First momentary unboxing experience with aesthetic interaction

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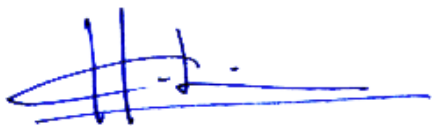

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ABSTRACT

There is a popular trend of online videos called unboxing: people are documenting the process of unpacking product packaging with commenting what they feel and think. Catching up with the trend, designers and practitioners in companies have struggled to improve packaging design, especially concerning unboxing experiences. Unboxing is spotlighted in a sense that it plays a role in making the first impression upon product as well as intensive emotion is aroused at the moment. When it comes to packaging design, most of the previous studies have focused on examining the visual elements for eye-catching packaging in the purchase stage, but there is little research on testing packaging design regarding unboxing interaction.

Under the notion, this study aims to address the possibility of unboxing interaction as a significant factor influencing user emotional experience and first impression for the product under the two research questions: 1) How unboxing with aesthetic interaction will affect to user emotional experience? 2) How unboxing with aesthetic interaction will influence the appraisal of product first impression? Research-through-design approach was adopted to prototype experiment stimuli under the control of packaging elements. The concept of aesthetic interaction and three factors were applied as design criteria for making three packaging types: freedom of interaction (Type A), interaction pattern (Type B) and richness of motor actions (Type C). The three types of packaging were developed, and 45 participants were asked to unbox them in random order and respond 14 emotions through PrEmo, a self-report emotion measuring tool. Then, they were requested to appraise the impression of product with 29 bipolar semantic differentials (SD) scales and tell overall impression of unboxing. This was followed by an interview in which the reasons why they thought like that were asked. Statistical analysis was utilized to compare the difference in emotional responses and SD between the prototypes. Descriptive and in vivo coding processes were used to analyze the unboxing experience in general.

As a result, the emotions of ‘joy’ and ‘fascination’ were aroused by the unboxing activity itself, and the three packaging prototypes evoked different types of and intensity of emotions. Primarily, it was revealed that the types of interaction significantly influenced the negative emotion of 'dissatisfaction.' Also, the interaction type of unboxing packaging was shown to influence the participants' appraisal of the packaged particular product's semantics significantly. Product type and interaction metaphor were associated with each packaging prototype, and the verbs describing unboxing activity varied between the package types. These findings are expected to provide design practitioners with a design guideline for packaging design and furthermore, to contribute to intentionally design emotional experience and first impression via unboxing packaging. Limitations and recommendations to a further study are discussed at the end.

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1. Introduction

1.1 Background

There is a popular trend of online videos related to product experience: people are documenting the process of unpacking product packaging with commenting what they feel and think, called unboxing. It is easy to find those videos when googling with keywords such as ‘unpacking’ ‘unboxing’ and ‘opening product.' This phenomenon is quite interesting, but at the same time, it is mysterious in a sense that it is not clear why those videos have been popular. Most of the videos rarely contain practical information such as what functions the product in a video has or how it operates. Instead, what a person focuses on in the video is just show product packaging itself and what he/she does is only unravel layers of the packaging one by one, literally doing just ‘unboxing’. What a ridiculous part of this phenomenon is millions of people have watched those videos every year, and its popularity has no sign of cooling down. It is easy to find power bloggers who expertly deal with unboxing contents and upload new unboxing videos regularly, and there are also many subscribers who follow those bloggers. It indicates that there is something that touches people’s desire at the moment of unboxing (Figure 1).

Figure 1_An example of documenting of unboxing process of product packaging (PHONEARENA,2014)

According to a recent survey from Dotcom Distribution, “52 percent of consumers are likely to make repetitively purchases from an online merchant that delivers premium packaging”. Also, it said, “4 in 10 consumers would share an image of delivery via social media if it came in a unique, branded or gift-like package”. It indicates that the role of product packaging is not restricted to protecting the inside product, but stretches to the extent that it determines the image of the brand as well as influences the company’s profit. Therefore, many corporates recently have paid more and serious attention to package design. Especially, in the case of Apple, designers’ efforts and obsession on product package are already well known. They already hold many patents related to package design. Also, according to an article (Heisler, 2012), Apple has a special packaging room occupied by hundreds of package prototypes where they test and determine which box evokes the emotional responses. The article added, “For Apple, packaging is more than how a product is nestled comfortably inside a box. Consequently, the user experience is not solely relegated to the device itself, but begins when a consumer picks up the box itself.”

So far, packaging design has concentrated on visual or graphic elements to attract customers in a way to affect their purchase decision. Product packaging these days, however, tends to focus on sustainability, usability and affordance, and also on the creation of new value to enhance their brand value. One possible way to create value is understanding and improving the moment of unboxing which plays a role as pass-through door, with marking a beginning of using a product.

Newly getting one, people recall prior experiences of unpacking product packages and usually get somewhat animated with the heart a little bounded with expectations. The activity of unboxing was depicted as “performing the ritual of free product for first use” arousing strong emotion (Dazarola, Torán, & Sendra, 2012). The fact that we have just got a new product would be the main contributing factor to evoke strong emotion. Or, the process of unveiling the packaging would be a fun or exciting experience itself. Considering the high level of emotion is associated with this opening phase in product life-cycle, the phase has the potential to provide positive and intense emotion to a user (P Desmet, Porcelijn, & Van Dijk, 2007).

Taking the circumstance into consideration, it is obvious unboxing phenomenon is not a bizarre behavior but a thought-provoking issue in user experience (UX) field: what is associated with unboxing experience and how can designers enhance the unboxing experience? The moment of opening a packaging is a very critical point since it is the starting point of product use as well as it is very emotional-bonded. However, it has hardly been explored the influence of unboxing to emotional experience and the significance of unboxing packaging to the product experience.

1.2 Research aims and objectives

This paper aims to discuss the possibility of unboxing experience as a significant moment of user emotional experience and product appraisal. Under this goal, the study offers new knowledge and useful information for design practitioners who want to deliver an impressive emotional experience and enhance brand image through packaging design. Therefore, the goals of this research are to 1) create product packaging for impressive unboxing experience, 2) look at what type of aesthetic interaction in unboxing will relate to particular types of emotions during unboxing packaging, and furthermore 3) explore how product packaging with enhanced “Interaction” aspect will influence to the product first impression appraisal.

1.3 Research questions

To achieve the objectives of the study, two main research questions, and three background research questions are formulated. The main questions are:

- How do unboxing with aesthetic interaction influence user emotional experience?
- How do unboxing with aesthetic interaction affect the appraisal of product first impression?

The background research questions are as below:

- What is unboxing experience?
- What is emotional experience?
- What is aesthetic interaction?

1.4 Research Design

In this thesis, the research-through-design approach was applied. The definition of research through design is “gaining knowledge through the process of designing, building and testing highly experimental prototype (Frens, 2006).” Briefly, research-through-design encourages the design activity in the process of examining or figuring out an effect or influence of design stimuli that are articulated following researcher's intention and control. A research-through-design approach is adopted to both control elements of product packaging, compare, and contrast the reaction to each packaging to answer the research questions. Three product packages were designed as experiment stimuli, and these were based on design guideline with other factors controlled.

1.5 Thesis outline

This master thesis is composed of the six chapters. All chapters are summarized as followed:

Chapter 1 gives outlines of the research background, research aims, research questions, and research design of the master thesis.

Chapter 2 introduces literature background of the related studies. It provides the definition of unboxing and implication of unboxing phenomenon and its significance in user experience(UX) perspectives. Also, emotional experience, elements of packaging design related to unboxing moment and the concept of aesthetic interaction will be introduced in the chapter.

Chapter 3 explains the research methods including the way of articulating the guideline of making prototypes, measurement of emotional responses, and product appraisal. The procedure of experiment and the detailed process of experiments such as dependent or independent variable, participants, stimuli and experiment environment are introduced.

Chapter 4 deals with analysis methods, results by conducting statistical analysis with graphic presentation of the emotional response and appraisal of product first impression.

