length (usually small on packaging)

2.3.1.4 Image/Illustration:

An essential element that is required in most of packaging designs is including images or illustrations as an integral part to design. Packages in supermarket environment should have the ability to communicate information quickly with no need to read the package in detail. Most of the time, images transfer a wide set of messages and information more effectively than texts. That is the reason why experts in this field call packaging as “mini-advert”. However, advertisements provide time for the eye to follow the images and motion, but in packaging, the time is much

shorter for scan and understands. This is the reason that package designers are eligible to use in printed adverts rather than on-pack design elements. The designer's aims are to drawing the purchasers' attention by the image and then guide them to information.

1. *Image*

In designing packaging projects, visual messages and information can be obtained by (Stewart, 2007):

- Sketches and illustrations: Making scenarios related to the product / package and its function
- Using an existed illustration or photograph: (i.e. from related product magazine) while it may not be the exactly right image but conveying the design idea
- Illustrations and images available at on line Image stocks: sometimes usage of the images of this part should be done after purchasing and by right

As one of common areas of packaging design, Food Photography requires specialist skills and cookery guidance. However as in some food packaging, the food itself and its photograph on the package are quite far from each other, in this situations illustrations are preferable to designers.

2. *Illustration*

In order to make initial concepts, designers may choose to create their own illustrations. However, the illustration should be clear about what designer desires to achieve and in same direction of client requirements and brand values. For example, a cartoon style of illustration may attract attentions, however questioning the chosen image and appropriateness of that is substantial.

Thus, sometimes it is needed to refresh clients' minds by a hand-produced illustration, a watercolor or bold pen and ink drawing, which reminds the client of the design skill they are purchasing. Collecting such illustrations are activities that clients are familiar with and eager about.

Looking once more from image point of view, Figure 2.5 the effective usage of the image of the farmer gives an immediate freshness to the pack; this could be in relation with the posture of farmer that he is working. Besides, usage of brimmed hat in the picture, connotes a local food and as a result a special ethnicity.

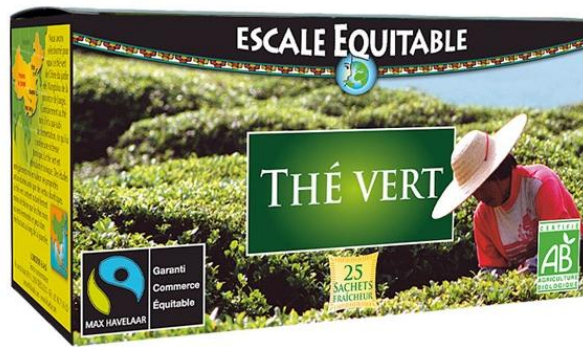


Figure 2.5: Green Tea package by Escale Equitable (Url-2)

2.4 Sustainable Packaging:

In this section, a definition produced by Sustainable Packaging Coalition (SPC) – a membership based organization in the United States covering many companies – is provided through the importance in sustainable design and sustainable consumption.

According to SPC (Yam, 2009), Sustainable Packaging:

- A. Is beneficial, safe & healthy for individuals and communities throughout its life cycle.
- B. Meets market criteria for performance and cost.
- C. Is sourced, manufactured, transported, and recycled using renewable energy
- D. Optimizes the use of renewable or recycled source materials
- E. Is manufactured using clean production technologies and best practices
- F. Is made from materials healthy throughout the life cycle
- G. Is physically designed to optimize materials and energy
- H. Is effectively recovered and utilized in biological and/or industrial closed loop cycles.

World Packaging Organization (WPO,nd) mentions that four aspects of “reduce, reuse, recycle, recover” are the basis for an operative, powerful model that will grow significantly over the next few years.

2.4.1 Guidelines of Sustainable Packaging design

In literature, it is possible to find various guidelines of manufactures or associations through design sustainable packages. These guidelines mostly vary in priorities of the items. In this study, the focal point is on guiding aspect of the package to sustainable consumption behavior pattern.

According to Sustainable Packaging Coalition (SPC), strategies for sustainable packaging design are:

- Design sustainability
- Design for transport
- Design for environmental best practices
- Design for fair labor and trade practices
- Design for renewable virgin materials
- Design for reuse
- Design for recycling
- Design for composting

Another example in sustainable package design guideline is from Design Council in UK, which signifies design role through making packaging sustainable.

According to Design Council (2010), improvement of the environmental impact of the packaging can be attained by designers’ attention to:

- Design packs made from sustainable materials. For instance, using cardboard from Forest Stewardship Council (FSC) - an independent, non-governmental,

not-for-profit organization established to promote the responsible management of the world's forests- forests instead of unknown sources.

- Redesign the package without material combinations, enabling packaging to be easily recycled. For instance, bottle lids and their body to be made from the same plastic.

Wal-Mart, as one of the world's biggest retailers, fully adopted the EU Directive on Packaging and Packaging Waste. According to Jedlička (2009), European Parliament has published a directive on packaging and packaging waste that is named European Parliament and Council Directive 94/62/EC- 1994. He states, "This directive provides for measures aimed at limiting the production of packaging waste and promoting recycling, re-use and other forms of waste recovery. Their final disposal should be considered as a last resort solution". Moreover, "... this directive covers all packaging placed on the European market and all packaging waste, whether it is used or released at industrial, commercial, office, shop, service, household or any other level, regardless of the material used." It should be mentioned that EU directive has been amended in following years after its first publication (1994): 2003, 2004, 2005 and 2009.

Wal-Mart over past several years has explored the importance of the concept of sustainability. Packaging is an area where costs can be decreased together with minimizing toxics and impact on environment. "Wal-Mart Scorecard system for packaging, asks suppliers to enter product information to determine their impacts. In order to help Wal-Mart achieve its sustainability goals, suppliers are to consider seven Rs for packaging." (Jedicka, 2009, p.204)

These 7 R's are:

1. Remove Packaging (elimination of unnecessary packaging, extra boxes, or layers) Reduce Packaging (utilization of "right size" packages and optimizing material strength)
2. Reuse Packaging (Pallets and reusable plastic container)
3. Renewable Packaging (use materials made of renewable resources, select biodegradable or compostable materials)

4. Recyclable Packaging (use materials made of highest recycled content without compromising quality)
5. Revenue (Achieve all above principles at cost parity or cost savings)
6. Read (get educated on sustainability and how we can all support it)

The 7th R, read, is particularly the core concept of this research that is aimed to be tested in this research among consumers in order to investigate that whether they understand and prefer such sustainable packages or not. According to Wal-Mart, seven “R’s” should be followed in order to design sustainable packages:

The three definitions provided above, demonstrate that associations are not far in this knowledge from each other however as mention before their definitions vary in priorities. Education factor plays an important role in developing the consumption behavior and makes the transition possible to sustainable consumption behavior with the aid of creating and designing communicative package design elements (material, color, text, image / illustration).

In addition, the capability of a package to communicate with consumers plays a significant role that studying the concept of communication design is necessary. In following section, the ways to design proper communication that can be used as a reference to guide consumers through sustainable consumption, is studied.

2.4.2 Sustainable consumption through Food Packaging

This section encompasses reviews on history of food packaging in order to investigate the background of this field. Furthermore, it covers the reasons of food packaging significance in sustainable consumption behavior pattern.

Study on the above issue shows that man has struggled to protect the food he produces. This protection is mainly implemented from animals (rodents) and microorganisms (bacteria) which cause wastage in different stages of growth, harvesting, processing, storage, transport and sale of food (Paine, 1992).

As these microorganisms (bacteria) grow inside food, it alienates from healthiness and becomes poisonous. The important duty of food industry is not only “ provision of food which is good and safe to eat but also prevention of waste which is essential

to food industry and to a nation's economic well-being "(Paine,1992). Therefore, packaging significant role in achievement of safety objectives and waste prevention is dispensable. In history of food packaging, it is estimated that first packaging were probably from leaves that early man used to wrap meat from hunt. This and many other examples of the early uses mentioned in literature (Paine et al, 1992) were concerned with survival. Moreover, they illustrate basic principles of food packaging. According to Paine (1992), these principles are as follows:

1. "Food must be available wherever there are people", although in modern population patterns production and consumption places can differ
2. "Food, in interesting variety must be available all the year around, irrespective of the growing season"
3. Food presentation "must be in a way that is convenient to purchase and use", which in most of literature this means that, "it must be packaged".

A suitable packaging should consider subjective decisions such as right shape and size of the pack together with attracting graphics to purchaser eye. In some sense, development and design of innovative packaging have brought a wide range of product choice to offer the consumer with "complete confidence in its wholesomeness, whether it's seasonable or not." The increase of public interest in heavy involvement in packaging is in balance with the hygiene and wholesomeness of food. As a vital objective for everyone, "prevention of food waste" also is applicable at all stages between the grower and the home (Paine, 1992).

2.5 The role of food packaging in Sustainable Consumption

There are some reasons for choosing food sector to work on in this research. Lefin (2009) goes through the importance of food sector by taking "Sustainable Consumption" definition at Oslo symposium (1994) as reference and mentions, "Consumption, in general, is crucial for sustainable development. Since food belongs to the very basic needs of all living beings, since it is, worldwide, the most essential product for daily consumption, one can even say that food consumption, in particular, is capital for sustainable development".

She also continues with reporting that, “In an analysis of the environmental impact of products (EIOPRO), Tukker et al. (2005) underlined that within the EU-25, approximately one third of the total environmental impacts (amongst which energy use, land use, water and soil pollution, emission of greenhouse gases,...) from households could be related to food and drink consumption. They have also revealed that, the environmental impact of consumed foods exceeded the impacts of all other investigated consumption domains, even transport (17% of measured impacts) and housing (7% of measured impacts).”

Furthermore, together with external environmental aspects, food is an “internal” issue, which is closely connected to human health. (Tischner and Kjaernes, 2007). According to Schäfer et al (2007), current food consumption patterns cannot be called “sustainable”, thus “a transformation to sustainable food consumption would be essential for sustainable development”. In order to realize this transformation, an option can be sustainable living or sustainable life-style. Sustainable life-style can be defined as a kind of living that uses products more sustainably in order to reduce environmental impacts. Due to broadness of sustainable living context, here the scope of study is on food products. In order to find out the food products’ place in sustainable living context, an internet-based research has been done with the key words of food sustainability and sustainable food packages. Through this research, ten food products were found that supported sustainable life-style with their content and their package. Through internet-based research, general food features of mentioned keywords (food sustainability and sustainable food packages) were found. Thus, for a food to be sustainable, food should be featured by being:

- local
- organic
- fair-trade
- natural

While consumers see the features above on food packages, they can be informed about the place the food has been made; the people who have made them and the sources that food have been made. After identifying the features, the ten packages

were been analyzed through packaging design guideline elements: material, color, text and illustration/image.

2.6 An Internet-based Research on Sustainable Food Packages:

1. Organic Farm Milk

The packaging design (Figure 2.6) is inspired by a small, local, organic farm in rural Maine. According to Perkins, “The idea behind the design is to do sustainable, organic, label free packaging”.



Figure 2.6 Organic Farm Milk: designed by Lindsay Perkins, a senior at the Savannah College of Art and Design. (Url-3)

The package **material** that consists of glass (bottle) and plastic (cap) provides this aim. Moreover, in **color** palette, black and brown colors are chosen as consistent part of different content types. Different colors are used in order to separate the type of the content i.e. percentage of fat in milk. This color differentiation can guide consumers to choose easier and faster. The **text** used in the packaging is hand rendered in the shape of grass. The milk jugs are label-free and all information is printed directly on glass. This information includes instruction consumers to return the glass jugs, refill and reuse them. Another element is the **illustration** designed on

the package. The form of grass is a close reminder of nature and sustainability. Besides, the illustration of grass is designed by text, which describes the environmental missions of the company.

2. Organic Farm Cheese

This package (Figure 2.7) is also inspired by a small, local, organic farm in rural Maine. This is another product category of Organic Farm.



Figure 2.7:Organic Farm cheese: designed by Lindsay Perkins, a senior at the Savannah College of Art and Design. (Url-4)

According to Perkins, the package **material** is biodegradable cheesecloth and biodegradable wax paper. The craft paper material can easily connote the natural and environmental-friendly look. Perkins continues that, “The paper used for the bag is 100% recycled and biodegradable, made with grass seeds. So however it is disposed of, wherever it ends up, grass will grow, a way to give back to the farm's free-range animals.” The **color** palette is based on two colors of white and black on brown paper. It can be said that brown color has a direct perception of being organic, thus in this product usage of black and white embedded in brown background (paper) can be a proper reference to sustainable consumption pattern. The **text** on the package, gives the handmade product feeling. Handwriting connotation causes a close communication between the package and the consumer. The text indirectly transforms to **illustration** of grass that can be a guidance tool to remind consumers the neutrality.

3. Natural chocolates by UTEN

According to Uten Company, contents (Figure 2.8) are “homemade and free from gluten, milk, soy, refined sugar and preservatives”.



Figure 2.8: Natural chocolate designed by Marcin Rusak package designs for a Norwegian company UTAN (Url-5)

The **material** of the package consists of cardboard, a plastic container and a sting that Rusak founds it encouraging and mentions that, “The packaging encourages the buyer to re-use, with recipes and tips inside the label folder. When ... the chocolate is eaten, simply take of the tags (the string makes sure you’ll have no sticky glue marks!) and use the empty containers to create your own delicious foods.” In **color** palette of the package, black is chosen for the font color. As researches show that brown paper has a direct perception of being organic, thus in this product usage of black embedded in brown background (paper) can be a proper reference to sustainable consumption pattern. The **text** of the package is simple. It creates an understandable piece of information without overwhelming the chosen area. The

illustration is provided inside the label after opening it in order to inform and guide consumers through one of sustainable consumption pattern ways, which is reusing it.

4. Fair trade Chocolate by Camino

Camino's new brand packaging system for its line of premium organic and fair trade products gradually is expanding outside the realm of cocoa and sugar products. Karacters Design Group develops the brand idea "a joyful food revolution". This also captures Camino's belief that "through the joy of eating great tasting food made from quality ingredients, people will be encouraged to think differently about their food – where it came from, who made it and what's in it." Nowadays people around the world are demanding for better food thus Camino aims to enter the mainstream with organic and fair trade products in order to appeal the wider demographic. "Not only has demand increased for organic and fair trade products, but competition has increased dramatically as well," says Henk van der Molen, chief operating officer, Camino. "Facing stiff competition from brands owned by large conglomerates, we needed to differentiate ourselves and turned to Karacters to help us express our story."

Camino comes from the Spanish word path or road. Using this as an inspiration, the custom-drawn map used on the bright packaging is filled with quirkily named streets of joy; the illustrations reflect the happy, vibrant and sustainable communities that Camino contributes to through its organic, fair trade, and co-operative partnerships and practices. The creative platform developed by Karacters allows for consistent application across a variety of packaging formats, helping Camino to build strong brand recognition and shelf presence as it expands its product lines to chocolate snack bars, sugars, various baking products and more. Through a growing range of premium organic, a fair trade food, Camino is doing its part to bring social change to the world. For their partners, cooperatives of family farmers in Southern countries, they contribute to bringing greater health and prosperity. For their customers, they bring everyday moments of joy they can feel good about (Henk van der Molen, 2010).

Camino's new visual identity (Figure 2.9) will be extended to all customer touch points, including a refreshed logo, signage, stationary and website, all timed to coincide with the launch of the new packaging.



Figure 2.9: Fair Trade Chocolate by Camino. designed by DDB Canada's Karacters Design Group, Canada.(Url-6)

The **material** of this package is paper and an inner foil. Due to the concept of product that mentioned above, **color** palette reflects having joy and fun during consuming the content. Applying bright colors emphasizes the brand mission that is enjoying the process of consuming the content. In upper part of the package, there is the brand logo and a **text**, which mentions the organic side of the content. Apart from these, in mid-section of the package, a separated section can be found in a bolder color tone and approximately different type font. This enables purchaser to observe it easier and stands out the needed product. Designers consider the brand name while designing the package, that is, Camino. Camino means Path or road in Spanish. Since the product is organic, designers desire to impress this aspect through illustration on the package. This **illustration** shows paths, which “quirkily named streets of joy”.

5. Organic Food by Doves Farm

Doves Farm is founded in 1978 and is one of the pioneers of organic farming. Doves Farm goal was to update their branding and packaging to re-establish their credentials within this now fashionable market. (Figure 2.10)



Figure 2.10: Food by Doves Farm: designed by Davies Hall (Url-6)

The **material** of the package consists of paper and plastic flexible bars. The **color** palette consists of light tones of mostly green and brown colors. This gives organic feeling to consumers. Differentiation in colors is related to the type of the product content such as flour tastes. The **text** is related to the content is chosen in bold font and contrasting color. The **illustration** reminds the homemade food. It also can be said that there is a storyline on the package regarding describing the content and the tools, which connotes the neutrality of the content.

6- Organic milk by Local Calves

This product (Figure 2.11) is a result of a collaborative work between the health dairy organization Skanemejerier and farmers in Finnveden and Kronoberg, Smaland (in southern Sweden). The aim of this collaboration is to offer residents in Smaland locally produced milk.



Figure 2.11: Organic milk by Local Calves: designed by Amore, Sweden.(Url-8)

The **material** of the package consists of laminated film and tetra-pak. The **color** differentiation has been provided according to the milk types that is: Blue for Lättmjölk – Skimmed milk and Green for Mellanmjölk-Semi fat milk, Red for mjölk – Natural milk. An area is set to **text** section of package that is a specialized place provided for information. Firstly, utilization of direct **images** describes the inner content fast. Usage of images instead of illustration in products such as milk makes a connotation that the content is organic. Moreover, it looks like that the cows are greeting the buyers with inviting them to consume organic milk.

7- Natural Juices by Froosh

Tasked with creating a new identity that clearly fights smoothie-confusion in the Nordic market and powerfully communicates the pure fruit health benefits of Froosh (Figure 2.12), Pearlfisher has delivered a single-minded identity that puts key brand messages at the forefront of the design. Pearlfisher has created a unique logo, cleverly linking the double 'o' to symbolize a simple fruit emblem. The bottle

graphics create immediate on-shelf differentiation, with strong statements that speak directly to the consumer. The color palette is simple fresh and contrasting, emphasizing the 100% real fruit recipe and increasing taste cues. (Natalie Chung, Creative Director Pearlfisher)

"Froosh is one of those challenger brands that we enjoy working with, the guys were passionate about design and it was great to work on something where copy was so integral to the overall design. It's a great brand with a new design that should help set it up for the future". Froosh will be available within the Nordic region countries and Germany. It sells within multiples, cafes, bars and vending machines.



Figure 2.12: Juices by Froosh: designed by Pearlfisher (Url-9)

The **material** of Froosh consists of glass, a paper label and a metal lid. The **color** palette is smooth and pale reflecting that the product is smoothie. This contrast enable purchaser to follow the information on the package easily. The **text** consists of simple type. In this package, the information is given through texts. Choosing different color for texts and their backgrounds provides a clear image to purchaser to communicate. **Illustration** has been used in logo by joining two “O” letters in logo “Froosh”, which is a direct reference to the content.

8- Natural Pasta Sauces & Pestos by Zest

“The packaging range features naive 1950's style illustrations of male and female naturist characters each proclaiming the 'free from artificial anything' message, whilst preserving their modesty with a key ingredient.” Each product within the range has a unique character holding a 'Free from artificial anything' sign with an arrow containing the words 'See behind for details' prompting the consumer to refer to the back of the jar. The characters are found again on the back of the jar (Figure 2.13), this time displaying the complete list of ingredients, proof that there is nothing to hide.



Figure 2.13: Pasta sauces & pestos designed by Designed by Designers
Anonymous, United Kingdom (Url-10)

The **material** of the package is made of glass, a metal cap and paper label. The main **color** palette reference to colors related to environment like soil, leaves and colors of trees. This creates a close connection to the mission of brand, that is 'Free from artificial anything'. The **text** is chosen to be not serious thus, it provides a powerful influence on buyers. Moreover, using different fonts and font colors enable consumer to easily pass through the information and perceive the provided message regarding the product advantages to other products. The eye-catching **illustrations** play important role in translating the existed information to the consumer eye. For

example, by an arrow in the illustration designer persuades the consumer to refer to other side of the package.

9- Organic Food by Märsödal Farm

This packaging (Figure 2.14) is been specialized for creating identity and packaging concept for ecological farm products. According to designers, “Together with the ecological look, we combined the classic French cloth pattern, with classic use of typography. It resulted with this one-of-a-kind branded experience.”



Figure 2.14: Food by Märsödal Farm designed by Chevy chase Design Studio, Sweden. (Url-11)

The **material** of the package is paper. A fabric pattern has been created with existence of the green **color**. This idea also is in harmony with creating a close connection between consumer and farm. The minimal design gives the package a minimal look. The **text** used is simple and handwriting section connotes the idea of a real farm shopping behavior. There is not an **illustration** but the pattern used gives the idea of farm products easily and properly.

10 –Organic Fruit Yogurt by Biogurt

This package (Figure 2.15) is made of plastic (body) and aluminum (cap). It is also label-free and label is printed on the package



Figure 2.15: Fruit yogurt designed by Biogurt.

(Url-12)

. Apart from white **color** of body, the color palette consists of simple and minimal colors of green tones that refer to the bio side of the content as the logo mentions that. The package design is been done in a way that logo has been divided to two as BIO is written in one side and GURT in the following side. This **text** design provides the consumer to turn the package and follow the information easily. Therefore, logo description is designed in a humorous way. In addition, instead of using a dot or circle for 'i' in the word Bio, a 'leaf' is been used that is in a direct harmony with the concept of Biogurt. The **illustrations** of the package contain green leaves and the avocados. The green leaves' illustration is in close connection of Bio side of the content and avocados' describe the content.

3. METHODOLOGY

This chapter presents the methodology and the data analyses that were carried out in order to explore the role of design food packaging regarding guiding consumers to sustainable consumption and how they cope with the context of sustainability. This study focuses on the way packaging design elements can inform consumers about sustainability and sustainable consumption. This study was developed gradually according to the data gathered from five phases. Figure 3.1 and Figure 3.2 demonstrates the schematic of the methodology and structure of methodology according to each phase priority in sequence.

Phase 1: A pilot study was carried out with 45 students of Istanbul Technical University to investigate three points. First, the food type students consume, secondly students attitude to the chosen food type's package design and thirdly their attitude to the food type's package and its environmental issues. Due to being an exchange program student in Finland and being far from Turkey, for the pilot study an online questionnaire was conducted. Then the results were analyzed and the key points of study were extracted meanwhile, a trip was taken from Helsinki to Paris via Finnair Airlines. During the flight, the presented meal was totally in harmony with the results of pilot study in the sense of food type, food package design and its environmental issues.

Phase 2: This phase was dedicated to the observation of the meal, which was presented during the flight. Photographing passengers while having their meals, reading the package instruction and showing them to each other constituted the observation of phase 2. For further research on these packages, the contact information of the flight's meal producer company, Finncatering, was noted. After coming back to Helsinki, some e-mails were sent to the company (See Appendix A.2) and an interview was arranged.

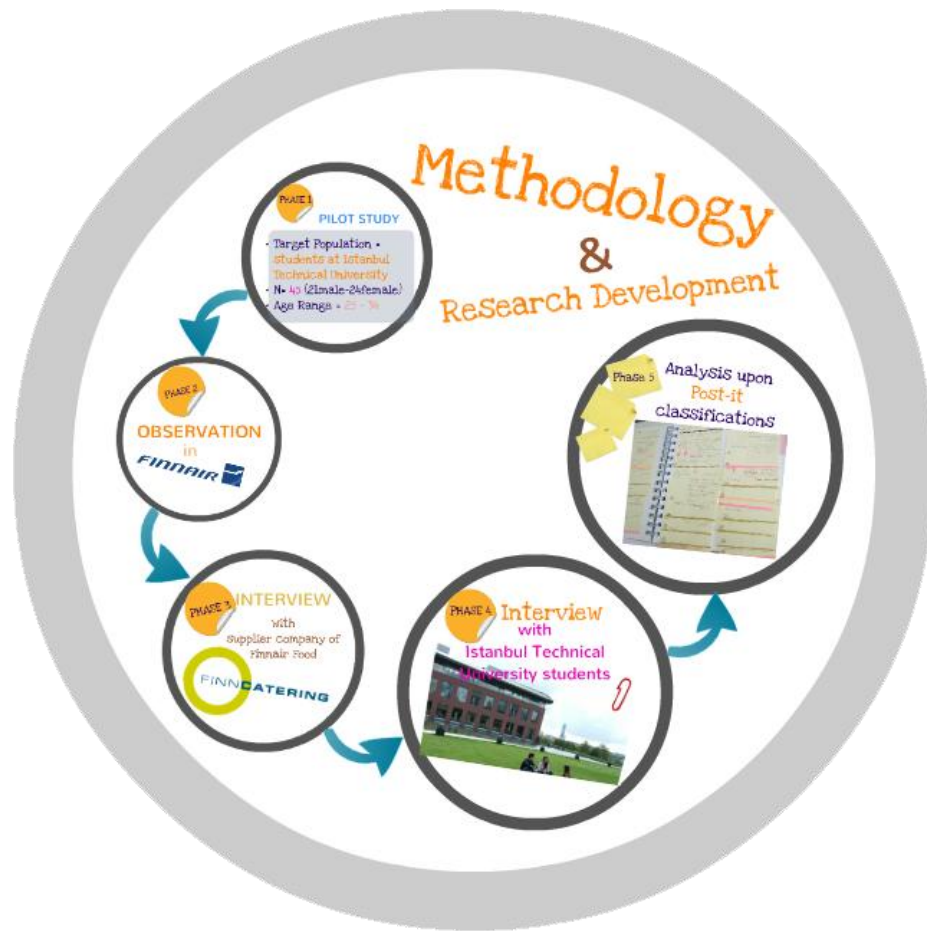


Figure 3.1: Schematic of the Methodology.

Phase 3: This phase contains the interview with Harjula, Product Development Manager in Finncatering Company (See Appendix A.3). In this phase, Harjula explained the reason that Finncatering Company designed the packages for Finnair Airlines and other sample packages that they have collected from other countries. Firstly, the interview and then sample packages were analyzed. The packages were different in the sense of packaging design elements (material, color, text and illustration/image). As the aim of this study is to explore the role of these elements in guiding consumers to sustainability and sustainable consumption, consumers' feedbacks to such elements carry great significance. Therefore, three different packages among the packages presented by Finncatering Company were selected. The packages were different in the sense of being/looking sustainable; being/not looking sustainable and not being/not looking sustainable was selected. As the fourth probability of not being/looking sustainable was not existed among sample packages from Finncatering, therefore it was not taken into consideration. After the selection of three packages, it was time to get feedback from sample group.

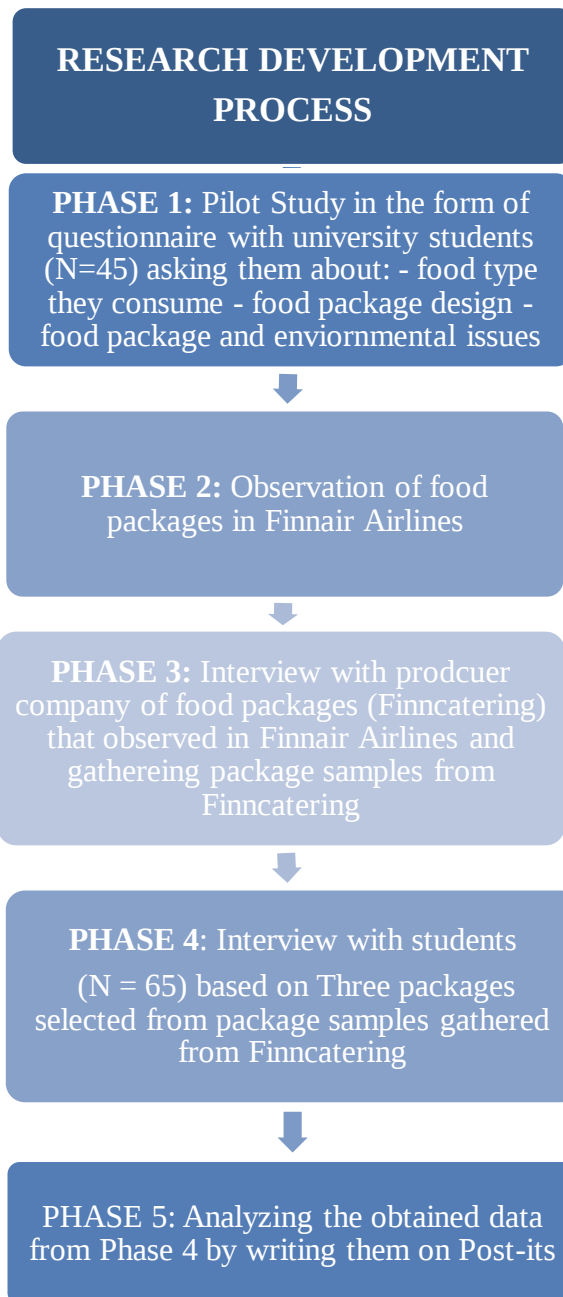


Figure 3.2: Structure of Methodology according to each Phase priority.

Phase 4: This phase was assigned to a survey, which was designed in the form of a semi-structured interview with 65 students from Istanbul Technical University. The survey was conducted in Istanbul Technical University –Ayazağa campus. In order to make the packages look like real sandwich packages, fake sandwiches were made and placed into the packages. Then, they were placed in a tray and the survey was started. As it was mentioned above, 65 students took place in the survey and their attitudes regarding their package selection in first level and then packages’

relationship with environmental issues were asked. Although, it is hard to code open-ended questions' results, the qualitative analysis was held in more than one way and the aim was to shed an additional light on the packaging design elements, which motivated consumers to sustainable consumption and maybe recognize a design approach to sustainability context.

Phase 5: This phase was assigned to analyze the obtained data from Phase 4 by writing them on Post-its (See Appendix A.5). The data on post-its include participants' personal information such as age, gender, major and their degree (bachelor's, master's and doctorate's). Afterwards, their responses to two open-ended questions regarding package selection they have made and the reasons of their selection are mentioned. In order to specify the selection more quickly in data analysis, the bottom section of the post-it was colored in similar color of each selected package. This analysis on the post-its was helpful in identifying the common and distinct points in package selections. The present study aims at identifying the role of design on guiding consumers to sustainable consumption through food packages. For the purpose of this study, it is significant to see participants' own attitudes on sustainability side of food packages. For this purpose, the research focuses on consumers' insights on environmental aspects of the package.

More specifically, the study aims to investigate answers to the following questions:

1. How food packaging design guide consumers to sustainable consumption? Which package design elements (color, material, text and illustration) in particular guide consumers to sustainable consumption? Should all the four elements be designed in sustainable way to realize the guide or applying it to some of the elements is effective?
2. Can consumers differentiate the sustainable packages from unsustainable ones? How? To them, which characteristics imply sustainability and/or unsustainability in concerning food package?

4. FINDINGS

4.1 Phase One: Pilot Study and its analysis

The first phase, a pilot study was designed and distributed in online format due to being an exchange student in Finland at the time. The questionnaire was prepared to investigate consumers' attitude on the food types they consume, the package design of that food type and the connection between the package and environmental issues.

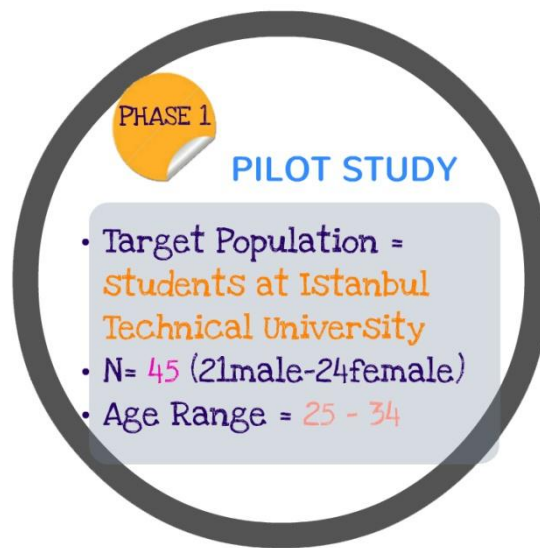


Figure 4.1: Schematic of Pilot Study.

Figure 4.1 shows the schematic of the participants' personal information of phase 1. 45 participants aged between 25-34 years old, nearly half female (54%) and male (46%) filled out the questionnaire. The sample group in this study was chosen as university students who study in Istanbul Technical University from different departments. The reason for selecting university students was the estimation of higher consciousness level in them in the context of sustainability and sustainable consumption. The Pilot Study's questionnaire (See Appendix A.1) was designed in three main parts (Figure 4.2):

1. Food Type
2. Food package design

3. Food package and Environmental issues

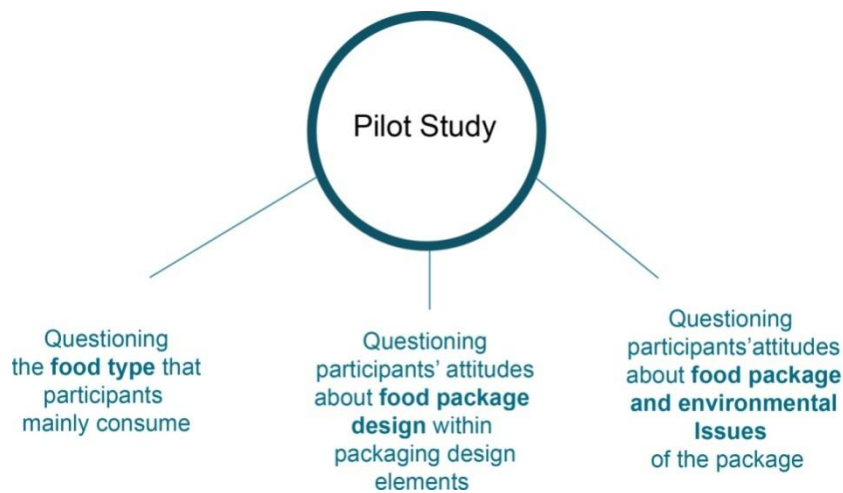


Figure 4.2: Three main questions of Pilot Study

Following sections contain descriptions of each parts of Pilot Study.

1. Food Type:

Packages normally contain information about their content. Therefore, consumers can understand or make guesses about the content with the aid of information on packages. Considering sustainability context, while information about sustainability is given on a food type, after a while consumers reconcile the food type with its package and the information on it. The result of this part determines the most consuming food type that participants consume. Therefore, the information and guidance to sustainability can be placed on the food type package that this part comes up with. Later on, the other questions of this section are related to the frequency of their purchase and the key points of their selection that they pay attention during decision-making. The questions of 'food type' section begin with:

- a) the main food type participants mostly consume
- b) the characteristics of their main food type which they pay attention while purchasing (a ranking question between brand, price, package design, expire date and other choices)

- c) the approximate amount of time which they spend in order to make decisions to buy their main food type

In part (a), respondents were asked to choose the food type they mainly consume (Figure 4.3);

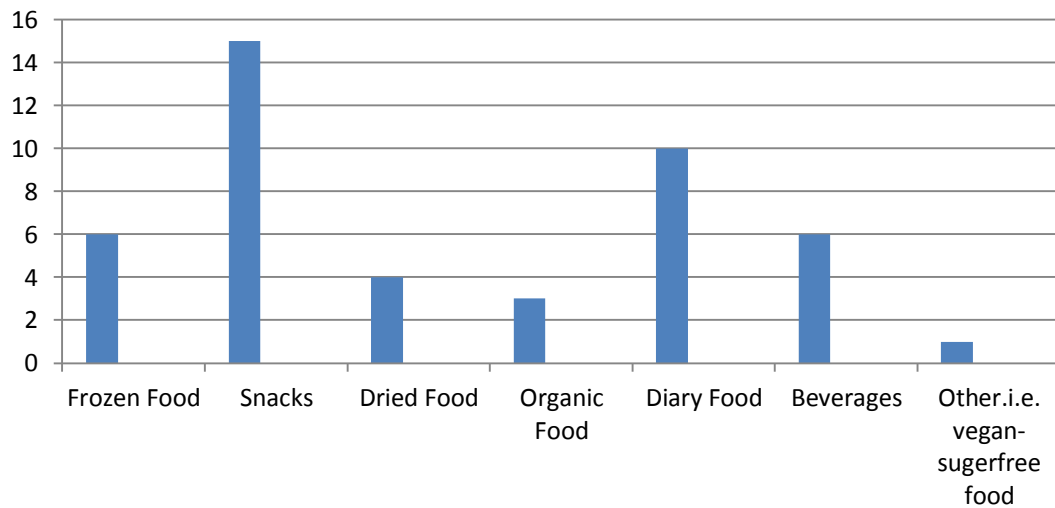


Figure 4.3: Food Type

Figure 4.3 demonstrates that the majority of respondents have chosen snacks as their main food type. In part (b) of food type section of questionnaire, respondents were asked to identify the characteristics they pay attention on their main food type (Figure 4.4). These characteristics contain brand, price, package design, expire date and other such as food ingredients. Figure 4.4 shows that, 12 of respondents found the brand factor as an important characteristic, 16 of them think that price of the desired food type plays an important role, to 4 of them the design of package is more significant, 8 of them choose according to the food expire date and 5 of them checks the food ingredients. Therefore, it can be said that for most of the respondents the price factor has a great importance in comparison with other characteristic mentioned above. In part (c) of this section, the approximate time that participants spend for their food type purchase was questioned (Figure 4.5)

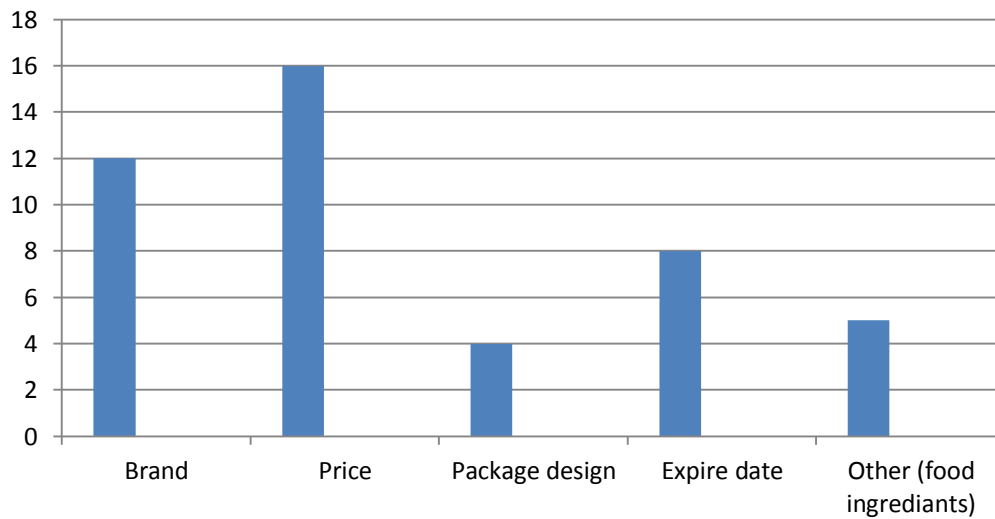


Figure 4.4: Food Type Characteristics

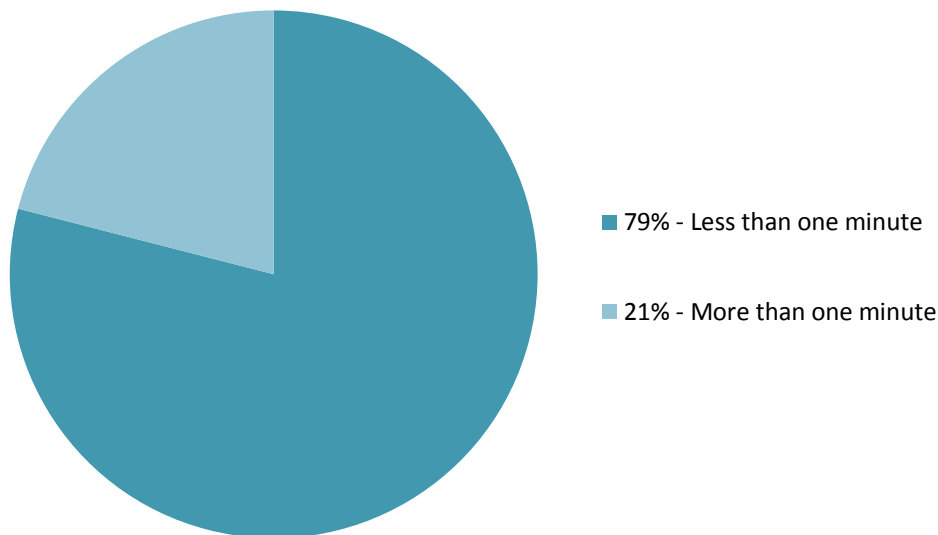


Figure 4.5: Time of decision-making

According to figure 4.5, 79% of respondents approximately decide on their food product in less than one minute. This data shows that any provided information on package should be so clear that consumers could perceive it quickly.