Chapter 5 discusses the results of statistical analysis and overall discussion of research findings. It gives design implications that can inspire designers and practitioners. Limitation of the research is also addressed, and further studies that are recommended are followed.

Chapter 6 summarizes the thesis by re-addressing the research questions and reviewing the contribution.

2. Theoretical framework

2.1 Unboxing experience

Packaging can be theater; it can create a story.
You design a ritual of unpacking to make the product feel special.

– Jonathan Ive –

2.1.1 The Unboxing Phenomenon

An interesting phenomenon has been emerging on the internet for years: people are documenting the process of the opening product package, commenting their feeling and sharing it, which is called unboxing phenomenon. According to an article ("Unboxing | Know Your Meme," 2013), unboxing refers to "the practice of photographing or recording oneself while opening a new product out of its original packaging to showcase the contents as well as the recipient's first impression of the product". If googling keywords such as 'unpacking' 'unboxing' and 'opening product', a thousand of videos will come pouring. According to an estimation by Google YouTube insight (Google, n.d.), unboxing video views have grown 57% over the past year, and uploads have also grown more than 50% (Figure 2). It is a huge amount that seven years will be spent to watch all the videos on YouTube with "unboxing" in the title so far. Besides, it is predicted that interests toward "unboxing" will be getting higher over time, according to Google Trend (Figure 3) and it shows no sign of slowing down.

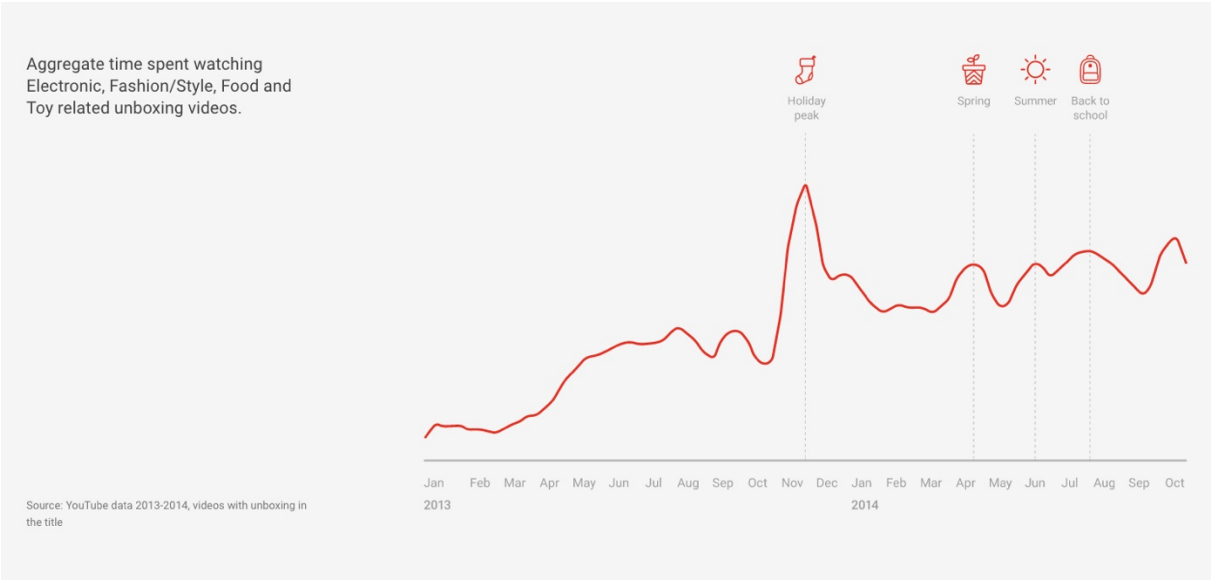


Figure 2_Aggregate time spent watching electronic, fashion/style, food, and toy related unboxing videos (source from YouTube)

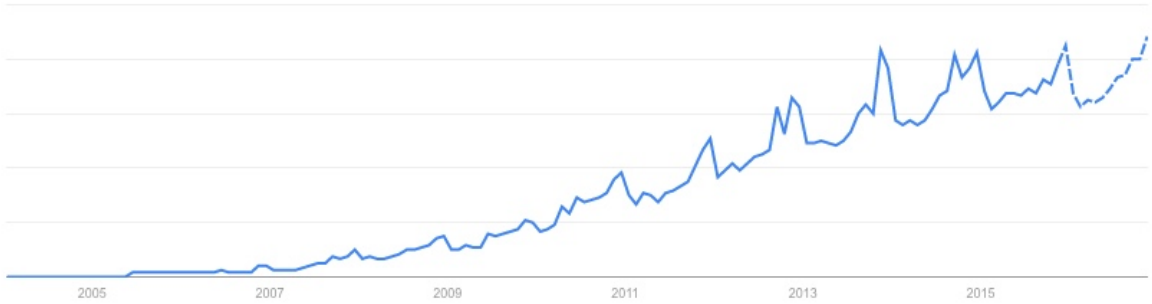


Figure 3_ The trend of googling "unboxing" over time

Not only huge is the amount of time spent on video the product category unboxing video covers is also diverse; an article of Vogue magazine (Alex, 2014), one of the top international magazines, introduced eight popular genres of unboxing: kid's toys, food, extreme unboxing, beauty, luxury, tech, and personalized gift packages. The unboxing videos cover almost all types of products, and it implies "unboxing" is a universal product experience; a majority of people are interested in, not particularly limited to certain types of product, consumer or context. Considering the fact millions of people have watched those videos, the unboxing seems very critical and promising point from design practice perspective.

Many online articles have shared opinions about unboxing phenomenon and figured out its implication. The following (Table 1) summarizes several articles with the categories such as functions, effects, why people like and its implication.

Table 1_Summary of online articles about unboxing

Reference	Functions	Effects	Why people like	Implication
Think with Google	"It dramatizes product and, in turn, take on a quirky, playful spirit, showcasing products in all of their freshly unopened glory."	"Unboxing videos elicit emotional feeling" "It visualizes the product people are going to buy"	"It taps into the child-like anticipation we all feel for something shiny and new" "It gives consumers a look into what exactly they can expect when they get a product off the shelf and into their hands"	"Unboxing videos can help marketers build anticipation while providing useful product information"
Richard Lazarrera (2015)	"To provide additional value for your customer as well as your business through the ability to create a memorable and sharable experience."	"Creating a memorable experience that leaves your customers delighted with an experience"		
The Unboxing Phenomenon: Packaging gone viral	"The product is more visible, or adjust the graphics so what's inside is more obvious."	"That first moment of the video when you see the custom box with its turned edges intact, its tuck tabs still tucked, that's when it's the most appealing"	-	-

Jesse Rechardson (2015)	"Compelling product choices" "Cohesive branding" "Creating a visceral experience"		-	-
Roger Rooley (2014)		"It makes a great first impression, which raises expectations for the product inside"	-	"Packaging should, for a fashion product, communicate a sense of value and, perhaps, prestige"
Lucie Merieux (2015)	"The unboxing experience is a direct way to link customers to brand"		"People are getting addicted to those kind of experiences, giving them what they are expecting or even more will increase this excitement and they'll post videos about your products."	"Improving your packaging will make products more enjoyable, and people will be more willing to unbox them rather than just unwrap them as they usually do." "Taking a little time to create a well-designed packaging will help you to reach new customers and extend your business as well as to retain your existing customers"

A common idea about unboxing is that the moment of unboxing is critical since it provokes emotion and raises certain expectations to inside products (Google, n.d.; Pantin-Sohier, 2009). As it determines the first impression of product(Merieux, 2015; Roger, 2014), companies and designers are recommended to utilize effectively this moment for creating an impressive and memorable experience (Google, n.d.; Merieux, 2015; Roger, 2014). It can leave pleasurable experience as well as links to the brand experience. Therefore, improving and well-designed packaging will make products more understandable, deliver a joyful experience to users, and contribute to leave positive brand image in users' mind (Google, n.d.; Merieux, 2015).