2. Food package design:

This section investigates the way consumers connect package design attitudes to food package design. The question of ‘food package design’ section aims to explore

participants' attitudes regarding the food package design. In order to help participants, the packaging design elements (color, material, text, and image/illustration) were mentioned in question. The participants were asked to select the most specifying element that usually helps them to realize their purchase. By focusing on package design elements, this question results were significant in the sense of clarifying the package element that consumers communicate more. Moreover, in case of adding information and guidance related to sustainability context to a package, this question results uncover the package element that consumers pay more attention. Therefore, they can be more informed about sustainability and sustainable consumption behavior. Figure 4.6 shows the distribution of package design elements that participants selected:

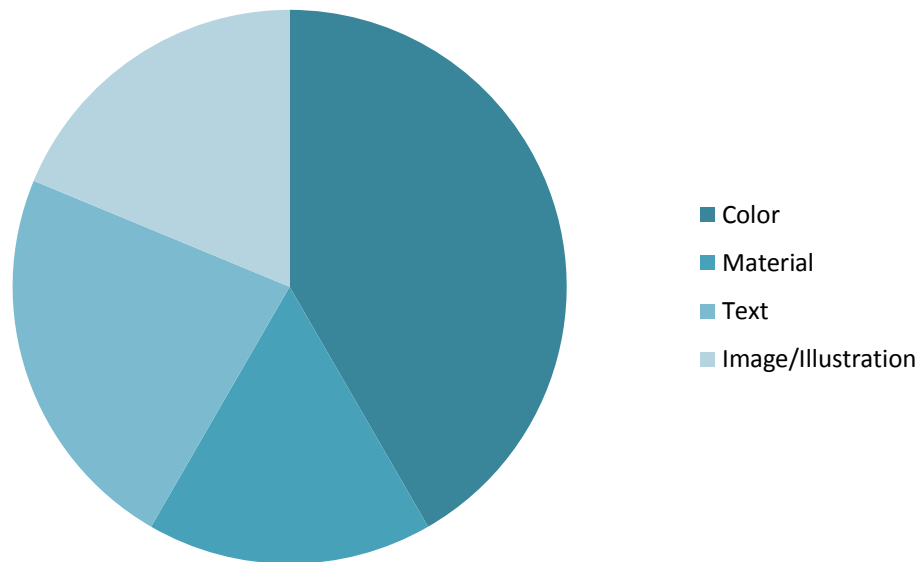


Figure 4.6: Food Package design

According to the figure 4.6, nearly half of participants usually made their choice with the aid of 'color' element. Color is a fast perceivable element; therefore, the obtained data seems logical. Figure 4.6 demonstrates similar sections for the rest of elements, material, text and image/illustration. 9 of 45 participants, selected image/ illustration element as an element that they pay attention first. As image/ illustration mostly do not require consumers to separate time to perceive, therefore this element can play important role to guide consumer to purchase. 8 of 45 participants found text element as an package element which they look first in a package. As texts provide

information on packages, some participants declared that were willingly to spare time to read the texts on the package and if existed, follow the instructions on it. 8 of 45 students selected material as the decisive element that they look for while purchasing a food product. This was due to the feeling that they got from the package material such as artificial and durable. The results gathered from this part uncover the possible potential of elements that guidance to sustainability can be applied.

3. Food package and environmental-issues:

This phase considers consumers' thoughts regarding illustrations (images) and information on food packages considering environment and the influence of these elements on consumers' choice and consumption behavior.

The third section of pilot study is about 'Food package and environmental issues'. As consumers' consumption behavior pattern can demonstrate their sensitivity to environmental issues, therefore this section aims to explore the respondents' tendency to sustainable consumption through food packages. This section contains questions regarding consumers' behavior with food packages after disposal, their attitude about food package material considering environmental issues and what they recall regarding to image/illustration and text elements in the basis of sustainability issues. Continuing the information above, in section (a), respondents were asked to describe their behavior while disposing the package (Figure 4.7):

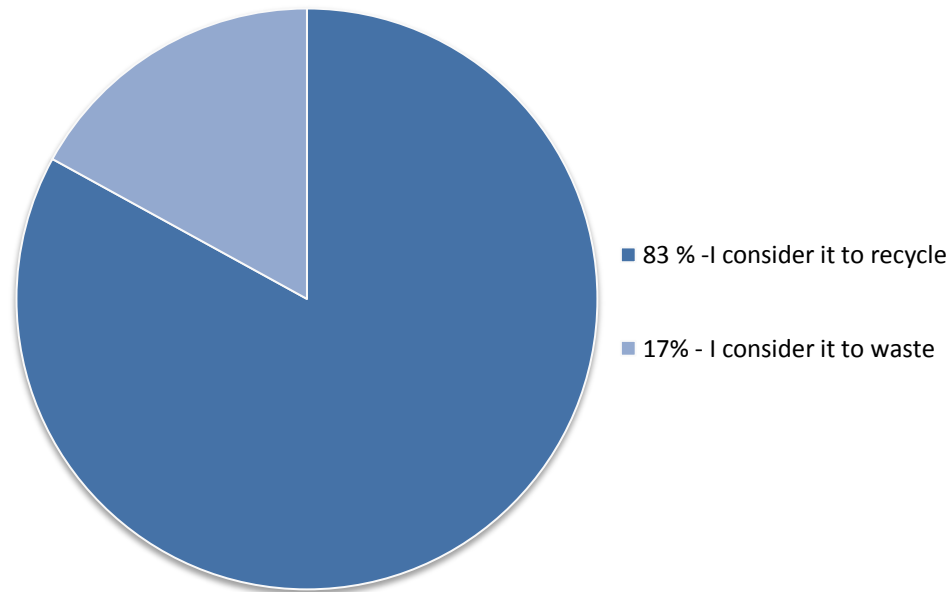


Figure4.7: Food package and environmental issues

83% of respondents consider recycling the disposed packages than putting them to waste. It should be considered that a gap between attitude and behavior may exist in this question. However, this question is designed to explore participants' approach and knowledge about recycling issue. Moreover this question was an introduction to the next question to make them think about the context of recycling. In part (b) of the question, the respondents were asked to select a package material that they consider to recycling. The key point of this question was to investigate the package material that consumers consider to be easy or close to recycling.

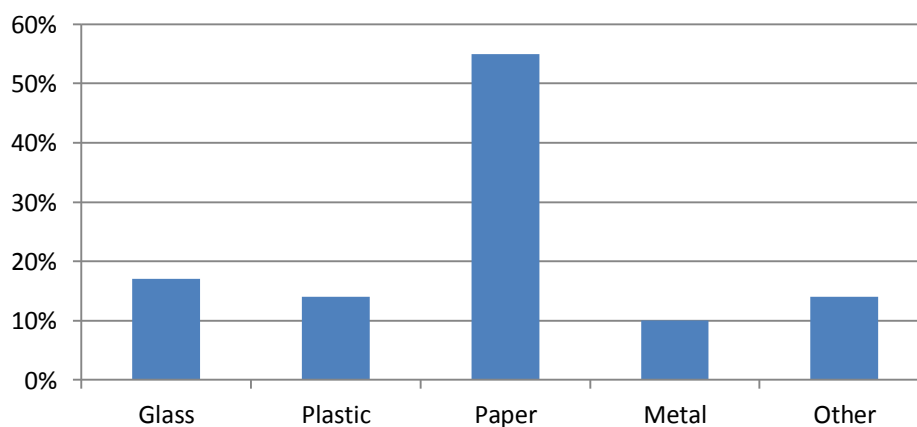


Figure4.8: Package material and recycling tendency

According to figure 4.8, the majority of respondents (55%) chose paper as a material that they were willing to recycle. To respondents, paper is a material that is close to the concept of recycling. This result can be due to respondents' knowledge about paper origin that it comes from trees. Those of respondents who chose glass mentioned the re-usage aspect of these packages. This feature provides them to collect more glass bottles than other materials. While asking consumers about the element that recall 83 % of respondents mentioned about the Mobius loop – recycling logo (Figure 4.9) that they recall more in the basis of package design elements while considering environmental issues.

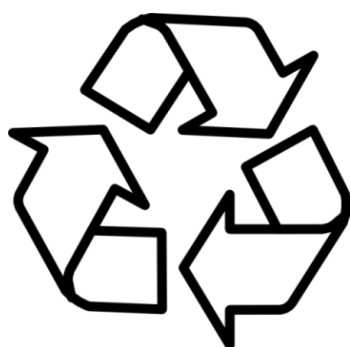


Figure4.9: Mobius loop symbol (Url-13)

According to the Mobius loop symbol definition by Clean Energy Ideas (n.d.), this symbol “indicates that an object is capable of being recycled - not that the object has been recycled. It can be said that Mobius loop symbol is commonly used to identify a product or material, which is suitable for recycling.” Moreover, “The plain logo is usually found on cardboard based packaging to identify that the packaging is recyclable.”

In the pilot study, majority of respondents (80%) referred to Mobius loop as an environmental symbol that is designed to motivate them to recycling the package. According to their statement, they did not find the symbol motivating enough to encourage them to consider recycling the package. Most of respondents declared that environmental-based information and graphics on packages could have important role in guiding and motivating them in considering their waste to recycle.

Conducting the pilot study was helpful to find the key points of the research. The findings of the pilot study (Figure 4.2) can be demonstrated as (Figure 4.10):

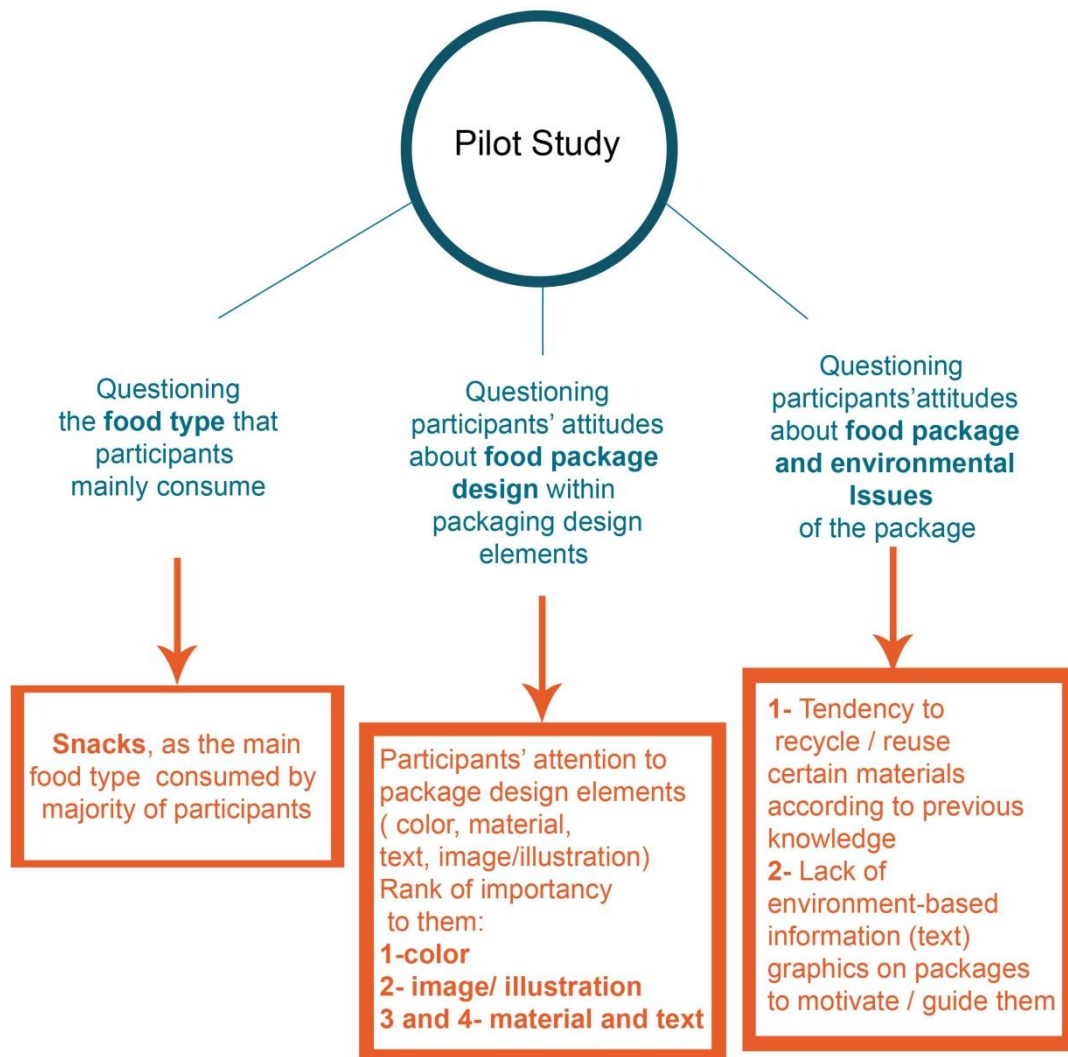


Figure4.10: Pilot Study results

To begin with, conducting the pilot study on university students as sample group demonstrated that the food type they mostly consume is from snacks category. This result can also be supported with fast life-style of sample group and fast consumption behavior. For majority of respondents price of the food package was the most important factor among its brand, package design, expiry date and food ingredients. In second section, participants' attitudes regarding food package design was questioned. The question was based on the four packaging design elements (color, material, text and image/illustration). The results showed that most of respondents were firstly attracted by color element of food package. Image/illustration was the second element that they considered to pay attention and then, material and text of the package. In third section, which was related to environmental issues of the food package, the aim was to explore participants' attitudes regarding their behavior in

context of sustainability and sustainable consumption. For this purpose, this section started with a general question regarding participants' behavior after they consumed the food package content and they decided to dispose the package. Majority of respondents declared that they consider the packages waste to recycle. Afterwards, they were led to think about the material of the package, which they desired to recycle. Among glass, plastic, metal and other materials people were likely to put paper packages to recycle. It can be resulted that participants had former knowledge and experience in their mind regarding recycling of papers. Moreover, participants declared that they were interested in reusing the packages made of glass. Therefore, in the base of material, a tendency to recycle and reuse the food packages was obtained. This result was promising since it supported the sustainable consumption behavior. The last question of this section was related to the information related to environmental issues on packages and participants' attitudes about them. For this aim, consumers were asked about what they recall about environmental issues on food packages. The result of this question was significant that it could help the study to investigate new ways to inform and guide consumers to sustainable consumption. Majority of respondents pointed out to Mobius loop as the symbol they recalled while considering environmental issues. However, they thought that this symbol did not inform and motivate them at all in the sense of how, where and why to recycle, reuse, or etc. Hereby, it should be mentioned that in an interview (See Appendix A.4 and Audio podcast on thesis CD)with Doğan Erberk (2011), Secretary General of Packaging Manufacturers Association of Turkey, this symbol is more company-oriented rather than motivating consumers to recycling. In other words, the Mobius loop symbol shows the producers that whether the material can be recycled or not and in that case, "...the recycling symbol may contain a percentage inside of the loop. This is commonly used to identify a recycled product, and what percentage of the product contains recycled materials" (Figure 2.2). Therefore, a lack of environmental information for consumers in package was realized. This information can be designed with the aid of some or all of package design elements.

In order to sum up the findings of phase 1, the pilot study demonstrates that sample group prefers snacks as the food type they mostly consume. Furthermore, packaging design elements play important role in helping them to select their food. According to the findings of this phase, a lack in environmental-based information on food

packages was obtained. However, the sample group demonstrated their tendency to recycle/reuse certain package materials.

4.2 Phase Two: Observation and interview

4.2.1 Observation in Finnair Airlines

Due to being an exchange student in Finland in the time of phase two, the observation was realized in Finland and specifically, it was during a trip in Phase 2 (Figure 4.11) from Finland (Helsinki) to France (Paris) via Finnair Airlines.



Figure 4.11: Overview on Phase 2

During the flight, the presented meal package in Finnair airline (Figure 4.12) was found relevant with the scope of this research and the pilot study results.



Figure 4.12: The presented meal in Finnair Airlines

In order to specify this relevance, three factors can be mentioned:

- 1- The Finnair airline's meal was in Snacks food category, as the same data has been gathered in first phase of pilot study (food type).
- 2- The material (cardboard) of the Finnair airline's food package has been made of paper that according to the pilot study results, it evoked the feeling of recyclability in participants.
- 3- According to the following observation, the information designed on Finnair airline's food package appeared to be guiding and motivating passengers.

Next section highlights the way that observation conducted together with pictures, which were taken during observing passengers. Afterwards, the results of observation and its analysis are described. As it is shown in figure 4.12, the package material was made of craft paper and the color palette was created an environmental feeling look. Considering the image/illustration, there was a leaf above the text, which supported the ecological appearance. The Mobius loop has been placed in front surface of the package. According to figure 4.13, in one side of the package, there was an informative text that was guiding passengers to what to do with the package after having their meal. The informative text was, *"After your meal, please place the cups and wrappers outside the box and flatten the box."* The phrase of *"...place the cups and wrappers outside..."* guide consumers to think about the

different materials of ‘cups’ and ‘wrappers’ and understand that they should be recycled separately.



Figure 4.13: Informative text on Finnair Airlines package (a)

Figure 4.14 demonstrates a text in backside of the package. The text says, “We’re pleased to inform you that this product is produced from first-class ingredients. The board used to make this sandwich pack & the material used for the window are recyclable & compostable”.

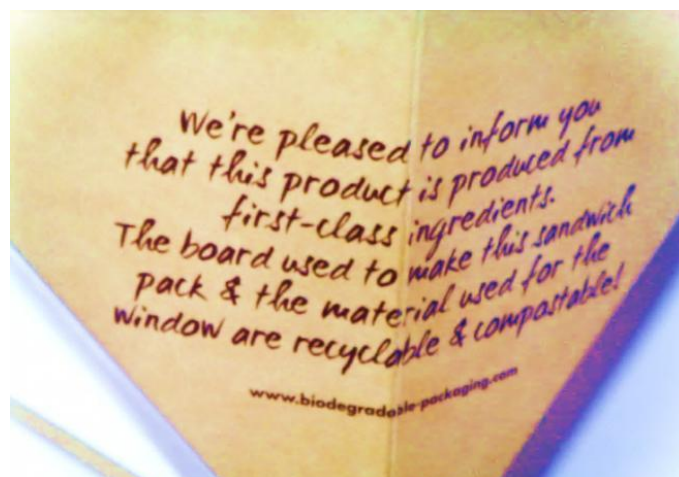


Figure 4.14: Informative text on Finnair Airlines package (b)

The first section of this sentence is regarding to the sandwich inside the package and the second section describes the recyclability of sandwich pack and its window. It is

significant to highlight that, as an airplane is a place where people are waiting to reach their destination therefore, it is estimated that they had more time to read the texts and follow the instructions in comparison to their daily lives. As a result, the package was so close to the scope of this study. Moreover, considering development process of research the observation and its results were properly matched with the results of the pilot study. Therefore, it was decided to evaluate the observation conducted during the flight via Finnair Airlines. According to the place and circumstances of observation, observing a limited number of passengers was possible. It was noted that at first passengers had a fast look at the food package handed by airline host. This look can be done to be inform about the content of the sandwich. After consuming the food, the passengers started to read and play more with the package. Some of them read the package informative texts and tried to fold as it was instructed. Figure 4.15 contains images of passengers reactions to the informative texts. The first image shows a passenger who folded his package properly. Therefore, it can be referred that the information was capable of guiding him to act accurately. Another two images are related to other passengers that seem to know each other. They were observed to be following instructions together and showing the result to each other. This behavior highlighted the motivation aspect of the accurate informative text in package design.



Figure 4.15: Passengers' behavior in Finnair Airlines

Observing behavior of passengers demonstrated a potential to investigate ways to guide consumers to acting sustainability and motivating them to sustainable consumption behavior. Therefore, a visit to the Finncatering Company (Figure 4.16), the producer company of the food package that supplies for Finnair airline seemed to be helpful in gathering more data. Firstly, an email was sent to Pirjo Punakallio, Manager of Finncatering Company. He directed the email to Harri Harjula, Product Development Manager and after his response; a visit was arranged to Finncatering Company.



Figure 4.16: Finncatering Company (Helsinki, Finland)

4.2.2 Interview with (supplier of the food packages for Finnair Airlines)- Finncatering Company

As a part of this phase (Figure 4.17), a semi-structured interview-based questionnaire (See Appendix A.3) was prepared before visiting Finncatering Company. The key

points of the interview questions with Harri Harjula, Product Development Manager of Finncatering Company were based on investigating:

- the way and reason that Finncatering company came up with the idea of current Triangle Sandwich package design : from the perspective of material and information on the package
- the companies or markets which have demanded for these food packages and the reason of the demand
- the feedback of (costumers') consumers of these food products , if any research have been done on this issue



Figure 4.17: Interview with Finncatering Company

According to Harjula, Finnish airlines' companies started to revise the current food service system in their airlines in 2010. These companies had a huge amount of food package waste in each air travel and it had become a serious environmental impact. Therefore, Finnish airline companies gathered to make decisions regarding this problem. Another problem was lack of enough room in airplane divided for food package wastes. Finnair airline, as one of Finncatering customers, informed the catering about the revision they have decided on existed food service and requested them to alter the existed product line. Then Finnish airlines' companies decided to generate ecological solutions in 2010 with the power of package design. They revised the product life cycle in different places it exists. Thus, this revision started from the food package material, which should be to be recyclable and compostable. Then package color was required to evoke the concept of environment and sustainability. Thus in combination with material, brown craft cardboard was selected. The color of texts was selected to look natural such as green. The texts needed to be simple and descriptive. They should not be so long that could bore consumers. Moreover, texts should be informative and guide them directly to what they should do with the package and why is that beneficial. Sometimes supporting elements with each other may have a powerful effect on consumption behavior. To illustrate, supporting craft cardboard with environmental information and combining these with images/illustrations make the package more guiding to consumers. Human mind is capable of relating different concepts. Thus in order to guide consumers to sustainable consumption, package elements should be designed in a way that they support each other with the aim of sustainability. Harjula continued that Finnair had received positive feedbacks regarding passengers request for more ecological food products.

Harjula stated that Finncatering customers are not only airlines but also known markets in Finland like Stockman. However, the significant difference between Finnair Airlines and Stockman was the package design they desired. Stockman, in contrast to Finnair airline was not so sensitive to environmental issues. There are some similar food package designs around the world. However, the best-known one is Colpac - food packaging producer company in England. By receiving food packages' samples by Colpac, Finncatering started to generate its own food packaging. Harjula mentioned that Finncatering got inspirations from Colpac

products in the basis of images/illustrations and the text that inform people about the ecological side of food packages and guide them through sustainable consumption. For example, Finncatering got the idea of the text “*Thank You!*” (Figure 4.18) from Colpac packages since Colpac received positive feedbacks in terms of motivating consumers to sustainable consumption behavior. Thus, Finncatering decided to place the “*Thank You!*” message on the food package right under the folding instructions to be more motivating to sustainable consumption.

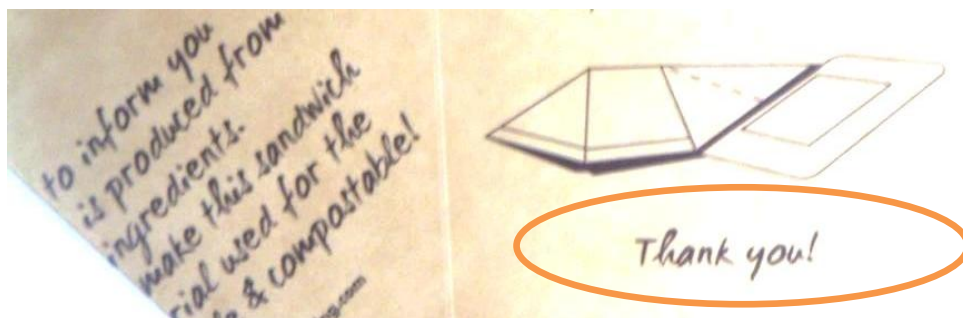


Figure 4.18: ‘Thank You’ message on package

In final part of interview, Harjula presented other package designs not only designed by Finncatering Company but also their sample collection from other companies in different countries. According to Harjula, these samples were designed with different priorities of sustainability and environmental issues. In other words, some of the packages he showed were designed completely in sustainability context while some others were not so sensitive about environmental issues. Therefore, interview with Harjula continued with his analysis of the packages he presented. Next section focuses on the descriptions he mentioned about each food packages.

4.2.2.1 Food packaging samples presented by Finncatering Company

1. Package Sample by Finncatering Company

Figure 4.19 demonstrates a sandwich package designed by Finncatering Company (Finland) for its own brand. Harjula started with the color of the package. The color is brown that is similar to the color of craft paper **material**. This color selection evokes naturalness of the package together with its content. The color of the texts is chosen black. The **text** of the package informs the consumers about the materials that have been used and their recyclability. Below this text, there is a web-page link is referred in case consumers were eager to gain further information about

sustainability of the package. Moreover, the guidance to sustainable consumption is supported with an **illustration**. This illustration demonstrates how consumers can help the recycling process with just folding the package in a way that different materials place separately.

According to Harjula, the package gives a sustainable feeling with its environmental-friendly look. Each element of this package has been designed considering environment and guides consumers to sustainable consumption by the information it encapsulates.



Figure 4.19: Package Sample by Finncatering Company

2. Package Sample by Dailymonop

Figure 4.20 shows a package designed by Dailymonop Company (France). The **color** of the package is pink that is eye-catching for a food package. Black and white colors are chosen for the colors of texts. According to Harjola, the **material** of the package is made of cardboard that is semi biodegradable. The **texts** on the package contains a, 'delicieux' word (a French word that means 'delicious' in English) on the front side of package that is placed above the window. In one side of the package, there is a

French phrase saying that the Dailymonop Company cares about environment and the card board of the package is made of biodegradable carton. In this package **image/illustration** have not been designed. This package is partially sustainable but it seems that the design's first priority has not been creating a sustainable look at first sight.



Figure 4.20: Package Sample by Dailymonop

3. Package Sample by Colpac Company

The package in figure 4.21 is designed by Colpac Company (England). According to Harjula, the **color** of the package and the illustrations are made a powerful reference to sustainable context. The package color is brown for its craft paper **material** and the illustrations are in green color. Color of texts is chosen to be white. According to the **text** that is in form of circle, the material is 100% biodegradable and compostable. There is also a motivating text which says ‘By buying this pack, not only do you get a lovely bite to eat but you also get to **DO YOUR BIT** for the environment...’ and then by saying ‘..Let’s explain..’ it refers to more information regarding sustainability and sustainable consumption in other side of the package.

The **illustration** consists of green leaves in front side and close to the window of the package. According to Harjula, the package as a whole has a powerful reference to sustainability context with each element of package design.



Figure 4.21: Package Sample by Colpac Company

4. Package Sample by Colpac Company

Figure 4.22 shows a package that is designed by Colpac Company (England). The colorful **color** palette of the package is due to the images that are placed in surfaces. The **material** of the package is from compostable cardboard however; the percentage of compostability is not mentioned. One of the **texts** says that,

“We’re pleased to inform you that the board used to make this sandwich pack & the material used for the window are biodegradable, recyclable & compostable! The food grade safe inks, coating & glue are compatible with the biodegradation process & therefore do not affect the quality of any resulting compost! Please dispose of this packaging responsibly.” While discussing this description with Harjula, he mentioned that they liked the idea of first sentence phrase, *“We’re pleased to inform you that the board used to make this sandwich pack & the material used for the*

window are biodegradable, recyclable & compostable!'. Therefore, they got permission from Colpac Company to use this phrase on Finncatering Company's package designs. With the permission they got, Finncatering Company has placed the phrase on the food packages it supplies. In **Image** element, the package encapsulates the images of a unique nature to support the environmental aspect of the package. In another side of the package, these images are defined as, "The images featured on this pack were taken at Folly Wood, part of Flitwick Moor. Colpac donated to an appeal by The Wildlife Trust to buy this important woodland. This unique wood boasts a rare collection of birds, insects and plants and it recognized as a nationally important site of Special Scientific interest." According to Harjula, this package design elements support the sustainability context. However, in the first sight it does not create an environmental-friendly look in consumers' mind. He concludes that texts should not be over length because consumers may feel bored to read it and act toward the way it guided.



Figure 4.22: Package Sample by Colpac Company

5. Package Sample by Colpac Company

Figure 4.23 demonstrates a package that is designed by Colpac Company. The **color** of the package is brown due to the craft cardboard **material**. However, apart from the material color there is not any color, which evokes sustainability. Some informative **texts** on package say, “*Here at Origin Foods we care about the environmental impacts of our products. This pack is 100% biodegradable and compostable – even the window. Please dispose of the pack carefully, and if you can, compost it.*” Below this text, there is a symbol of recycling together with the word ‘recycle’ in order to define the symbol. Beside the recycle symbol, a text says that, “*When you have finished with this item please recycle it.*” According to Harjula, these informative texts refer to the context of sustainability and sustainable consumption in a descriptive way. Other texts refer to the ingredients of the content and its nutrition values. The **image** element of package contains a black and white picture of a farm that supplies the food. According to Harjula, it would be more guiding for consumers if it was chosen in color.



Figure 4.23: Package Sample by Colpac Company

6. Package Sample by Colpac Company

This package (Figure 4.24), which is designed by Colpac Company, has a brown **color** due to the craft paper **material**. The colors of texts are chosen to be green that supports the context of environmental-friendly. The **texts** mention that, “Sandwiches are pretty simple ... Here at Morrisons we believe in keeping things simple. This tasty sandwiches has been made for you today- here in store, in our kitchens, by our wonderful stuff, using simple, everyday ingredients. We hope you enjoy eating your sandwich. We enjoyed making it for you.” According to Harjula, this text ensures consumers about natural content rather than artificial. Moreover, a joyful **illustration** informs consumers about sustainable consumption. It says that the packaging is partly recyclable: carton is recyclable but not the window. Moreover, package has trimming dots’ section that guides consumers to flatten the package after consuming the content.



Figure 4.24: Package Sample by Colpac Company

7. Package Sample by Colpac Company

Finnccatering Company has designed the package (Figure 4.25) for one of its customers, ABC Deli food. The **color** of the package is bright yellow and its

material is made of cardboard. The window is made of soft material. Harjula mentions that while they got the order from ABC Deli food, their priority was an appealing and attractive package design. Therefore, Finncatering Company came up with this package design. For the **texts**, ABC Deli food requested for the words such as “*fresh*” and “*handmade*”. The **illustration** that can be seen on the package is the logo of ABC Deli food. According to Harjula, as the aim was not presenting an environmental-friendly package therefore it neither has an environmental-friendly appearance nor it has been designed sustainably.



Figure 4.25: Package Sample by Colpac Company

8. Package Sample by Finncatering Company

The package in Figure 4.26 is a design by Finncatering Company for a customer named Stockman Company in Finland. According to Harjula, the customer has determined the **color** of the package as black previously. Therefore, Finncatering Company suggested them cardboard **material** and they accepted the suggestion. However, the package is not from recyclable material as customer’s priority was not an environmental-friendly package and they desired it to have a luxurious look. Therefore, the black color was given to the package as it was mentioned before. The green color was given to highlight the brand name. The **texts** contain the food

ingredients and their nutrition values. There are not any **illustrations/images** designed in the package.



Figure 4.26: Package Sample by Finncatering Company

Conducting the interview with Finncatering and discussing the package samples with Harjula demonstrated the wide range of package designs. As the scope of this study is to explore food package design's role to guide consumers to sustainable consumption therefore package samples presented by Harjula during the interview could have a high potential in this study. The potential was due to the diversity of the packages design elements. In other words, they were different in colors, materials, texts and images/illustrations. Based on this differentiation, some of the packages were designed sustainably in order to guide consumers to sustainable consumption, some of them were designed sustainably but they did not have any reference to guide to sustainable consumption and the rest were the packages that were not designed sustainably without considering guiding consumers to sustainable consumption.

Therefore, it was decided to evaluate the packages presented in the interview with Finncatering Company. Interviewing with Finncatering Company demonstrated some package designs with the potential of guiding consumers to sustainable

consumption. Likewise, the main question of this study is how design can guide consumers to sustainable consumption. In order to investigate the answer for this question, it was decided to explore design role on guiding consumers on the packages from Finncatering Company.

4.3 Phase Three: Interview with students

The aim of this study is to investigate design role on food packages that can guide consumers to sustainable consumption. For this purpose, one method can be testing different food packages in terms of sustainability on consumers. According to the results obtained from interview with Finncatering Company, this diversity can be categorized as: packages which look and are sustainable, packages which do not look sustainable but are sustainable and packages which do not look/ are not sustainable. However, testing all packages presented by Finncatering Company could make the data analysis hard. Therefore, three packages among eight packages were selected to be tested on focus group. In order to test this, following the first phase (pilot study) and second phase (observation in Finnair airline and interview with Finncatering Company), the third phase -main research- was conducted with a larger group of participants (N= 65) from Istanbul Technical University students (figure 4.27). This phase introduces the process of three package selection for main research and the criteria for selection and continues with data collection and analysis tools used throughout the research.



Figure 4.27: Overview on Phase Three

4.3.1 Criteria for package sample selection

The criteria for three package selection (Figure 4.28) was decided to be packages' difference between their appearance and reality in the context of sustainability in order to investigate the different ways of guidance and compare them to each other (Table 4.1). In other words, choosing three packages among the ones which were different from each other in term of looking / being sustainable, looking but not being sustainable and neither looking/ nor being sustainable, can lead the study to distinguish package design elements that can guide consumers accurately to sustainable consumption.



Figure 4.28: Sample Package selection

Therefore, three packages (Figure 4.28) from Finncatering Company were selected with the criteria of being snacks. Three fake sandwiches out of sponges were made and placed inside the packages to give respondents real feeling of sandwich package and they were coded as Package 1, Package 2 and Package3.

Table 4.1: Criteria of package selection

Samples	Appearance	Reality
Package 1 	This package has an environmental-friendly look with its material (cardboard), the color palette (craft paper and green), the images of leaves and a text, which informs consumer about biodegradability aspect of the package.	It is 100% biodegradable, so the package is completely in correspondence with its environmental - friendly look.
Package 2 	This package's material (cardboard) gives the feeling of eco-friendly. However, the pink color does not connote the environmental - friendly concept. The package has not illustrations on it but large amount of texts about the content	In package, there is a text that mentions about biodegradability aspect of the package. However, the percent of it is ambiguous.
Package 3 	The material of this package does not give an environmental- friendly look. The yellow color of the package has made it far from the environment caring concept. The illustration of the package contains the logo of the food brand. The text of the package refers to the 'freshness' aspect of the food.	Being honest to its appearance, this package is not environmental-friendly.

The main phase of research was done in Istanbul Technical University and to 65 (30 female and 35 male) students. For data gathering, semi structured interview was

applied and respondents' thoughts were recorded with voice recorder in order to analyze the answers more precisely afterwards. As the interview questions were in descriptive form, the front area of main library in Istanbul Technical University (Ayazağa campus) was selected, as students rest and chat with their friends in that area. Therefore, they could have had some spare time for the interview. These packages were placed in a cardboard tray (Figure4.29).

The interview process was completed within a week and at the end of the week, 65 participants were gathered in total. The interview was conducted with going among students' group with packages' tray three times a day in order to obtain. Most of them were interested to join the research probably due to the “*This is a Master thesis research*” paper linked to the tray and the colorful appealing sandwich packages. The data gathering of interview was completed in a week, all data was extracted and analyzed. The semi-structured interview was considered for interview-based questionnaire. There were two main questions. Before starting the interview and by showing the respondents the packages' tray, it was mentioned that the (fake) sandwiches were all same in terms of brand, price, expire date, content and size. As according to the pilot study, brand, price, expire date and food content were among important factors for consumers in their food selection.



Figure 4.29: Sample package tray

Then the interview started with first question that was about selecting the food package that respondents desired. In first question environmental aspects of the packages were did not mentioned in order to get respondents' primary selection of packages. The purpose of this question was also to investigate whether respondents were sensitive to environmental issues on food packages or not. In second question, environmental aspect of packages was mentioned. Therefore, by reminding environmental issues, second question's aim was to investigate respondents' selection while considering not harming the environment. This was designed to compare the first and second questions' responses and analyze the differences and similarities. In the first question, respondents selected their desired package in a shorter time than the second question. In the second question when the context of environmental was mentioned, they thought for some more seconds and afterwards they replied.

4.3.2 Interview-based questionnaire:

The interview started with asking general questions to respondents and continued with the study's focused questions.

- How old are you?
- What is your department?
- In your department, what is your academic degree?

1. Consider that sandwiches are totally same in:

- brand,
- price,
- expiry date,
- content,
- and size

Which one of these packages would you select?

2. If you consider to make your selection without harming the environment, **NOW** what will be your package selection?

In order to analyze the obtained data, the recorded interviews were transcribed to text format. Through this process, transcriptions were written on post-its (Figure 4.30).To

simplify the analysis, the bottom sections of post-its were colored according to the color of the package selected by respondents. Figure 4.30 demonstrates some of transcriptions of respondents who selected Package 1, Package 2 and Package 3. The complete transcriptions of each package were placed in Appendix A.5.