2.1.2 Out of the box experience (OOBE)

According to the basic model of the integration of Instances and Events of Product-Person Interaction (IEPPI) (Dazarola, Torán, & Sendra, 2012), the universal user experience is composed of six phases in chronological order: Pre-Acquisition, Pre-usage, Usage, No-usage, Conversation and Retirement (Table 2). People are firstly aware of a product and visually contact it (Pre-acquisition). After purchasing it, the product is transported to the home by all means, and then, the product packaging is unpacked and installed for first use (Pre-usage). People use the product in earnest, and it is continued to be maintained, stored, malfunctioned, or repaired (Usage, No-Usage, Conversation). People repeat it between in use and no usage phase and finally the product is disposed of when it breaks down, or users feel bored and buy a new one (Retirement).

Table 2_Basic model of the integration of Instances and Events of Product-Person Interaction (IEPPI) (Dazarola et al., 2012)

Instances	Events	Definition	Description and features	Examples
Pre-acquisition	Initial cognitive contacts	Awareness of the existence of product, and development of product-related thoughts	Creating expectations about the experience of using a product or its features and benefits	Fantasizing about the new mobile phone, to be its owner, its appearance and performance

	First looks	User-product visual contact, by direct vision or through on paper or virtual catalogs	First, and usually the only interaction with the aesthetic properties of the product prior to purchase	Visual appeal for a mobile phone model from the existing models range
	First contacts/ try out	Physical access to the product at sales point, exploration and manipulation	Occasional chance to physically interact with the product and try some of their functions before the acquisition	Ask the seller to try a product (laptops, pillows, etc.) physically to make the buying decision
Pre-usage	Transport	Moving the product from the point of acquisition to the place of first use	The packaged product is transported before beginning regular use	Transfer of the packaged product from the store to the user's home
	Unpacking	Opening the product package	Moment of great emotional intensity for the user, who performs the ritual of "free" product for first use	Opening the case of an appliance, removal of their guards, perceiving at once its textures, aromas, weight, quality, etc.
	Installation and /or First start	Enabling product features, installation, preparation, assembly, and first use	Key event for the user experience, the product is assembled, connected and installed to run for the first time	Installation of a "ready to assemble" table, connect the cables and turning on a TV for the first time.
Usage	Main Interactions	Using the product and its primary functions	The product performs the main functions for which it was created and interacts with the user in various ways	Use the product, clean with a vacuum, cut with a knife, etc.
No-usage	Cognitive interactions	Development of thoughts related to the specific product that is already owned by the user	The user interacts with the product idea which already owns, recalling its functions, user experience, etc.	Remember the experience of using a product and prepare for re-use and experience their benefits and sensations
	Rest	Short period of time where the product does not perform its primary functions, but remains available for quick use	The product rests momentarily, the user turns it off or leave it for a while	Fold a mobile phone or a laptop, turn off a lamp.
	Storage	Longer period in which the product is stored and is not used for a while.	The product rests for an extended period, usually out of sight. Sometimes used as a resource to facilitate dispossession	Save a heater in the original packaging with the arrival of summer
	Relocation/ repositioning	Moment in which the product is moved or manipulated to facilitate or allow its use	In this event the product is grasped, manipulated, slid or rolled to different places to carry out its range of active functions	Move a cleaner from room to room, reposition the sofa
Conversation	Cleaning	Product cleaning by user, deep (interior) or shallow (surfaces)	Removal of dust and dirt, superficial or internally	Clear a table using a cloth and furniture polish, wash a car, etc.
	Maintenance	Event in which the product is subject to simple repairs or replacements of parts	Replacement parts or components, application of lubricants, set of parts, etc. with little technical difficulty	Change a light bulb, lubricate a bicycle, and so on.
Retirement	Pre-dispossession	Process of emotional and/or physical detachment from the product	Users are not separated from a product immediately, previously become detached from the product, physical and often emotionally	Keep a clock in a drawer, providing an old laptop without a defined period of repayment.
	Separation	Time of user-product final and physical separation	The product is thrown away, left for collection, sold, reused, or recycled	Throw a chair, bring a ink cartridge to recycling center, selling a old cell phone to a new user

	Post-dispossession	Cognitive relationship with a product which does not exist anymore contact	The user remember the product that once possessed, reminds the user experience and feel satisfied, longing, etc.	Remember the first car and the experiences with the product

Among all stages, the events at pre-usage such as transporting, unpacking(unboxing) and installation stage have distinctive characteristics in comparison with the other events:

- **One-time event**: It happens only one time, which users would not repeat it during product use cycle. For example, once a person unpacks packaging, it will be the first and last event that never happens again during the rest of product life cycle.

- **Short-term event**: transporting, unpacking and installation are relatively short experience compared to other events. In case of pre-usage phase of smartphone, for instance, usage period would be approximately more than one or two years while unboxing or installation would take less than 5 minutes.

Due to such distinctive characteristics, experience occurring at pre-stage has become typological, called Out of the Box experience (OOBE). OOBE is defined as is "the initial experience a user has in taking a new product out of the box and ready to set it up, in preparation for use (Ketola, 2005)". Cathy (2014) defined OOBE in product lifecycle (Figure 4) and addressed OOBE plays a significant role in differentiating products, enhancing the brand image and providing supportive information about the product.

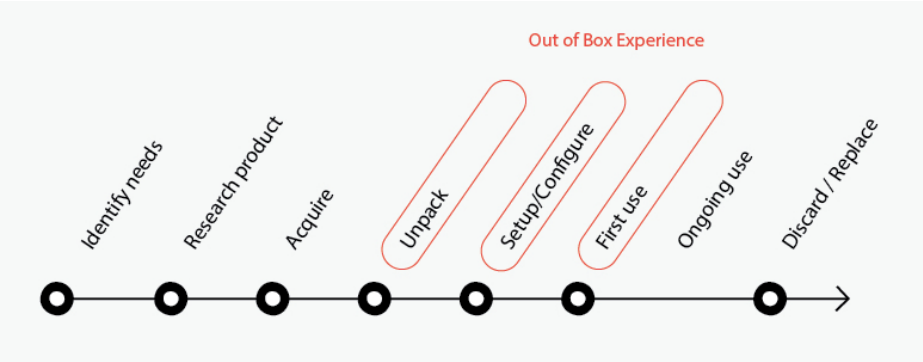


Figure 4_Out of the Box Experience (OOBE) and the Product Lifecycle (Cathy, 2014)

At the 'pre-usage' stage, i.e., the moment of OOBE, three main events are occurring concerning interaction: a visual appraisal of product representations, visual appraisal of a physical product, and multisensory appraisal of a product (Figure 5) (Wang & Mu-Chien, 2011).

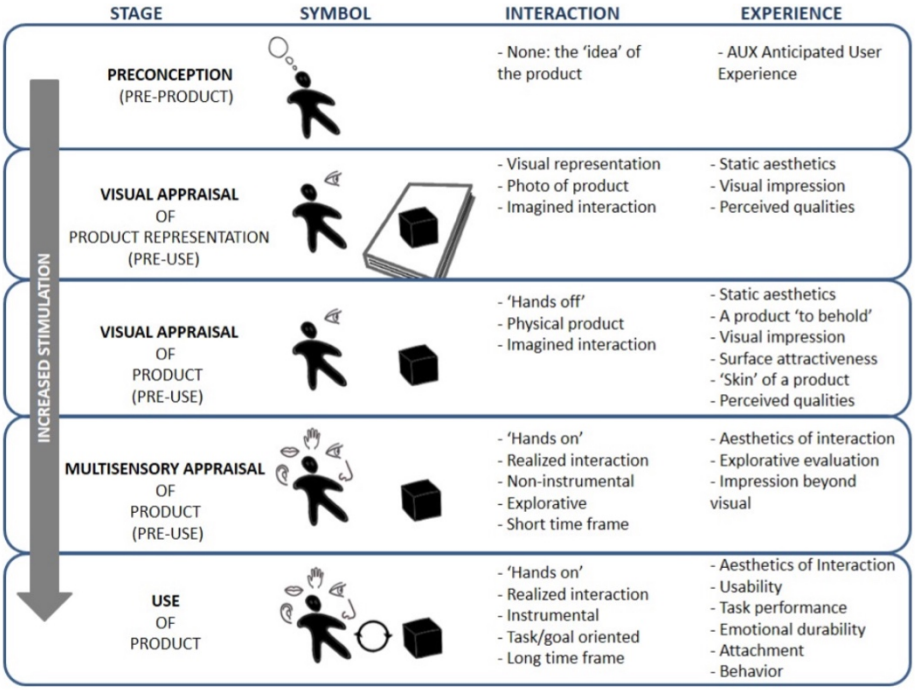


Figure 5_Progression of user-product interaction and experience alongside increased sensorial stimulation (Wang & Mu-chien,2011)

In multisensory appraisal at the pre-use stages, people experience a short-term interaction featured with such as 'hands on', 'non-instrumental', 'realized', and 'explorative' interaction. While interacting with product in various channels, people unconsciously think about the product. Also they get an impression that can influence the general appraisal of a product. As a gateway before using the product, the unboxing event would be significant where various interactions are accompanied at the same time such as visual impression (visual appraisal of product representation) and surface attractiveness (visual appraisal of product). The first impression has a lot of potential to greatly influence the overall evaluation of product because users show a tendency that they do not remember all specific events and details of previous experience (Norman, 2009). But the impressive memory can remain for a long time. In other words, general product evaluation would be formed by several episodic events rather than accumulations of usage memory. Concerning the fact, unboxing is an important event. Under the notion of its significance, companies have been trying to deliver a more improved initial experience (Fouts, 2000). It leads design practitioners to focus on improving product packaging regarding graphic as well as structure. Nevertheless, few studies related to OOBE of products have been conducted (Ketola, 2005).

2.2 Emotional experience of unboxing

A strong emotion,
especially if experienced for the first time,
leaves a vivid memory of the scene where it occurred.

– Algernon Blackwood –

2.2.1 Emotional experience

People feel a certain kind of emotion (e.g. love or anger) from the interaction between him/her and an object. Such experience is defined as emotional experience. It is one of the main categories of product experience suggested by Desmet (2007). He defined product experience as "the entire set of affects that is elicited by the interaction between a user and a product, including the degree to which all our senses are gratified (aesthetic experience), the meanings we attach to the product (experience of meaning) and the feelings and emotions that are elicited (emotional experience) following Hekkert's definition (2006, p. 106)".

Emotional experience is one of significant topics among such various types and factors in user experience. Human being's feelings and emotional responses to certain stimuli are related to survival instinct and need (Arnold, 1960): people have an instinctive taste for something that is safe and beneficial and horror of something that threatens life. That is, a positive and affective response will be obtained to beneficial artifacts while negative or unpleasant emotion will be pulled by a dangerous or maleficent situation (Desmet, 2002). In perspective of product experience, emotions affect not only to rationality about what to buy but also to consumer satisfaction, product attachment, general well-being (Desmet & Schifferstein, 2012).
The communication of positive emotions can be induced by product attributes, and it could be the "meaning" aspect of product which allows to communicate with users at an emotional level (Demirbilek & Sener, 2003). However, it is not sufficient for designers only to rely on their intuition and personal sensitivities in order to design a better product eliciting positive emotions. What they are required first is to understand the emotional responses of the target consumer, knowing that these may be different from their own (Desmet & Schifferstein, 2012).

Despite the fact that user emotional experience 's hard to figure out, it has been more spotlighted than basic usability (Kujala, Roto, Väänänen-Vainio-Mattila, Karapanos, & Sinnelä, 2011). The focus on human-product interaction also has shifted from user's behavior and cognition to user's visceral experience (Desmet & Hekkert, 2007). Emotional and socio-cultural functions of a product have been emerging as an important factor that designers should take into consideration beyond fulfilling the functional requirements of the product.

2.2.2 Unboxing as emotion lever

Dazalola (2012) described 'unboxing' as a critical moment evoking strong emotion when a person unboxes packaging and is about to use the product for the first time. He emphasized the importance of the event with saying "it is particularly intense regarding the emotions aroused in consumers." Seeing unboxing as a "ritual" rather than a normal event, he urged designers to create "controlled experience" that makes people feel certain emotions. It implies that the moment of unboxing can be intentionally controlled and designed to arouse a particular emotion to users.

There is another study claiming that the role of product packaging is for eliciting emotional response. Patrick (2014) quoted in his article of Filip Weymans, director of marketing for labels and packaging at Xeikon, "triggering personalized emotional response has become as important a function for packaging as conveying information about the product." He predicted "the coming of an age of emotion in which brand owners and their service providers will find new ways to use packages and labels as emotional levers." Liao (2012) testified whether packaging could arouse emotional response and measured it with three different type of tools : skin conductance, facial electromyography (EMG) and self- assessment scales. The results showed it is possible for packaging itself to provoke emotions with different elements of packaging. Obviously, emotional experience via unboxing packaging has been spotlighted as a path to enhance people perception of product or brand identity. Improving product opening phases with new and creative way of unboxing packaging is important to deliver pleasurable and unforgettable experience to user rather than designing a product itself.

2.3 Aesthetic interaction in product packaging

...if it is not beautiful,
it probably shouldn't be at all.

– Yves Béhar –

2.3.1 Packaging elements for unboxing

It is evident that packaging plays a significant role for products. Most of all, the main function of packaging is protecting the inside product to keep it in good condition until it reaches a customer. Beyond the main function, there are several critical roles that packaging takes. It provides customers with product information such as product category (Ampuero & Vila, 2006), details of product features and brand value (Bloch, 1995). Also, packaging has significant influence to customer's attention and perception about the product (Creusen & Schoormans, 2005). Especially, Clement (2007) found out in his experiment that visual aspect of packaging design greatly influenced purchase decision process.

Under the notion, many companies and designers has put their effort to create eye-catching packaging to get more consumer's attention and attraction. It is now very well known that marketing and advertising area have been interested in developing better ways to emphasize product feature and make their product more noticeable by using packaging. Rundh (2009) explored how packaging design can help achieve competitiveness in the marketing perspective. Similarly, design practitioners are required to create novel, original and creative packaging to differentiate the product from competitors.

Most of previous the studies, therefore, investigated the relationship of consumers' perception and packaging graphic elements such as color, shape, size, and image on the surface (Table 3). For example, Westerman (2013) explored the influence of shape, orientation and alignment of graphic designs to consumers' preference and purchase likelihood. Ares (2010) manipulated six images of milk packages with color and shape variation and tested its influence on consumer's evaluation. Similarly, Becker (2011) conducted a study examining how the form and color of packaging would

influence taste impression in yogurt packaging through manipulating color saturation and shape curve. Smet & Overbeeke (1995) found whether packaging the shape and color of packaging could give consumers product information. They conducted the experiment by measuring the correspondences between the dessert and package designs. On the other hand, it was figured out that image schemas of graphic design in packaging can influence general product impression (Te Vaarwerk, Van Rompay, & Okken, 2015).

Table 3_Framework for packaging

Package design	Liking for package	Communication through package	Usability of package
Attractive of buyer	Brand	Color	Ease of handling
Communication to the buyer	Country of origin	Symbols / logo	Disposability
Convenience in handling and using	Color connotation	Information about product	Moisture protection
Sale-ability of product	Symbol of connotation	Brand image	Protection from ultraviolet radiation
	Size	Shape	
Green aspect	-	Size	

Like this, the above studies were conducted to testify the effectiveness of package elements to draw good consumers' reaction. However, those studies have the limitation that they only considered its influence in the purchasing stage. In other words, the foci of the studies were on mostly graphic elements, and only marketing perspective was considered. When looking at product package use in product life cycle (Figure 6), people communicate with the package in the seven steps such as carrying, storing, opening, dispensing, closing and disposing of packaging. Since product packaging is associated with many aspects, general experience has to be considered (Te Vaarwerk et al., 2015).