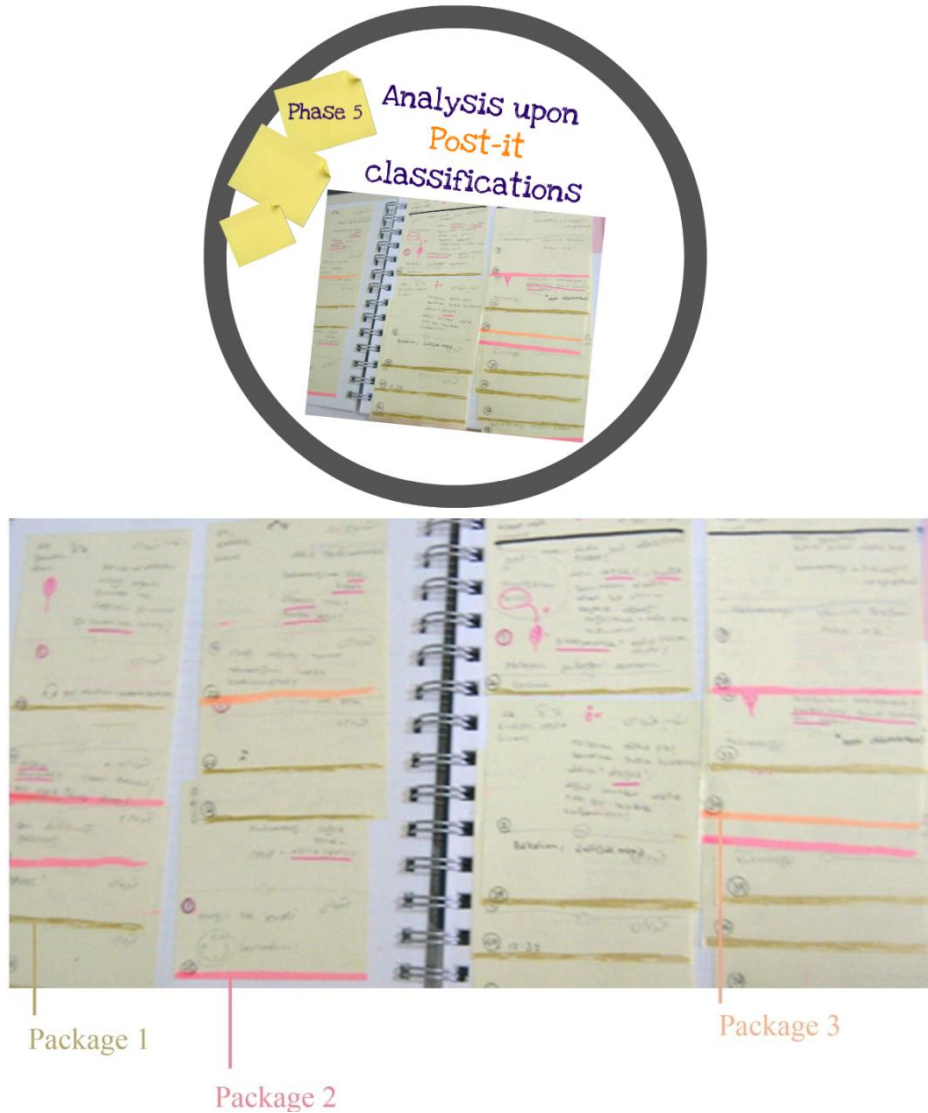


Figure 4.30: Classification of responses on Post-its

In order to obtain valid data, the sample group was selected from students with different majors. It was decided to get responses from students from different departments. This was also the reason of selecting the area of interview in Istanbul Technical University, which all students with different departments were gathered. In the campus, the sample group consisted of 65 students that 35 of them were male and 30 of them were female. The age range of the participants was 18 – 32 years old. 48 of participants were in bachelor's level, 13 of them were in master's and four of them

were in doctorate level. The distribution of participants' departments is shown in figure 4.31.

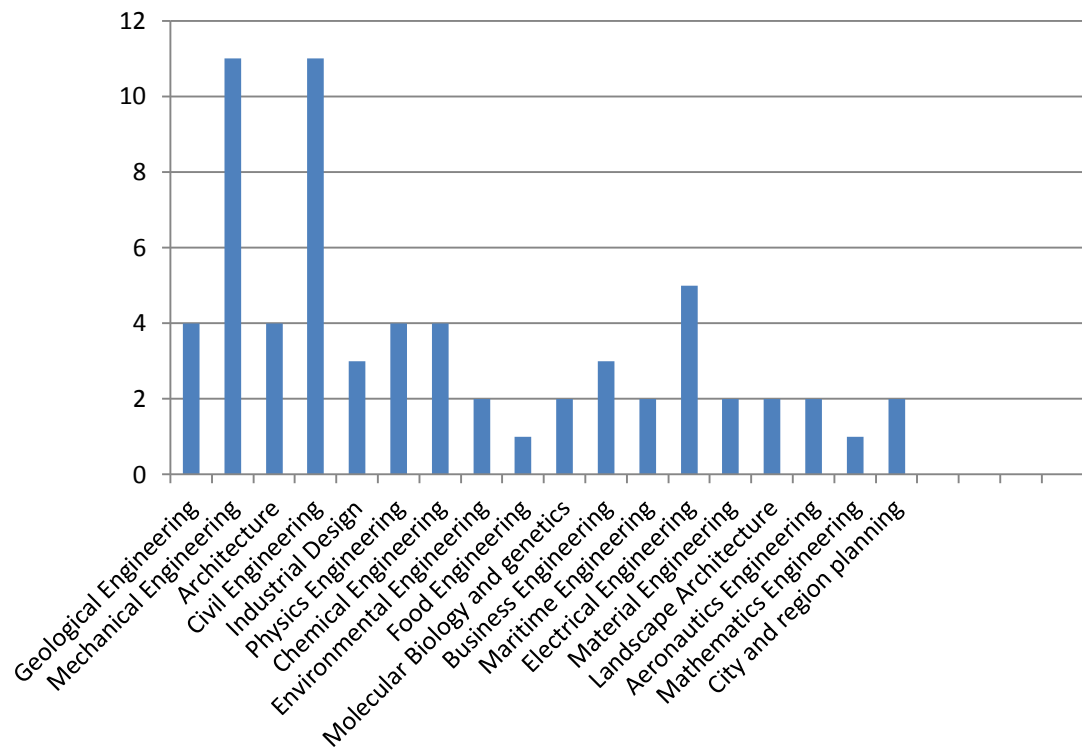


Figure 4.31: Distribution of participants' departments.

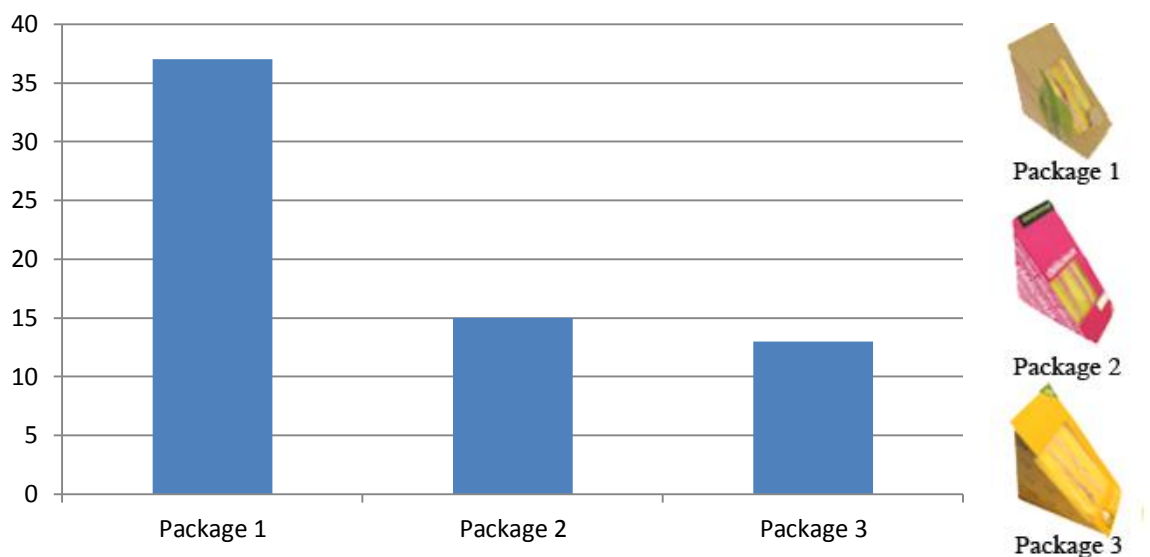


Figure 4.32: Package selection distribution

The results of the first question that is shown in figure4.32 highlight that in first question, 37 of 65 people chose Package 1, 15 of them selected the Package 2 and 13 of them selected the Package 3. As it was mentioned previously, in this question

nothing was mentioned about environmental issues concerning the package. Thus, respondents selected the food package they preferred according to their feeling whether considering environmental issues or not.

The gender classification seemed to be significant for it was estimated to be differences in male and female respondents' selection. This could be due to their different life styles. Therefore, an analysis was carried out based on gender-based selections.

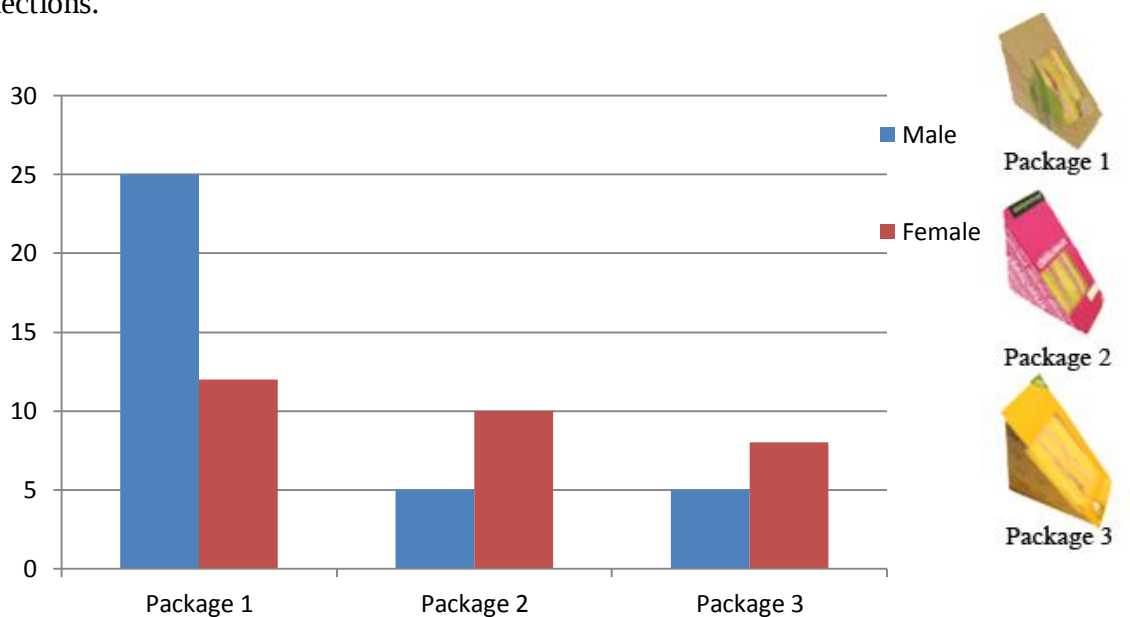


Figure 4.33: Package selection distribution based on genders

According to figure 4.33, the majority of male and female respondents chose Package 1. Among respondents who chose the Package 2 and Package 3, female respondents chose these packages more than male respondents.

In the second question, respondents were asked to select a food package that they consider that not harm the environment. The respondents' selection was demonstrated in figure 4.34.

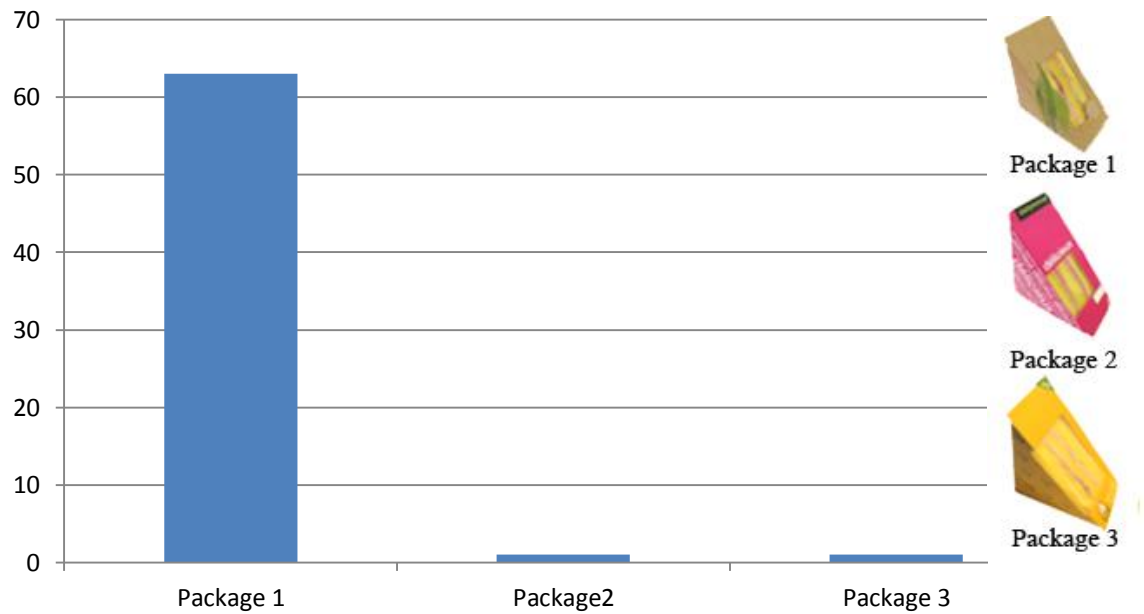


Figure 4.34: Distribution of participants' answer to second question

According to figure 4.34, results showed that a big majority of respondents ($N = 63$) out of 65 students chose the Package 1 in the response to second question. Therefore, the primary result that was gained from this figure was the influence of guidance to environmental aspect of the package. In other words, in case of designing package design elements more directed to environmental issues, consumers can choose the package with less impacts on environment.

Considering the package design elements that were discussed in previous sections, an analysis was done about the text element. The elements of package design such as material, color and image/illustration, can be perceived more rapidly than text element. Therefore, consumers should spare more time to read the texts on the packages.

According the results of interview and observing respondents while selecting the package, it was decided to provide an analysis on respondents' reading behavior of the texts about environmental issues. Three different behaviors were observed in terms of the time respondents started to read the environmental based texts on the packages. As respondents behaved in three different ways, their behaviors were categorized to three groups.



Group 1 consists of respondents who read the text/ information in first question and before mentioning the environmental issues of packages, group 2 consists of respondents who started to read the text/ information after asking the second question and group 3 consists of respondents who neither read the text before second question nor after it. In order to test this behavior on all respondents, the analysis was conducted separately on total respondents who selected Package 1, Package 2 and Package 3. Firstly, the responses of respondents who had chosen the Package 1 were analyzed:

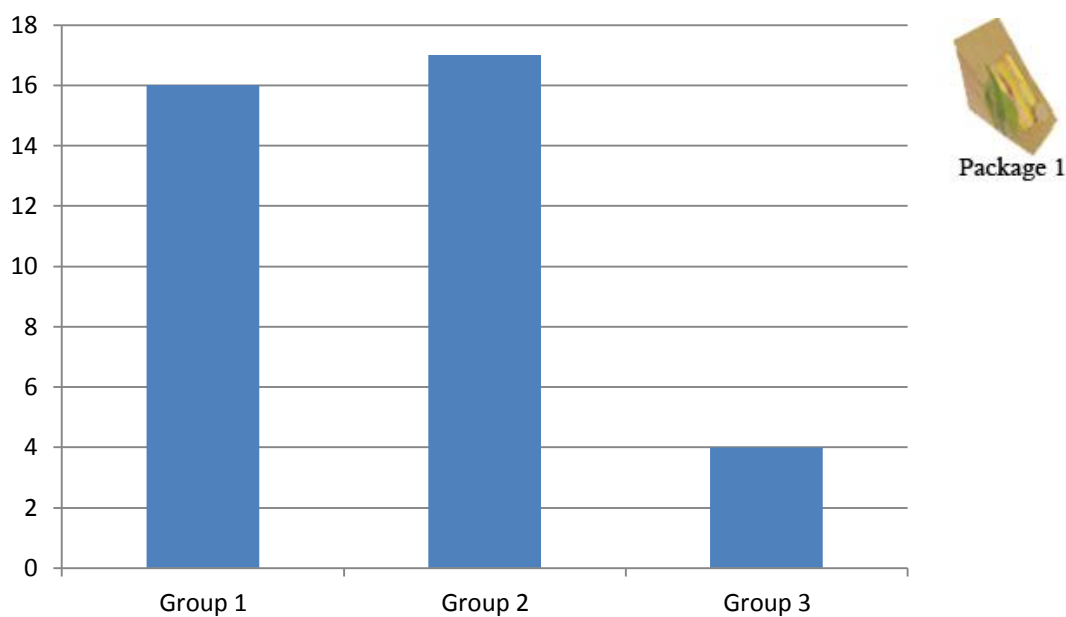


Figure 4.35: Distribution of Group 1, Group 2 and Group 3 in selecting Package 1

According to Figure 4.35, 16 of respondents who had selected Package 1 (group 1) read the texts of the package after first question, 17 of them read the texts after the second question (group 2) and 4 of them (group 3) neither read before the second question nor after it. The texts were in front side of package that mentioned about ‘100% biodegradable & compostable’ in white color and in circular form. This data demonstrated that the majority of respondents who chose Package 1 spared time to

read the texts on the package. This showed that besides color, material and illustration elements they have searched for written elements to support their selection in terms of environmental issues. After asking second question and directing respondents to environmental issues, group 2 respondents started to examine the package in terms of finding information regarding the environment. Group 3 thought that color and material elements of the package were enough to recognize the package as environmental friendly together with they complained about the small size of the texts. In this analysis, according to majority of respondent informative texts were significant in terms of guiding and supporting environmental issues. In analyzing the responses of respondents who had chosen the Package 2 respondents read the text according to figure 4.36.

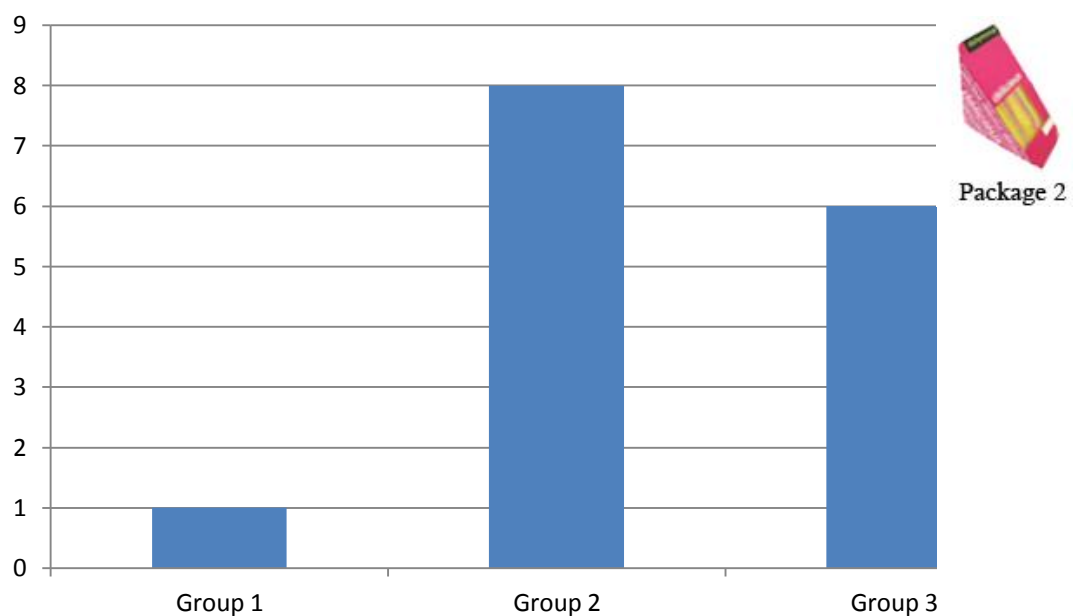


Figure 4.36: Distribution of Group 1, 2 and 3 in selecting Package 2

The respondents who selected Package 2 read the texts on the package showed the following behavior. The text on the package was French and was placed at the backside of the package. It informed consumers that the cardboard material is biodegradable. It should be mentioned that while asking the second question and mentioning about environmental issues, they started to check the package to find clues regarding to being environmental. However, the text language (French) and the high amounts of texts in that part could not guide respondents properly to read the text. Therefore, after the interview when it was clarified that the cardboard material

was biodegradable, the respondents could not believe that. As a result, in order to guide consumers to read information on packages, color and amount of text should be considered properly.