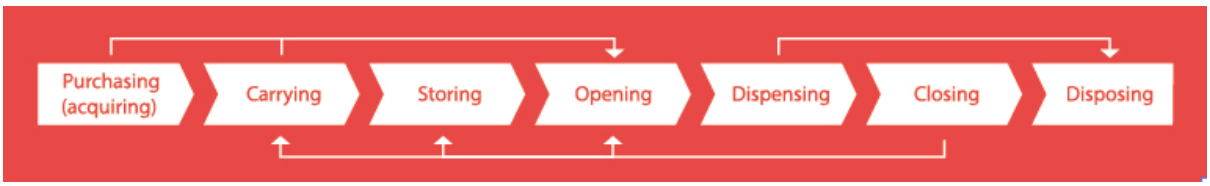


Figure 6_Generic package use life cycle

In some studies, it was regarded that designing packaging is more than just making things look better. Beyond just visual pleasure, design practitioners have considered product packaging as "deliverer of brand image". Pantin-Sohier (2009) said, "Packaging is the first vehicle for identification, recognition and distinction of the brand and the product in a consumption goods market which is more and more crowded." Underwood (2002) figured out that the image on the package provided brand identity and

could change brand identity and belief. He said, “consumers use packaging, an extrinsic cue, to infer intrinsic product attributes.” It indicates that packaging induces more profound influence on people perception of product attributes and brand.

When it comes to brand identity and package, Apple is one of the most popular cases who has been strengthening the company's brand value through packaging design. Not only visual pleasure, have they controlled the whole experience of packaging from purchase to disposing the packaging. It seems that Apple has standardized their packaging design to keep consistency of brand identity and created differentiated impressions. It contributes Apple to look different and distinguishable from competitors.

What makes Apple packaging different and extraordinary? Prominent interaction at the unboxing packaging moment can be a reason for that. Needless to say the popularity of Apple products, the distinction of the unboxing way of Apple products is well known. In the case of Apple package, it arouses more intense emotions compared to other packages. Also the unboxing videos of Apple products have also become the topic of conversation whenever a new product is introduced. It is pretty common that people showed ‘WOW reactions’ while they unboxed Apple packaging in the videos. ‘Wow experience’ refers ‘positive user experience’, and it has been regarded as a critical design target (Väänänen-Vainio-Mattila, Palviainen, Pakarinen, Lagerstam, & Kangas, 2011). What is called ‘design for wow’ has much to do with emotions. According to Desmet & Hekkert (2007), the opening phase of product life cycle is the moment providing ‘WOW experience’ combined with emotion such as fascination, pleasant, surprise and desire when people are associated with high level of emotion. At this point, a question is raised up: what induces emotions and leads people to feel positive at the moment of unboxing? There is a lack of studies that examined packaging design regarding interaction at the unboxing time.

2.3.2 Aesthetic interaction in unboxing packaging

What arouses a feeling or emotion for the first time is an aesthetic aspect of product: people are more attracted by aesthetical and good-looking artifacts giving pleasant emotion and positive experience. Actually, it is human beings’ nature to survive. Aesthetic is accompanied by both cognitive and emotional aspect, and aesthetic judgment and emotions are closely connected with each other (Kant, 1790). An empirical study conducted by Hartmana (2006) stated the significance of aesthetics with regard to its halo effect; judgment of aesthetics would influence to general evaluation of usability, content, and overall preference. In other words, aesthetic judgment is so influential that could offset usability, or functional problems that a product or a system has.

When it comes to aesthetic, Desmet (2007) defined *aesthetic experience* in a previous study that indicates a product’s feature to satisfy our sensory modalities. Looking into definitions of aesthetic

experience in more detail, Marković (2012) said, “Aesthetic situations and objects of aesthetic interest are specified as fundamentally different from everyday situations and objects of everyday use”. When it comes to unusual experience from ordinary, unboxing packaging itself has huge potential for creating new and aesthetic experience in as sense it is an unusual event (not frequently happens) that people consider it special. The focus of the aesthetics is mostly on visual appearance the design process, and making it more attractive and pleasurable(Locher, Overbeeke, & Wensveen, 2010). However, there has been attempts to extend the concept of aesthetics as “feels good” not just “looks good”, and it includes interaction between users and artifact (Wan Hashim, Md Noor, & Wan Adnan, 2009). Rampino (2011) defined *Aesthetic* as an added value to an artifact. The concept of aesthetic as an ‘added value’ is pretty comprehensive, and it has been called aesthetic experience.

Interests of aesthetic aspects in the design of interactive systems have been growing (Petersen, Iversen, & Krogh, 2004). Interaction designers have struggled with embodying senses and leading positive response in the interactive system (Tractinsky, 2005). It is called aesthetic interaction. The term of ‘aesthetic interaction’ is so vague since ‘aesthetic’ was usually used to describe visual appraisal of product, so it is hard to apply the concept to interaction directly. Locher (2010) defined aesthetic interaction as the aesthetics of interactive systems, which implies that aesthetics is tightly connected to context, use, and instrumentality, as an attempt to distinguish visual aspects from aesthetic interaction,. In addition, the term “interaction aesthetics” was referred to “the qualities of a design that lead to the feelings, emotions, and behaviors that result from these types of interactions” (Eden, 2010). The aesthetics of interaction emphasizes the fact that aesthetic is not intrinsically existing as an aspect of an artifact, but to the way people experience it (Lim, Stolterman, Jung, & Donaldson, 2007).

There were also many attempts to figure out aesthetic interaction and its attributes. Locher (2010) defined aesthetic interaction as the dynamic, ongoing interaction between these two components of the system. Ross (2010) introduced four principles composed of aesthetic interaction; aesthetic interaction should “(1) have practical use next to intrinsic value, (2) have social and ethical dimensions, (3) have satisfying dynamic form, and (4) actively involve people's bodily, cognitive, emotional and social skills.” Similarly, Udsen (2005) addressed four approaches to obtain aesthetic interaction such as the cultural, the functionalistic, the experience-based and the techno-futuristic in HCI perspective. Mahlke (2002) introduced four aspects of aesthetic interaction for interaction in website usages such as the perceived usefulness, ease of use, hedonic quality, and visual attractiveness. Desmet (2008) suggested five elements that can be considered for interaction dimensions, and they were force, sound, motion, texture, and performance apart from the visual aspect. Frens (2004) mentioned, “as aesthetic experience progresses, the artifact presents continually

changing, action-driven affordances." Among several definition of aesthetic interaction, I adopted the concept of "action-driven affordances" in the current study, since the opening packaging is closely related to user action and behavior requiring people's motor and cognitive skills. Action-driven affordance for aesthetic interaction refers to the linking between appearance and action, and it can provide "meaning" to a product (Djajadiningrat et al., 2004)

The study suggested three possible factors of aesthetic interaction that can give a lot of opportunities to obtain differentiation in both appearance and action possibilities (Table 4). It said, "physical objects open up new avenues to meaning and aesthetics in interaction design (Djajadiningrat et al., 2004)." Below are detailed descriptions of each factor.

Table 4_Factors that play a role in aesthetics in interaction (Djajadiningrat et al., 2004)

Factors	Description	Description
Freedom of interaction	Interaction that has a variety of orders and combinations of actions, not single path of interaction way	The product allows for such expressive behavior—not constraining the user
Interaction pattern	Interaction pattern that spins out between the user and product	The timing, flow and rhythm, liking user actions and product reaction
Richness of motor actions	Interaction that encourages people wide range of motor skill	Design by number. A fair amount of room to man oeuvre between the actions required by those objects

1. ***Freedom of interaction***: It implies that a user can express herself in the interaction rather than following fixed order or a single path. It is the way not constraining the user to be tied up but allowing to express himself or herself. He described it as "not forcing the user into a straight interaction jacket allows the feel of the interaction to stay fresh".

2. ***Interaction pattern****:* It draws out between user and product. The timing, flow, and rhythm that correspond to user action and product reaction have considerable influence the feel of aesthetic interaction.

3. ***Richness of motor actions****:* It can be explained as "design by number". Operating or manipulating an object requires interaction between users and product so the way a product encourages human motor skills can be an aesthetic interplay.

According to Rampino's definition of *Aesthetic* (2011) - an added value to an artifact, this study adopted the concept of 'aesthetic' into packaging design in order to promote a value in unboxing experience through 'aesthetic interaction'. This study aims to examine how the interaction of unboxing influences user emotional experience and the appraisal of the inside product in each product packaging, adopting the three factors for aesthetic interaction. If unboxing interaction plays a critical role in packaging design, it can help design practitioners to utilize the features of aesthetic interactions for delivering better product experience.

3. Methods

3.1 Experiment design

An experiment was designed with two main tasks in order to answer the two research questions: One is to obtain emotional responses after unboxing packaging, and the other is to evaluate the first impression of inner product via the experience of unboxing product packaging. In order to conduct the experiment, three packaging prototypes were embodied following the concept of aesthetic interaction; there are three factors of aesthetic interaction such as freedom of interaction. Interaction pattern and richness of motion actions. Three packaging adopting each factor were used as unboxing stimuli for obtaining the emotional response and first impression of a product. Below is a briefly summarized figure of experiment design of the current study (Figure 7).

Figure 7_Outline of experiment

3.2 Experiment Stimuli

3.2.1 Design guideline

For a research-through-design approach, the features of three types of aesthetic interaction were characterized. Controlled stimuli by unifying other packaging factors except the way of interaction were used to compare and contrast how different each stimulus would evoke particular emotional responses and influence to product first impression. In order to design guideline, operational definitions were formulated as design guidelines to embody prototypes for experiment stimuli by applying characteristics of aesthetic interaction. For defining design guidelines, three senior students whose majors were industrial design participated in a discussion session. First of all, they were investigated existing packaging types to understand various ways of the unboxing of existing packaging. Next, the operational definitions of the three types of aesthetic interaction were made based on their characteristics as follow:

- **Freedom of interaction:** Freedom of interaction that occurs in an infinite way that does not follow a fixed order or sequence.

- **Interaction pattern:** The coincidence of movement between user's action and the reaction to the package. When unboxing a product package, user's action and reaction of packaging are naturally coupled in terms of timing and flow.

- **Richness of motor actions**: Interaction composed of series of sequential procedure following a number of tasks that require user's cognitive skill.

Based on the operational definitions, many ideas of each packaging were generated. Ideas of 'Freedom of interaction' (coded Type A) were created to focus on a multi-way of taking the product out of the packaging without providing clear affordance. In the case of 'interaction pattern' (coded Type B), the key point of ideas was the correspondence between input (user action) and output (action of packaging) in terms of timing and movement. 'Richness of motor actions' (coded Type C) was characterized in a way to add a number of tasks of taking off layer by layer. The final concepts of each packaging were determined by unanimous consent.

3.2.2 The three packaging prototypes

According to the operational definitions of three different aspects of aesthetic interaction, three types of packaging were developed and prototyped: freedom of interaction (Type A), interaction pattern (Type B) and richness of motor action (Type C). In order to focus upon the structural components of product packaging design in the opening experience, design elements such as color, materials, surface printing and labeling were controlled. Since the size of packaging could result in a biased result, the same dimensions (140mm x 140mm x 120mm) were applied to all of the three designs. In addition to that, they were prototyped without the expression of color or labeling of any kind.

- **Type A (freedom of interaction)**

The primary concern while designing Type A packaging was how to realize the concept of ‘freedom’ as interaction. When it comes to typical box packaging, the number of layers or components is no more than two, which is very restricted and far from a free interaction. Therefore, it is inevitable to bring another material for Type A packaging in order to give a feeling of freedom while unboxing. When selecting a material, the fluidity of movement was supremely considered because it should not have limitation. Finally, Type A was filled with Styrofoam, which is widely used in product packaging as absorbing shock and protecting inside products (Figure 8). This was designed to encourage people to grab the product in various ways without any fixed order or sequence, following the operational definition of freedom of interaction.

Figure 8_A picture of packaging Type A applied ‘freedom of interaction’

- **Type B (interaction pattern)**

In the case of type B, the main design work focused on realizing coincidence of movement between user's action and the reaction of the package. According to the operational definition, the coincidence should be naturally coupled with timing and flow movement. Ordinary box packaging structure would not be suitable for the concept. Therefore, the design for Type B packaging started to make it have a different structure. Also, there should be an element triggering correspondent movement between user action and packaging reaction. As a solution, a string was added to the packaging (Figure 9). The function of the string is linking user action and movement of packaging. It was designed that if the string is pulled out, the inner box is supposed to rotate and the surface holding the inside product comes out. The string played as a mediator between user and packaging. If people pull the string fast, the inside box connected to the string also rotates fast. It followed the operational definition of 'interaction pattern' that the timing, flow, and rhythm of reaction is linking to user actions.

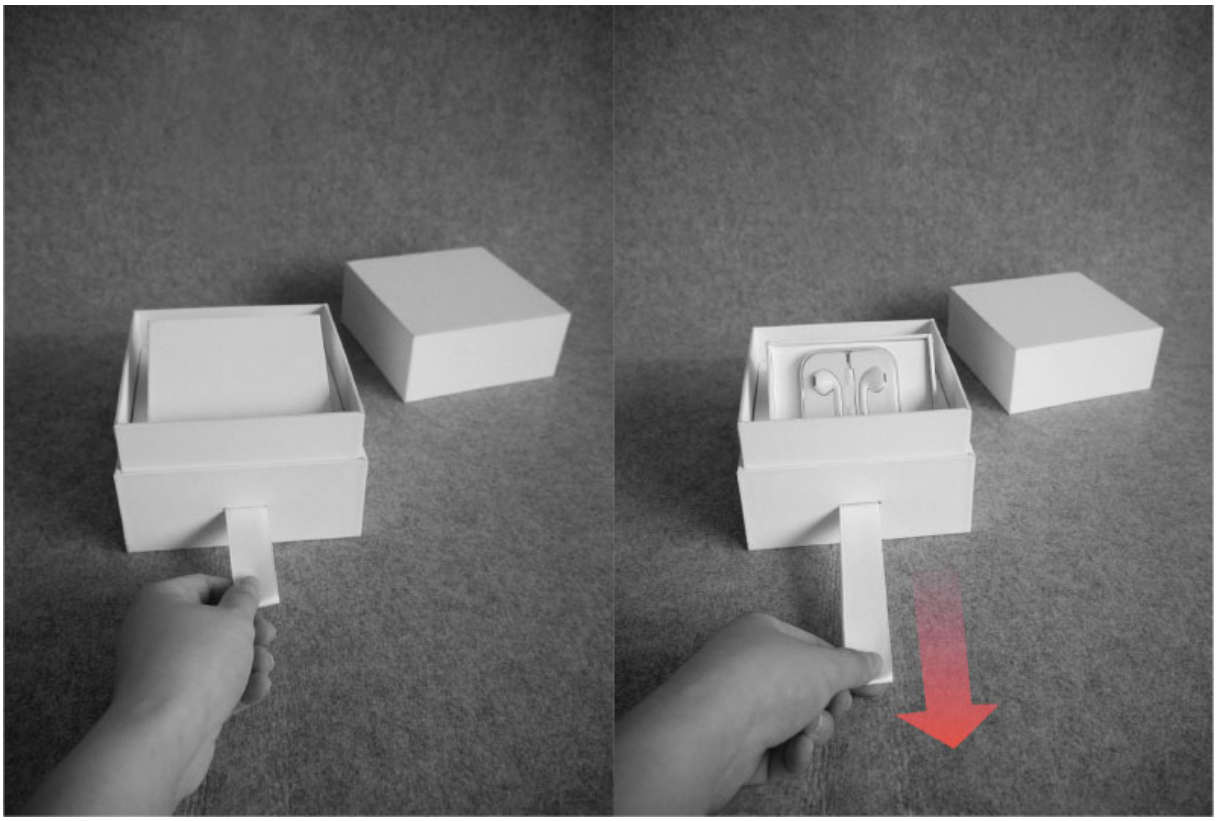


Figure 9_ A picture of packaging Type B applied 'interaction pattern'

- **Type C (richness of motor action)**

When designing packaging Type C, the way to encourage user motor action and cognitive skill were the most importantly considered. It is composed of several packaging elements that are accompanied by transforming tasks to take out the inside product (Figure 10). Unlike type A, this type consists of series of sequential procedure and it requires user's cognitive skills. The number of tasks was four and the way of taking out pieces was different respectively to encourage user cognitive skill rather than repeating same tasks; if same tasks had been given for unboxing, not only would it have evoked disturbing emotion but discouraged cognitive skill. The repetition of task is more likely to bore people rather than feel a sense of aesthetic. Considering the risks, all unboxing tasks were designed in variation. This design well followed the operational definition of 'richness of motor action' and its original concept of 'design by numbers.'