Final part is related to the responses of respondents who had chosen the Package 3 (figure 4.37).

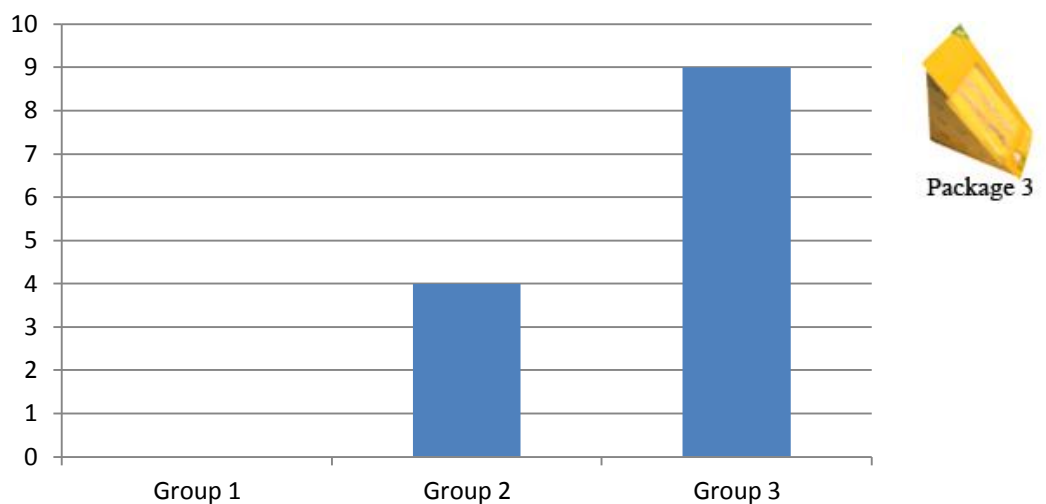


Figure 4.37: Distribution of group 1, 2 and 3 in selecting Package 3

The texts on Package 3 were about the content of the package by mentioning the words ‘fresh’ and ‘hand-made’. Therefore, there was not much information on the package. Moreover, as it was mentioned in previous stages, Package 3 was not an environmental friendly package and its design elements were not designed environmentally oriented. According to figure 4.37, respondents who selected Package 3, did not read the texts in first question (Group 1). After asking the second question that mentioned about environmental aspect of the package, 4 respondents (Group 2) started to find information in terms of being environmental-friendly, they found the words “fresh” and “hand-made” and then they decided that the content is more important than environmental aspects. It can be resulted that in order to guide consumers to sustainable consumption proper texts are essential. For when consumers do not see any information regarding environmental issues, they can forget these issues, convinced by advertising aspect of the package and decide to buy that suddenly. Package 3 showed the importance of informative texts regarding to sustainability in packages, which are designed sustainably. In order to finalize the stage of this analysis, it was obtained through the interview that texts have significant role in guiding consumers to select the environmental-friendly package. However,

the size and colors of the texts should be designed properly to make it easy to follow for consumers. High amounts of texts should be avoided that they fail to direct consumers to environmental oriented information. Moreover, the placements of texts are another important aspect in consumer guidance to sustainable consumption. According to the results of this interview, consumers usually do not spare much time to check all sides of packages. Therefore, texts should be placed in proper places on a package in order to attract attention of the consumers. In this study, according to the richness of the obtained data, an inductive path was selected. The analyses section firstly began with a quantitative analysis of two close-ended questions, afterwards it continued with content analysis of the responses that were achieved during the interview. Content analysis is a method for analyzing both qualitative and quantitative data. Moreover, it is a commonly used method in analyzing both qualitative and quantitative data to make inferences from the text. For conducting content analysis, data can be gathered through different mediums including textual (i.e. interview transcripts), audio (i.e. speeches) and visual data (i.e. photographs). Moreover, content analysis, according to Krippendorff (1980) is “a research technique for making replicable and valid references from data to their context.” According to Krippendorff (1980), the sequential nature of content analysis designs follows data making, data reduction, inference and analysis. In order to classify the data and transform it into a meaningful form, codes and categories can be utilized in the content analysis that was mentioned by respondents. Therefore, in first stage the data was gathered between the two open-ended questions mentioned in previous sections. This data contained respondents’ personal attitudes and thoughts regarding packages and its design elements. After coding the data, a cluster of adjectives, which were mentioned by respondents, were obtained. Afterwards, the distribution of the adjectives mentioned by selectors of each package were subtracted and demonstrated. Besides, in order to categorize respondents’ attitudes regarding each package they selected, the data was analyzed in the form of design elements color, material, text and image/ illustration. Table 4.2, demonstrates the cluster of adjectives that was obtained from data.

Table 4.2: Cluster of adjectives about Package 1, Package 2 and Package 3

Natural	Artificial
Trustworthy	Unfaithful(Deceptive)
Cheerful	Sober
Attractive	Repulsive
Ecological	Non-ecological
Durable	Fragile
Outstanding	Common

For each package design that respondents choose, they were asked to describe their responses.

4.3.3 Analysis of packages:

a) Respondents who selected Package 1:

As it was mentioned previously, Package 1 consists of a 100% biodegradable material (cardboard and film). The responses can be expanded according to the adjective cluster (Table 4.2) obtained. The distribution of the adjective clusters is shown in figure 4.38.

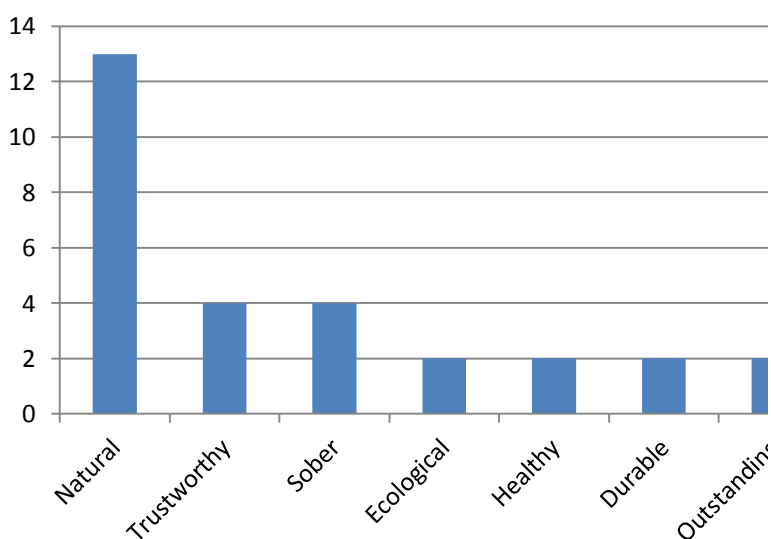


Figure 4.38: Adjective distribution regarding Package 1

13 respondents (N = 37) mentioned the word “natural” for their choice of the Package 1.

There were other adjectives, which were based more in respondents’ emotions, such as nostalgic, earthy and hygienic / unpolluted. Some of respondents pointed out to the responsibility aspect of Producer Company of Package 1 owns.

Further analysis is implemented on categorizing respondents’ reasons for selecting the food packaging. This categorization was done according to the package design elements: color, material, text and illustration/image.

Respondents, who selected Package 1, mentioned that the brown **color** of the package evokes the natural feeling, ecology and nostalgia.

To some respondents the color connoted trees and soil. The majority of male respondents mentioned that they normally do not prefer the color of package 2 (pink) and Package 3 (yellow) in their daily lives. Regarding the crafted paper **material**, respondents found the package durable, sober, recyclable and hygienic. The material also connotes natural (organic) content. Some respondents touch the package material and found it appealing. The material led respondents to get the feeling of luxuriousness. According to Figure 4.35, 16 of 37 respondents who chose the Package 1, read the **text** on the package. These texts were designed in front, side and bottom surfaces of the package. They thought that texts should be more motivating in terms of color and dimension. However, they found the information quite directed to the environmental issues. Considering the **illustration** element of packaging, green leaves on Package 1, had taken the majority of respondents’ attention. They found the green leaves illustration appealing and close to the concept of sustainability. Some respondents have previous background regarding to environmental-friendly products in the base of their color and material.

After analyzing respondents’ attitudes regarding the Package 1 they had selected, they were asked about their thoughts’ on Package 2 and Package 3. Table 4.3 shows the cluster of adjectives of overall (N=37) respondents.

Table 4.3: Cluster of adjectives of respondents who chose Package 1 about Package 1, 2 and 3

Package 1	Package 2	Package 3
Natural	Artificial-look	Toy-look
Trustworthy	Cheap	Cheap
Sober	Repulsive	Repulsive
Ecological	Processed-look	Unhealthy
Healthy	Feminine	Fragile
-	Eye-straining	Common

b) Respondents who chose Package 2:

12 of respondents who chose Package 2,(N=15) pointed out that the pink **color** is so appealing for a food package. 9 of female respondents mention that they normally prefer and use pink color in their daily life. Most of respondents found the color so appetizing and out-standing. Some believed that it is so promising package in terms of containing delicious food. One of the factors that most of respondents mentioned was the glossiness of the package **material** that made it more appealing.

Furthermore, 13 of respondents (N = 15) pointed out to the **text** of “*delicieux*”) which means delicious in English. However, to them it evoked the same meaning in English language probably by containing similar letters in the word. According to respondents, the package was become more outstanding with placement of the ‘*delicieux*’ right above the transparent window. One of the packages contained multiple amounts of ‘*delicieux*’ word and in different sizes. Some respondents believed that more text could refer to better quality than other packages with fewer texts. However, some other respondents mentioned that placing high amounts of texts can strain the eyes. Figure 4.39 shows the cluster of adjective that respondents who selected Package 2 referred.



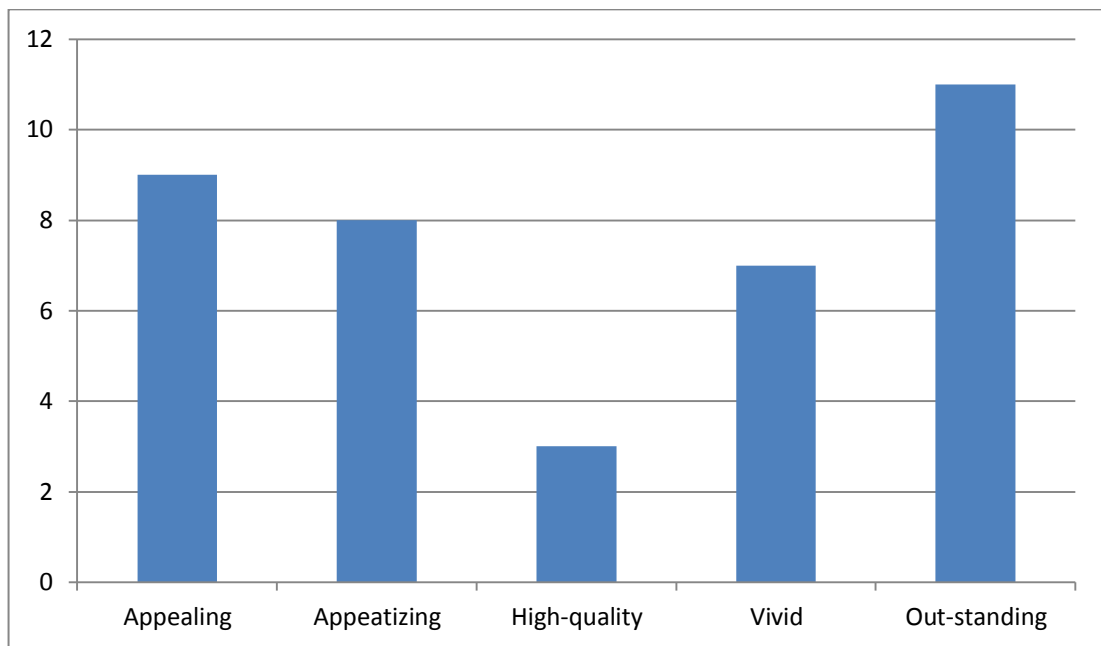


Figure 4.39: Adjective distribution regarding Package 2

After analyzing respondents' attitudes regarding the Package 2 they had selected, they were asked about their thoughts' on Package 1 and Package 3. Table 4.4 shows the cluster of adjectives of overall (N=15) respondents.

Table 4.4: Cluster of adjectives of respondents who chose Package 2 about Package 1, 2 and 3

Package 1	Package 2	Package 3
Ordinary	Appealing	Unhealthy
Imprecise	Appetizing	Cheap
Unappetizing	High-quality	Repulsive
Healthy	Vivid	Artificial
Repulsive	Out-standing	Fragile
Spiritless	-	Common

c) Respondents who chose Package 3:

13 respondents chose Package 3, 11 of them believed that the **color** of the package is attractive. While analyzing the **material**, most of respondents were pleased with the glossiness feeling of the Package 3. However, they did not find the window's material appealing while comparing to other two packages'. This was due to softness of the material that evoked the feeling of ripping easily. One of the strong reasons that made the respondents chose this package was the information provided in **text** that was 'fresh' and 'hand-made'. They easily played with the package and found these texts. Moreover, 5 of respondents found the logo appealing. In **illustration** category, some of respondents described the logo message as "Yes! You are choosing the right product".



In the cluster of adjective, respondents mention (Figure 4.40):

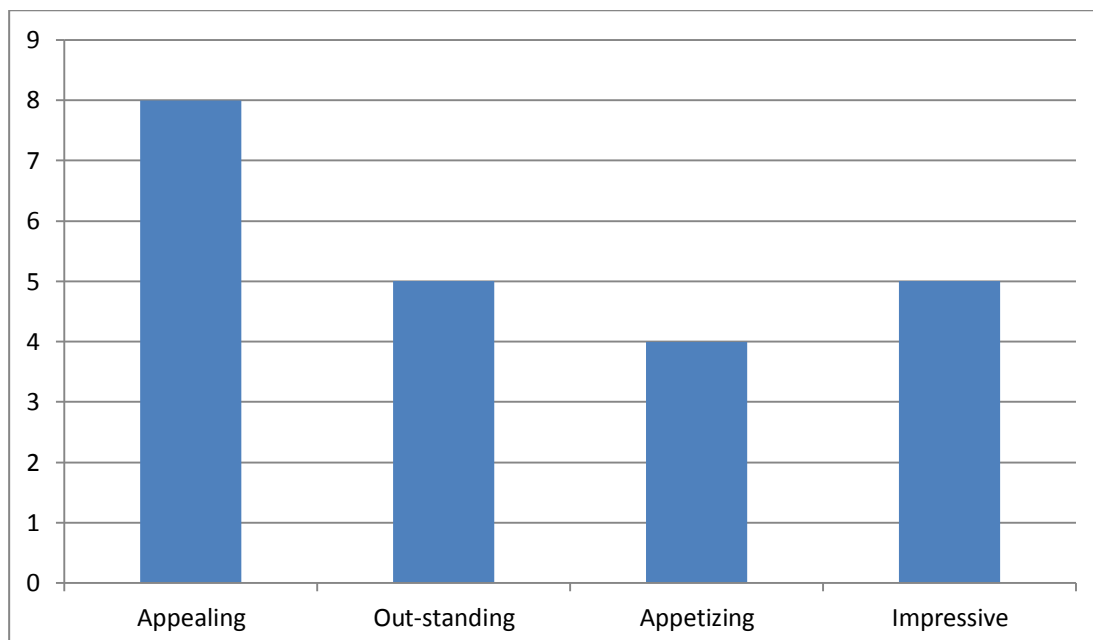


Figure4.40: Adjective distribution regarding Package 3

After analyzing respondents' attitudes regarding the Package 3 they had selected, they were asked about their thoughts' on Package 1 and Package 2. Table 4.5 shows the cluster of adjectives of overall (N=13) respondents.

Table 4.5: Cluster of adjectives of respondents who chose Package 3 about Package 1, 2 and 3

Package 1	Package 2	Package 3
Sober	Feminine	Appealing
Worn	Eye-straining	Out-standing
Unappetizing	Cosmetics-look	Appetizing
Mature	Artificial	Impressive
-	Showy	-

5. CONCLUSIONS AND DISCUSSIONS

5.1 Research Questions Revisited

1. How food packaging design guide consumers to sustainable consumption? Which package design elements (color, material, text and illustration) in particular guide consumers to sustainable consumption? Should all the four elements be designed in sustainable way to realize the guide or applying it to some of the elements is effective?

2. Can consumers differentiate the sustainable packages from unsustainable ones? How? To them, which characteristics imply sustainability and/or unsustainability in concerning food package?

This study was based according to Stewart (2007) packaging design elements: color, material, text and illustration/image. Likewise, findings of the study were analyzed according to these elements. Furthermore, these elements play an important role in describing the product package to consumers. Packaging design for companies are benefit oriented. However, these packages can be harmful for the environment, as their elements are not designed in a way that can return to environment cycle. Therefore, the most essential point is designing each package element environmentally oriented.

Observation and interview with Finncatering Company showed that some package examples that among them there were packages, which had been designed sustainably. However, the question was that whether sustainably designed packages can guide consumers to sustainable consumption or not. In order to test the influence of sustainable packages on consumers and find the answer of question above, it was decided to investigate consumers' attitude regarding packaging design elements and the ways they link those elements with sustainability. Therefore, an interview was

conducted with 65 university students as focus group. In order to explore a holistic view of focus group's attitude not only on sustainable packages but also on unsustainable packages, therefore three different packages obtained from Finncatering Company were selected. Sample group was asked to select the food package that they would like to buy in a shop. Later on, they were asked to describe their answers. In these stages, analysis was done based on package design elements. In respondents' descriptions, it becomes clear that they utilize package design elements to select their food package. Therefore, these elements can guide them to select a food package among three food packages. Now, considering the first research question, it was observed that sustainably designed packages could be capable to guide consumers to sustainable consumption. This is due to majority of respondents' selection was the package 1- a sustainable package. However, not only them but also respondents who had selected other two packages found some lacks and problems on package 1. In order to categorize these shortages within package design elements, it can be said that:

- **Color:** The color element of package was perceived quicker than other elements (material, text and image/illustration). Although color of package 1 evokes the concept of sustainability, according to respondents it does not look to be outstanding while considering colors of package 2 and package 3. Therefore, in order to guide consumers to sustainability context and sustainable consumption, the color element of the package should be appealing enough to influence consumers in first sight. However, in package 2 the color is so outstanding that it does not evoke the feeling of its cardboard biodegradability. Therefore, package designer can have a significant role in setting the balance between the package design elements and the context of sustainability.

As a result, the color element should be attractive and sustainable simultaneously. Combining these two factors can motivate consumers to select an attractive and sustainable package rather than selecting an attractive unsustainable packaging.

According to respondents, they are interested in sustainable consumption behavior; however, they do not prefer to be imposed through it. In order to motivate consumers to the concept of sustainability and sustainable consumption, this study shows the importance of not being didactic.

- **Material:** During the interview while respondents were describing their reasons for selecting a particular package, majority of them touched the material of the packages unintentionally. They found the craft cardboard material of package 1 stiffer than package 2 and package 3's cardboard material. However, they thought that craft cardboard material of package 1 evokes the feeling of nature and soil in particular. Therefore, according to the results about material element of package design this study suggests utilization of a material that is closer to the concept of sustainability.

- **Text:** In this study, text can be defined as a package element that can hold a variety of information. For example, some of this information is about nutrition values and some is required by law. However, information regarding guiding consumers to sustainability issues is rare. Therefore, it can be said that in this study respondents did not expect to find such information on the packages. Furthermore, reading information on packages requires consumers to spare more time in comparison with perceiving elements of color, material and image/illustration. Therefore, an analysis was specified to respondents' preference toward reading the texts through two interview questions. Majority of respondents read the texts when the second question was asked because by this question they realized that there should be differences among packages. Moreover, when the phrase of "... selection without harming the environment..." (in second question) was mentioned, nearly all of the respondents (63/ 65) selected the package 1.

Some difficulties regarding the size, color and ambiguity of information in some packages were observed. The information on packages should be designed in a way that majority of consumers can read them easily and understand their meaning properly. For example, to some respondents the word "biodegradability" was ambiguous. Therefore, in order to guide consumers to sustainable consumption, the effective approach is designing information that is perceivable by its words and their meanings.

- **Image/Illustration:** The most influential element in guiding consumers to sustainable packages can be environment-oriented illustrations such as green leaves in package 1. Resembling nature, leaves can be considered as adjacent references to the context of sustainability. Therefore, illustration/image element can be designed

with inspirations from natural environment. Moreover, human mind is capable of relating subjects to their context, such as relating green leaves to nature. Therefore, designers can utilize this capability in terms of motivating consumers with environment-oriented illustrations.

To sum up, sustainable packages can be designed by combining Stewart's packaging design elements harmoniously with sustainable packaging design guidelines. By implementing these guidelines such as SPC guidelines and Wal-Mart guidelines, package designers can design sustainable packages, which can motivate consumers to sustainable consumption.

5.2 Limitations

Although, applying multiple analyses were helpful to find answers to the research questions, there were some limitations to the study. To begin with the sample size was small. For it might not be possible to make general statements with a group of 30 female and 35 male participants. Secondly, the last and main interview in the research was conducted in Turkish. Since in qualitative research it is significant to communicate freely with participants and provide detailed information about the research topic. In the stage of presenting the results, the interview was translated to English. Therefore, researcher might be made inferences on the results during translation the process and the analysis of the interview. Furthermore, "content analysis" is preferred as data analysis method. In content analysis, as it is researcher's ability to provide inferences from the text, therefore, the interview was analyzed and coded by researcher.

5.3 Recommendations for Further Research

Since this study is conducted on university students as focus group, the same subject can be studied on other focus groups. To illustrate how old people communicate with sustainable food packages, for they have similar backgrounds in their minds such as growing up in organic farms and utilizing less food packages in comparison with today world.

Moreover, further research can be conducted on various food types and their packaging to investigate new ways of designs through package design elements.

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APPENDICES

APPENDIX A.1: Pilot study questionnaire

APPENDIX A.2: Emails to Finncatering Company

APPENDIX A.3: The semi-structured interview-based questionnaire administered to
Finncatering Company's product development manager

APPENDIX A.4: Interview with General Secretary of Packaging Manufacturers
Association (ASD) – Mr. Doğan ERBERK

APPENDIX A.5: Third Phase Research transcriptions on Post-its

APPENDIX A.6: Presentation Path on Prezi.com

Appendix A.1

Dear participant,

I am a MSc student in Istanbul Technical University and an exchange student in Aalto University School of Art and Design(Finland) for my master thesis.

My focus in my thesis is about evaluation of sustainable consumption awareness among consumers through food packaging and the way it communicates.

In this questionnaire, you can find questions regarding food type, food packaging materials and food package design.

Please be sure that the results will just be used in my study anonymously.

Thanks for your consideration and participation!

How old are you?

• ☐ 18-24

• ☐ 25-34

• ☐ 35-44

• ☐ 45-54

• ☐ 55 or over

Gender

• ☐ Male

• ☐ Female

Food Types

Which food products you mainly consume?

• ☐ Frozen Food

• ☐ Snacks

• ☐ Dried Food

• ☐ Organic Food

• ☐ Dairy Food (i.e. milk)

• ☐ Beverages

• ☐ Other

In below, which characteristics you pay **MORE** attention while purchasing the food type

- Brand
- Price
- Package
- Expire Date
- Other

How much time you spend approximately in order to choose a product?

- ☐ t < 1 min
- ☐ t ~ 1 min
- ☐ t > 1 min
- ☐ Other

Food Package Materials

After consuming the food , what do you do with the remaining package?

- ☐ I consider the ways of Disposing to waste
- ☐ I consider the ways to Recycle

•

Which package materials you prefer to Recycle?

- ☐ Paper(cardboards,...)
- ☐ Glass
- ☐ Plastics
- ☐ Metals
- ☐ Other

Do you desire to keep packages after consuming the content?
Please identify your reasons.

- ☐ Yes
- ☐ No

Which Package materials you desire to keep ?

- ☐ Paper (cardboards,..)
- ☐ Glass
- ☐ Plastics
- ☐ Metals
- ☐ Other

Food Package Design

which symbols on package, you can recall more ?

Do you think that Environmental graphics are enough to motivate you to recycle the package?
Please describe your answer.

☐ Yes

☐ No

APPENDIX A.2: Emails to Finnccatering Company

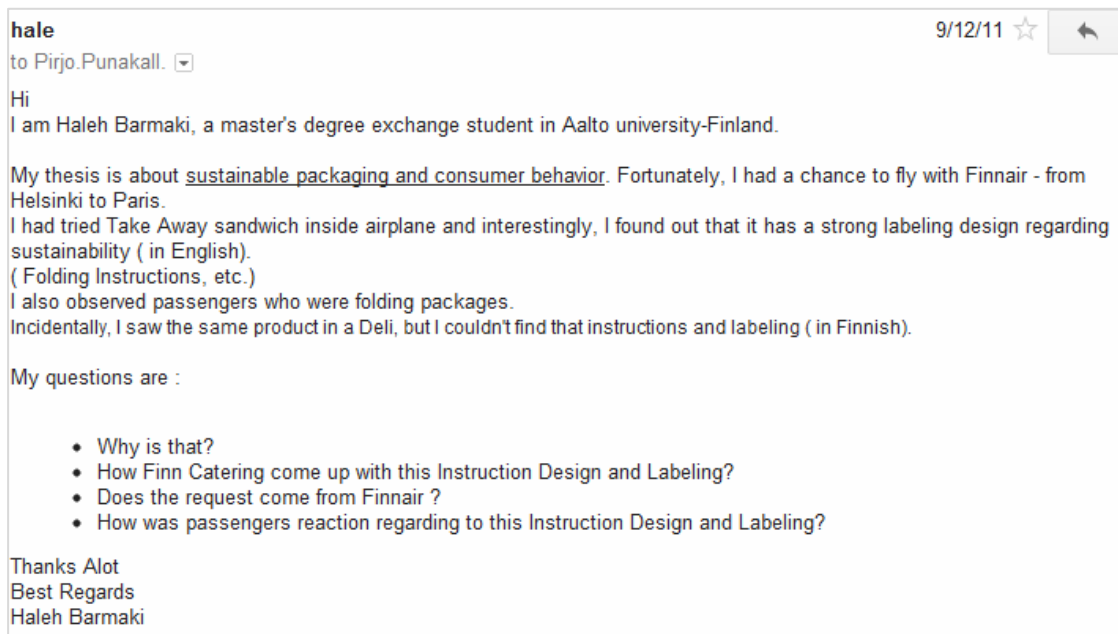


Figure A.2.1: Email; Asking primary questions to Finnccatering Company, the food supplier of Finnair Airlines

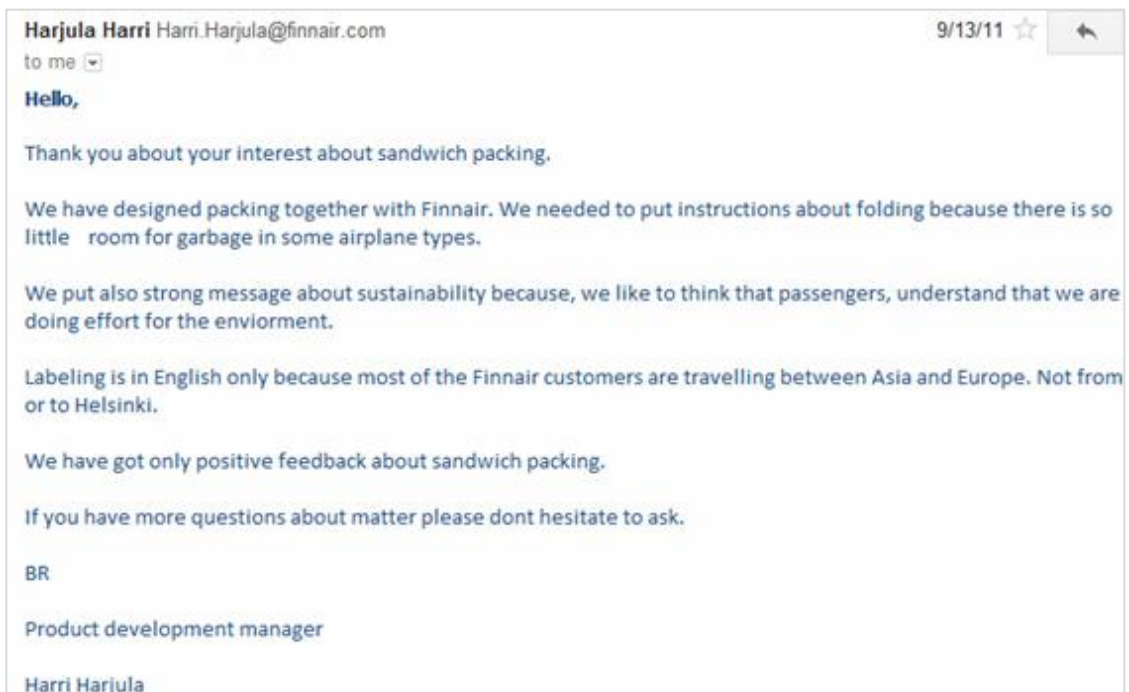


Figure A.2.2: Email; Receiving answers from Finnccatering Company, the food supplier of Finnair Airlines

APPENDIX A.3: The semi-structured interview-based questionnaire administrated to Finncatering Company's product development manager

1. How does Finncatering as a supplier of food and its packages for Finnair Airlines come up with designing informative texts regarding environmental issues?
2. Did Finnair Airlines demand Finncatering for such package design?
3. How was passengers' and Finnair airline's feedback to the package design?
4. Apart from Finnair Airlines, does Finncatering supply food products for other companies? Are they sensitive to environmental issues through the food packages they order placement?
5. Are there similar food packages that guide consumers to sustainability through environmental information worldwide?

APPENDIX A.4: Interview with General Secretary of Packaging Manufacturers Association (ASD) – Mr. Doğan ERBERK

In earlier stages of the study, it was significant to gather general viewpoints regarding packaging sector, its guidelines in Turkey and its placement in environmental issues. Therefore, an interview was organized with a packaging association in Turkey named as Ambalaj Sanayicileri Derneği (ASD) - Packaging Manufacturers Association.

The aim of this interview was to investigate packaging manufacturers approach as members of ASD to the concept of sustainability and sustainable packaging. ASD – Packaging Manufacturers Association in Turkey ASD – Packaging Manufacturers Association in Turkey was established in 1992. ASD’s responsibilities are to bring together important packaging manufacturers in Turkey, fostering the growth of packaging industry, giving an identity to the sector, representing the sector in national and international arenas, establishing scientific, technical, and social cooperation and solidarity among members (ASD, 1992).

In the subject of sustainability, Mr.Doğan Erberk, general secretary of ASD, put his emphasis on natural resources and the danger of disappearing of them in not so far time. By implementing sustainability context to various society actions, environmental issues can be minimized. About package design and designer role, Erberk mentioned that ASD generally proposes designers to design packages considering its whole life cycle that is from production to disposal.

By implementing this, a significant reduction might be visible in environmental impacts. Then, Erberk pointed out to the importance of designers’ role in minimizing the environmental impacts. According to Erberk, “Designers can create the path of eye skimming of consumers, and draw their attention to where they want consumers to see, this is not easy and that is why designers should be creative” Erberk says.

APPENDIX A.5: Third Phase Research transcriptions on Post-its

Figure A.5.1: Third phase interview transcription of participants who chose Package 1

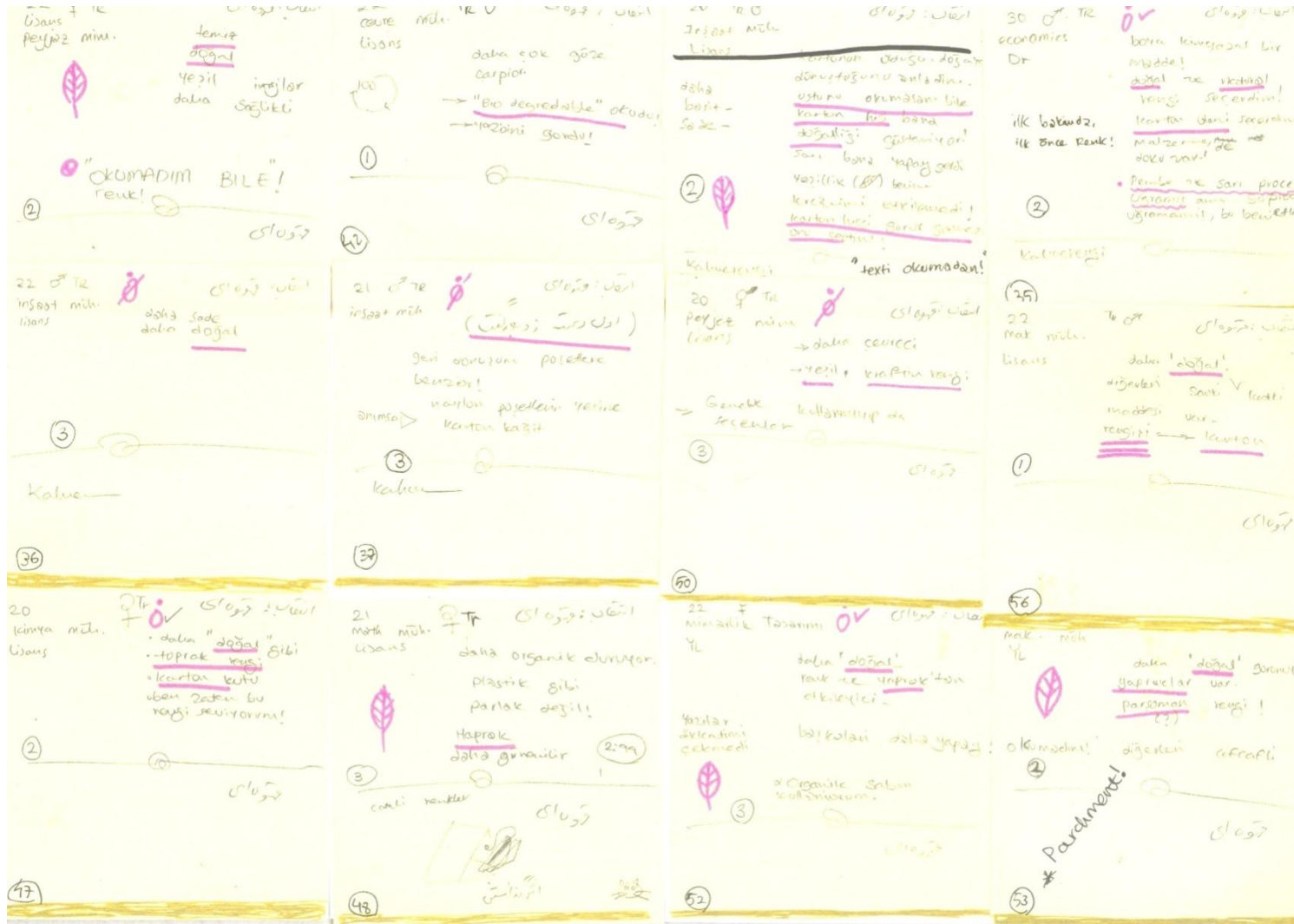


Figure A.5.1(continued): Third phase interview transcription of participants who chose Package 1

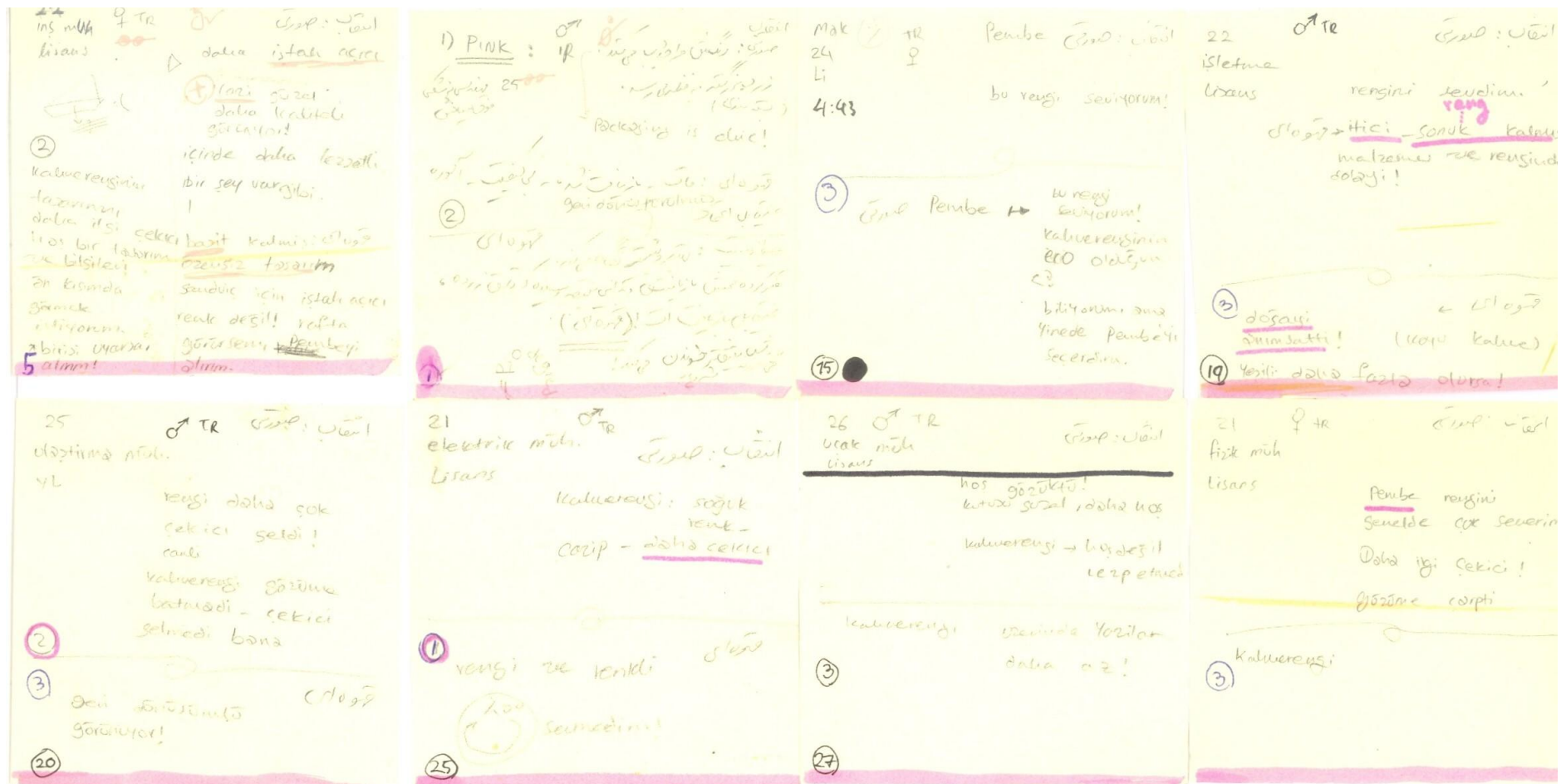


Figure A.5.2: Third phase interview transcription of participants who chose Package 2