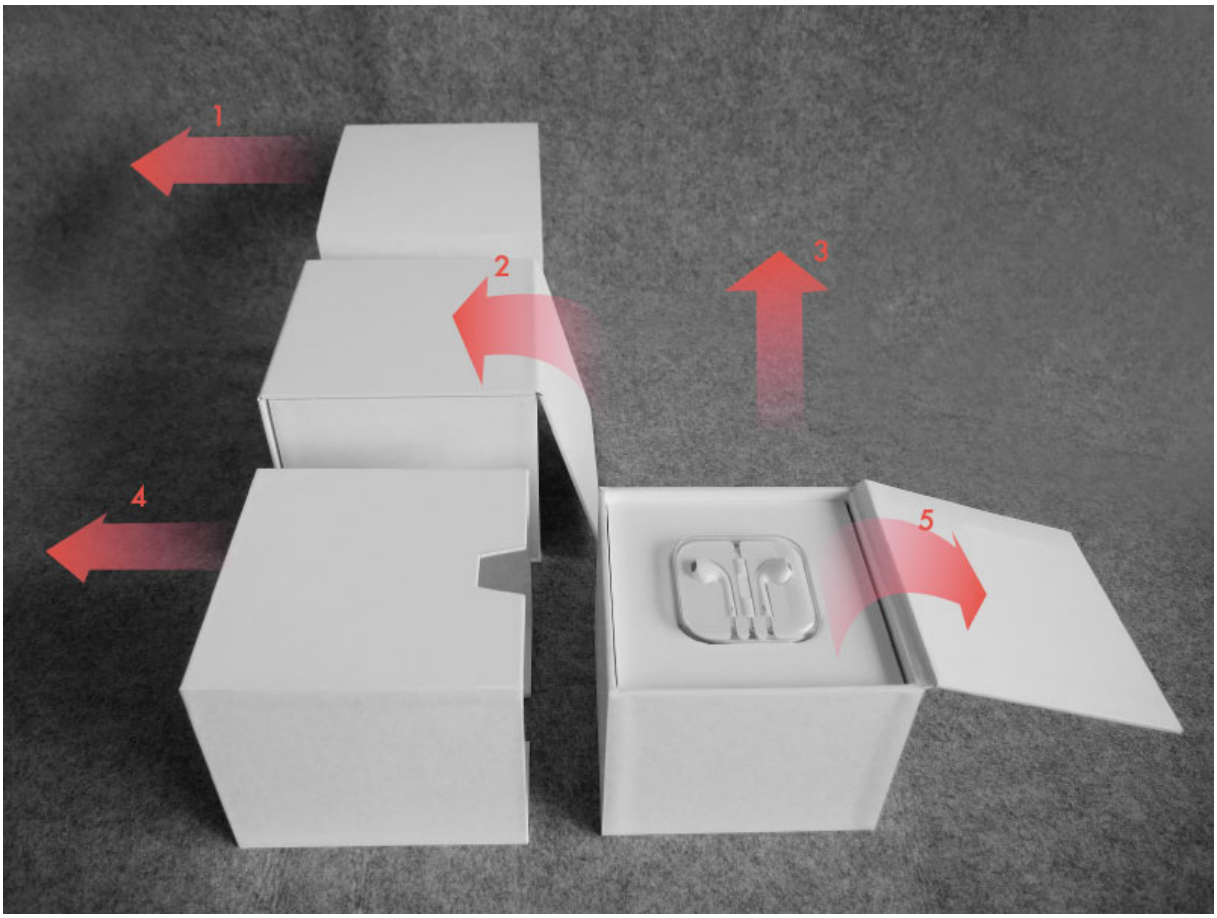


Figure 10_ A picture of packaging Type C applied 'richness of motor action'

3.2.3 Inside Product

Figure 11_Earphone: the inside product of each packaging prototype

The context was given that they had bought a new earphone, and they were just about to unpack the packaging for the first use, which made participants feel as if it were the real situation. Earphone was selected as the inside product of stimuli in a sense that it has 'neutral' characteristic; the form is typological, and it is widely used regardless of particular context, age, and gender (Figure 11). Also, the price of earphone covers wide ranges, which will not affect participants' responses by particular dominant brands and models.

3.3 Materials for measurement

3.3.1 Measuring emotional responses

The main goal of the experiment was to obtain user emotional response to the unboxing experience. PrEmo was adopted as an instrument for measuring emotional response, a self-report online instrument with a non-verbal animation (Desmet, 2005). There was a total of 14 animations described seven positive (i.e. desire, pleasant surprise, inspiration, amusement, admiration, satisfaction, fascination) and seven negative emotions aroused from products (fear, contempt, disgust, unpleasant, dissatisfaction, disappointment, and boredom). Figure 12 shows the measurement interface.

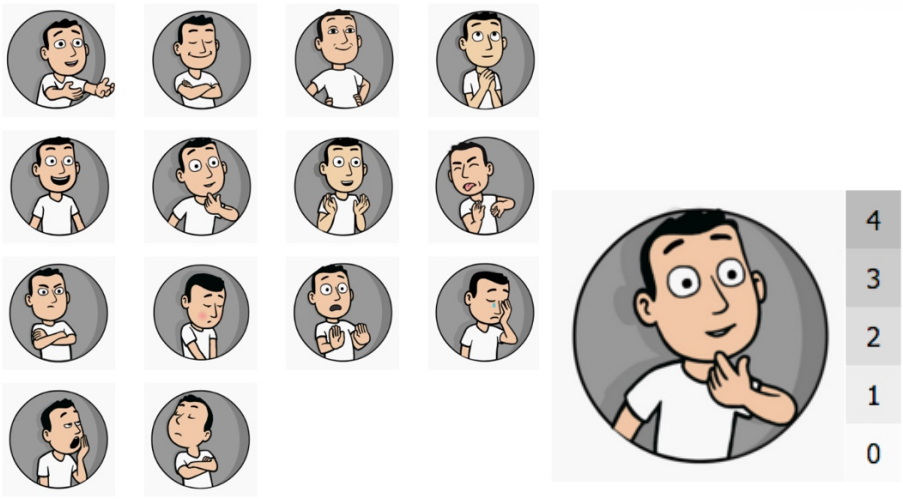


Figure 12_PrEmo interface

PrEmo is an intuitive tool that people can easily follow and express their emotion with a product. If clicking each puppet, the puppet on the picture is activated to express a particular emotion with voice and gesture. Then, the panel of five-point scales (ranging 0 to 4) appear on the right side of the character. What a participant has to do is just click one of the number on the panel according to the degree of correspondence of feeling: 0 – "I do not feel this", 1 – "I feel this a little", 2 – "I feel this somewhat", 3 – "I do feel this", and 4 – "I do feel this strongly". All 14 emotions were measured for each packaging respectively.

3.3.2 Measuring semantic differential scales

In order to measure the appraisal of product first impression via unboxing product packaging, product semantic differential scales (SD from here on) were chosen as a measuring construct for first impression onto a product. SD is a widely used method for evaluating product meaning and impression by bipolar adjectives, and it was used to compare responses of perception of product onto stimuli (Khalaj & Pedgley, 2014). There were four groups of 29 bipolar pairs of SD– social values and positions (SVP), usability and interaction (UI), qualities of form (QF) and personality characteristics (PC) (Table 5). In order to adequately measure it, an instrument was designed (Figure 13).