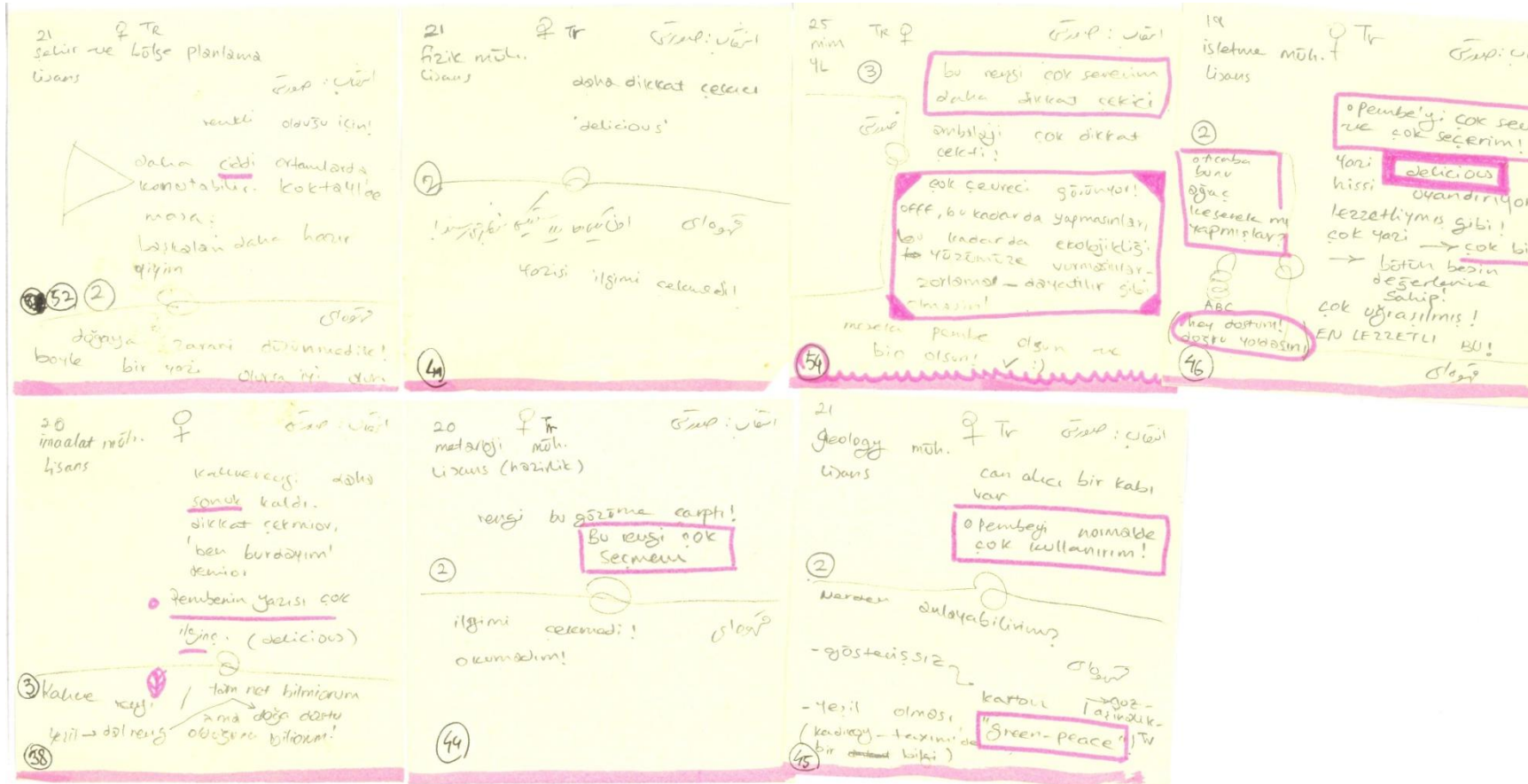


Figure A.5.2 (continued): Third phase interview transcription of participants who chose Package 2

APPENDIX A.6: Presentation Path on Prezi.com

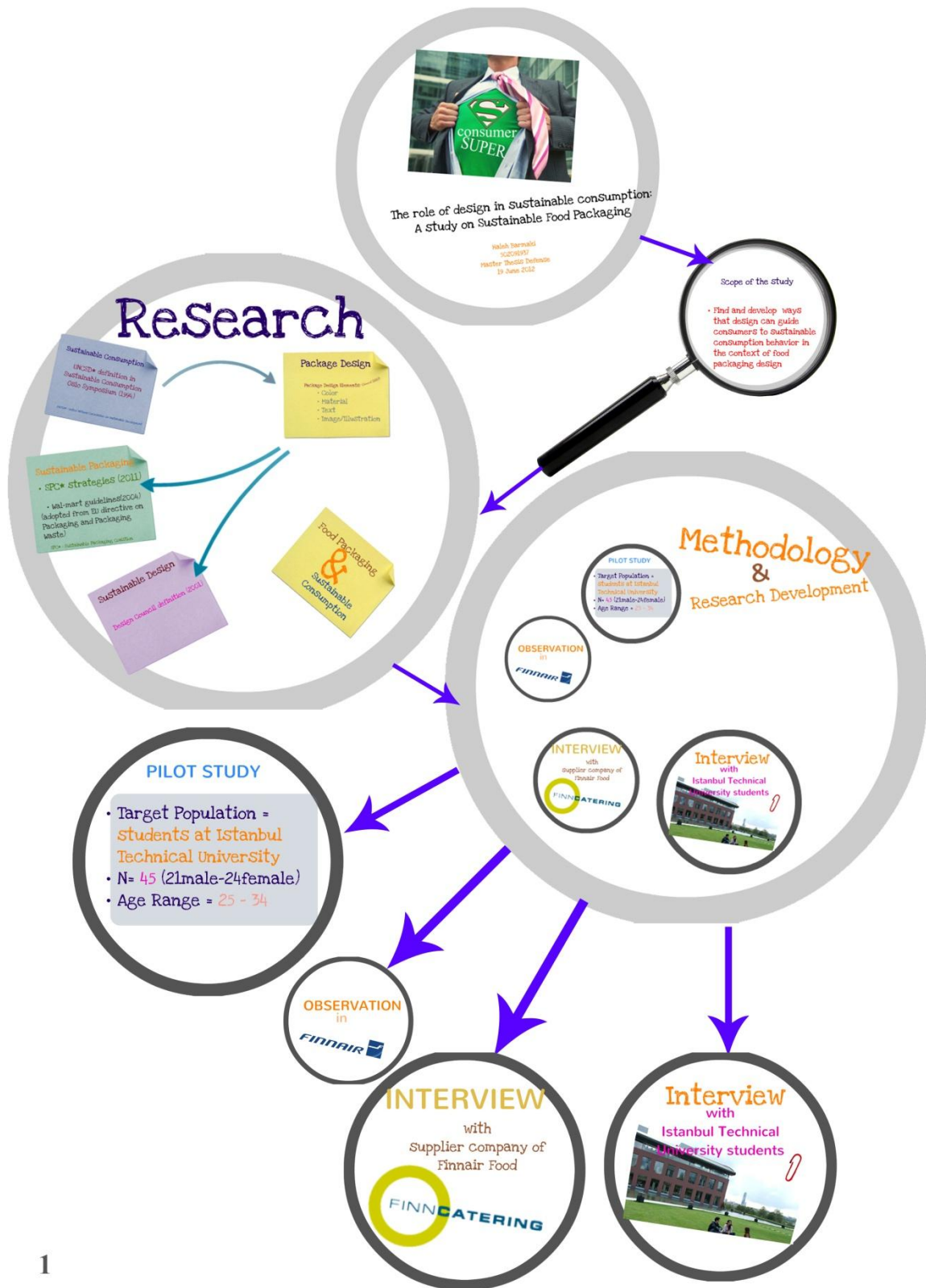


Figure A.6.1: Thesis Presentation Process

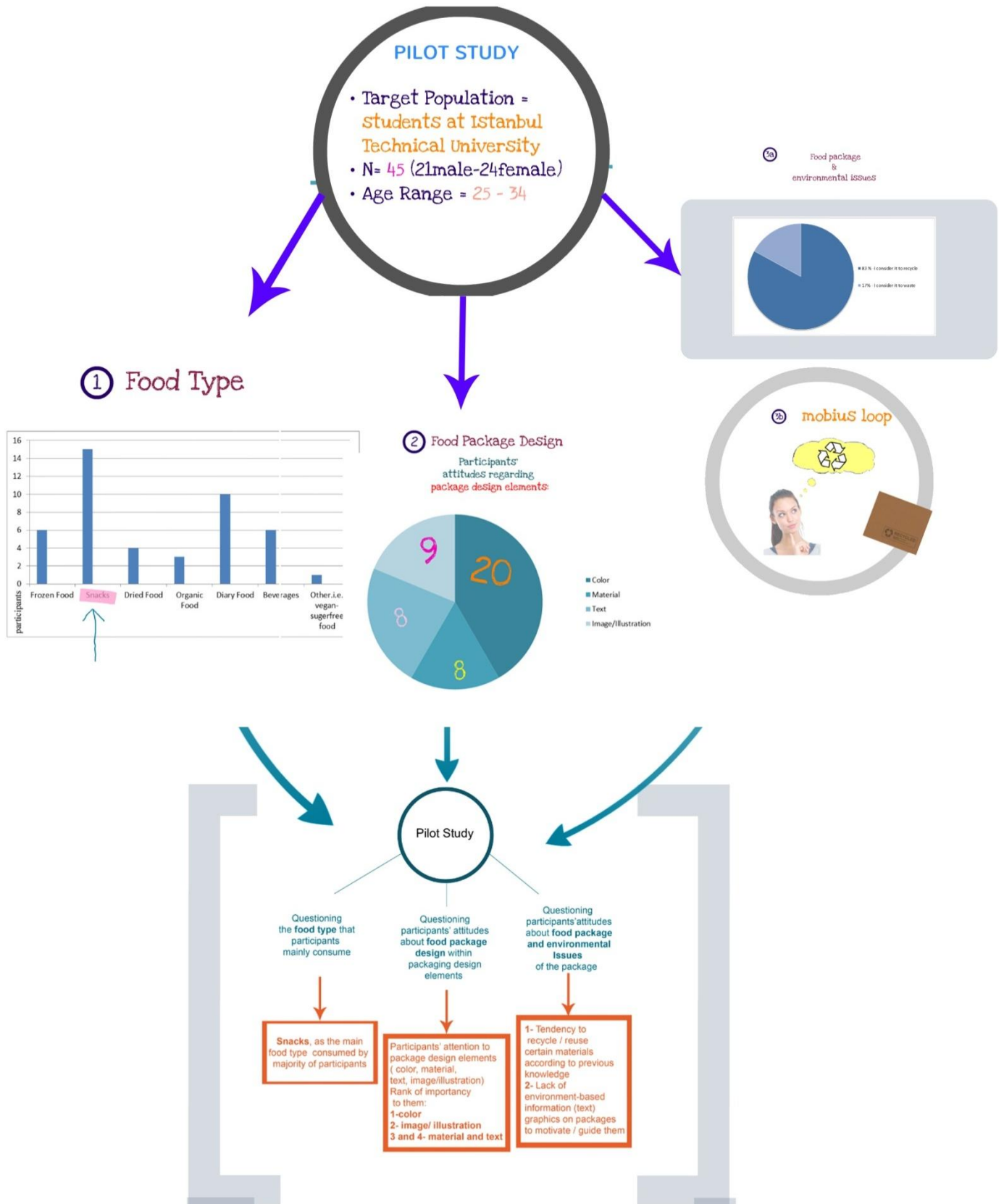


Figure A.6.1 (continued): Thesis Presentation Process



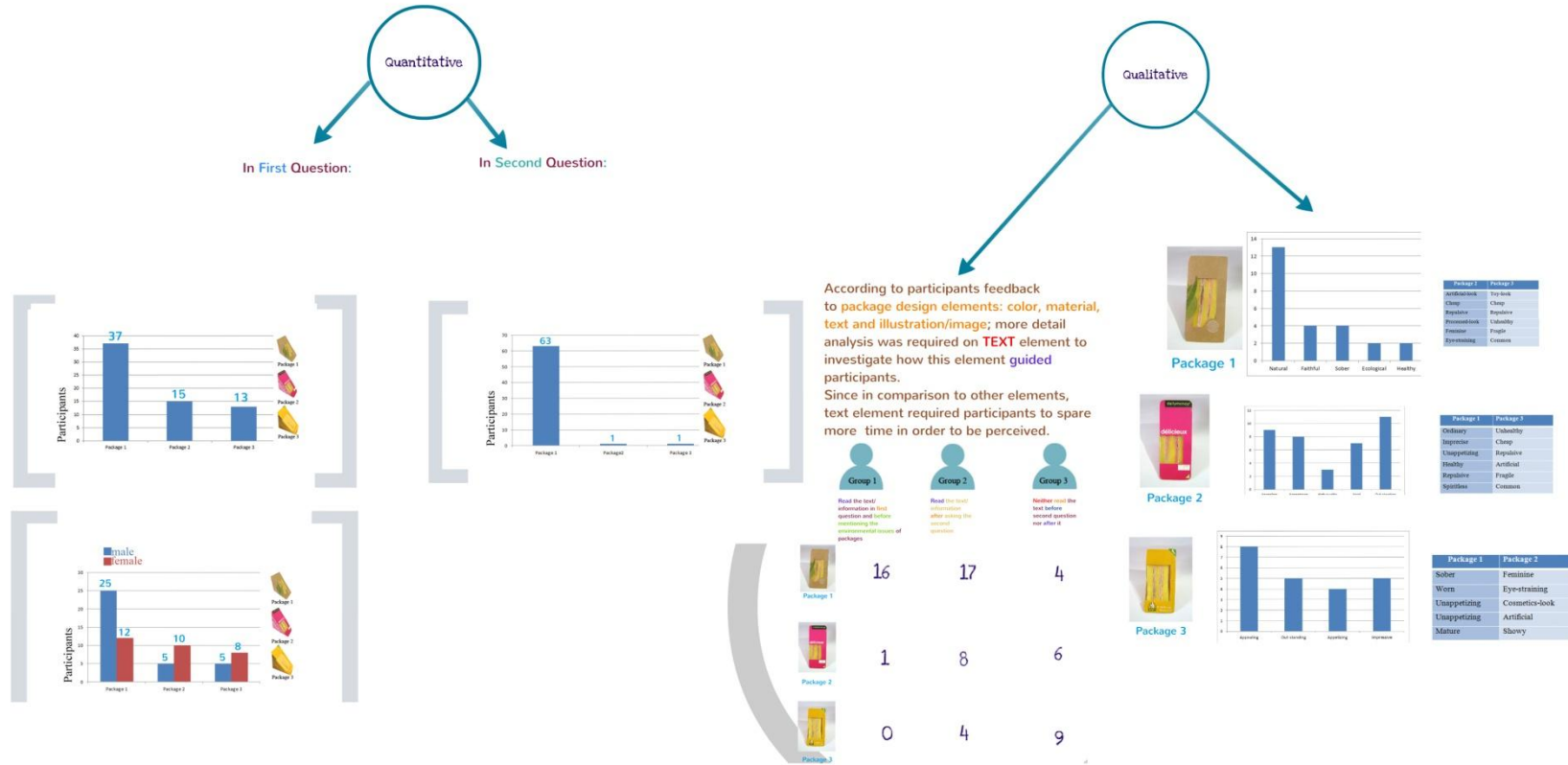
3

Figure A.6.1 (continued): Thesis Presentation Process



Figure A.6.1 (continued): Thesis Presentation Process

FINDINGS



5

Figure A.6.1 (continued): Thesis Presentation Process

Conclusion

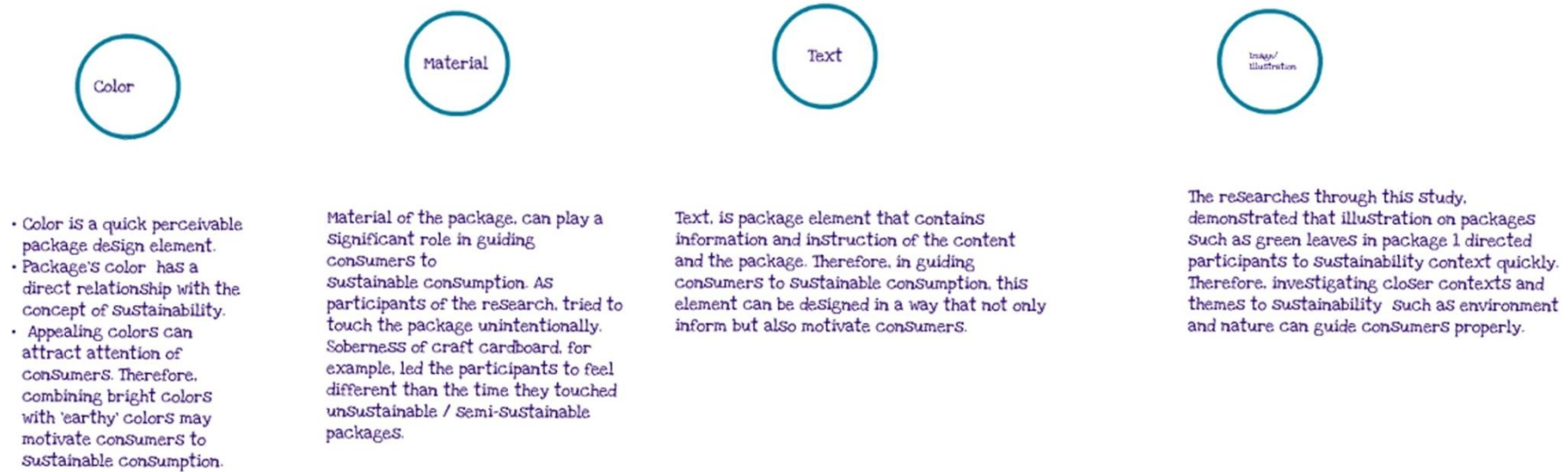


Figure A.6.1 (continued): Thesis Presentation Process

CURRICULUM VITAE



Name Surname: Haleh Barmaki
Place and Date of Birth: Iran- 21/05/1985
Address: Tehran- Queytariyeh
E-Mail: haleh85@gmail.com
B.Sc.: Middle East Technical University – Industrial Design

List of Publications and Patents:

Spring 2011 Patent for concept mobile phone ‘Nokia Slice’
Nokia Company – Helsinki, Finland