Table 5_A set of 29 prescriptive grouped bipolar adjective / phrase pairs (Khalaj & Pedgley, 2014)

Social values and position (SVP)(n=5)		**Usability and interaction (UI) (n=8)**		**Qualities of form (QF) (n=6)**		**Personality characteristics (PC) (n=10)**	
SVP-1	Contemporary	UI-1	Clear	QF-1	Elegant	PC-1	Attractive
	Traditional		Confusing		Inelegant		Repulsive
SVP-2	High class	UI-2	Easy to use	QF-2	Organic	PC-2	Aggressive
	Low class		Difficult to use		Geometric		Submissive
SVP-3	High technology	UI-3	Safe	QF-3	Ornate	PC-3	Futuristic

	Low technology		Dangerous		Plain		Nostalgic
SVP-4	Expensive	UI-4	Comfortable	QF-4	Innovative	PC-4	Quiet
	Cheap		Uncomfortable		Imitative		Noisy
SVP-5	Global	UI-5	Reliable	QF-5	Compact	PC-5	Mature
	Local		Unreliable		Large		Immature
		UI-6	Robust	QF-6	Symmetrical	PC-6	Exciting
			Delicate		Asymmetrical		Calm
		UI-7	Easy to clean			PC-7	Feminine
			Difficult to clean				Masculine
		UI-8	Practical			PC-8	Friendly
			Impractical				Unfriendly
						PC-9	Extraordinary
							Ordinary
						PC-10	Interesting
							Boring

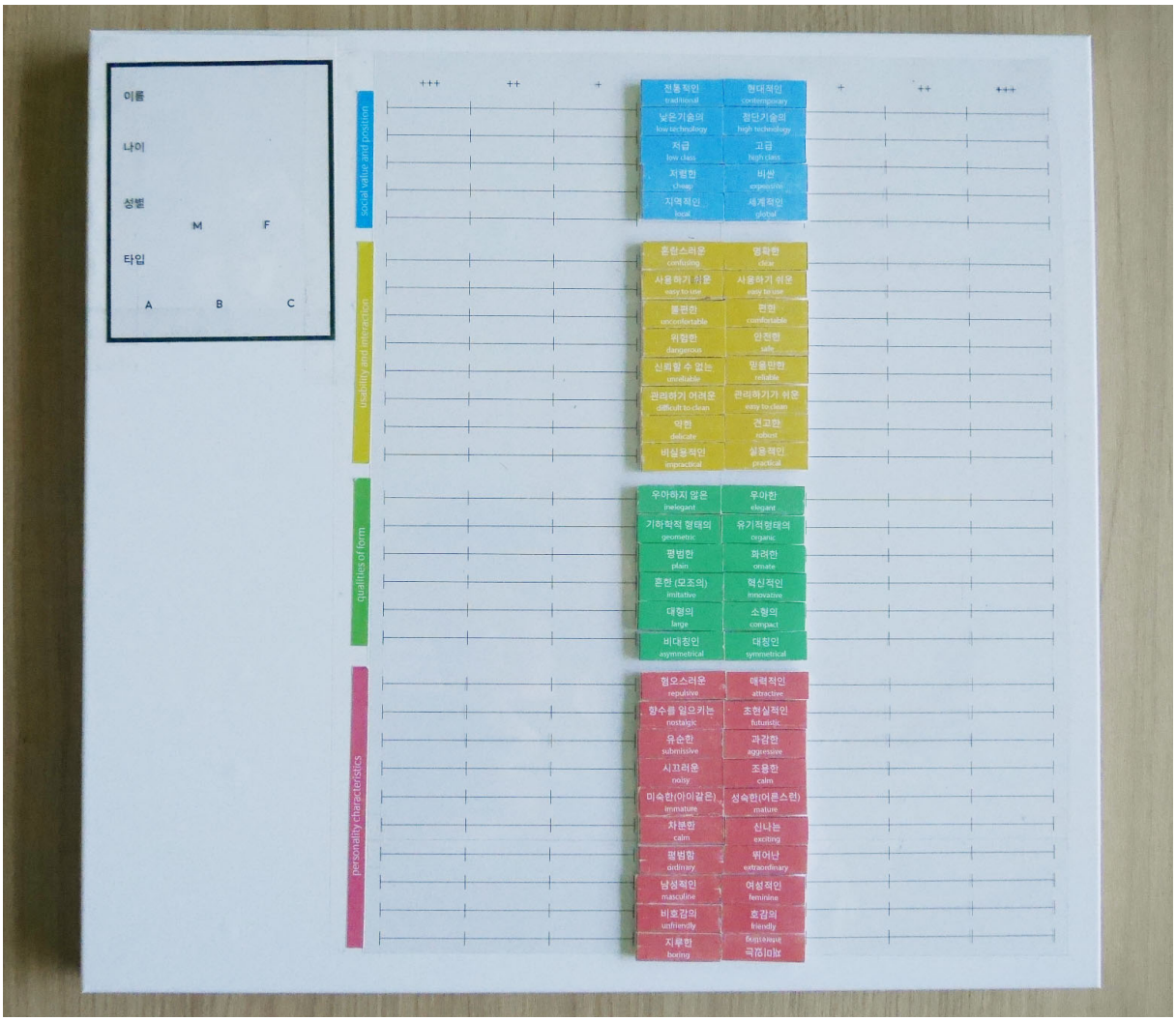


Figure 13_An instrument for measuring semantic scales(Left) and example of use (Right)

The way of using the tool is similar to card sorting. On the left side, there was an empty space for writing down participant's information and laying down the picture of experimental stimuli. On the right side of the panel, it was composed of 58 adjective cards of 29 bipolar adjectives. Blue indicates SVP, yellow UI, green QF and red PC. Instead of checking one scale among 7 point-scale between bipolar adjectives, it was asked to choose either of two bipolar adjectives at first, and move it to the degree of three levels; +(1), ++(2), +++(3). If there is no difference between two bipolar adjectives, none of both were moved. Participants were asked to evaluate SD under the question, "what meaning the inside of product would have considering packaging in terms of social value and position, usability, and interaction, qualities of form and personality characteristics?" This method encouraged participants to answer more earnest than ticking one among the box.

3.4 Procedure

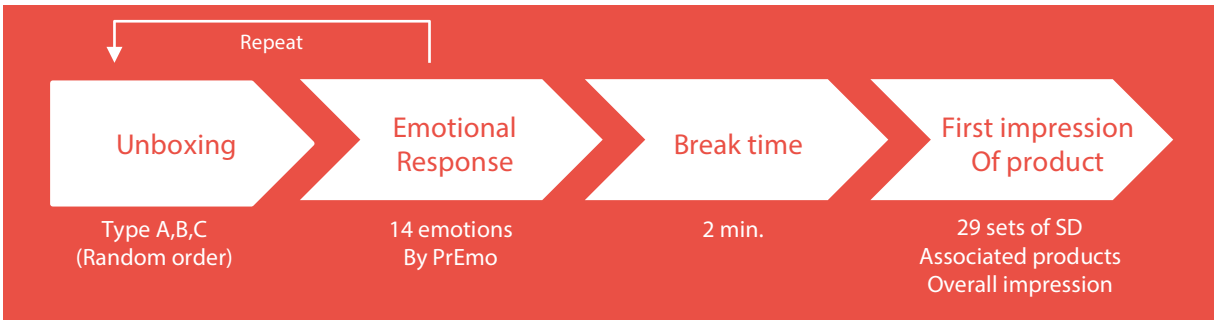


Figure 14_Procedure of experiment

In order to simulate a context for the participants' experience of interacting with the three product packaging designs, respondents were given an assumed scenario that they had just bought a new earphone and arrived home to open it. They were explained that the purpose of the experiment was to assess emotional responses to the different packaging type. At the study's first stage (Figure 14, Unboxing) participants were provided with one of the three packaging designs (Type A, B, C) and asked to open the product packaging and retrieve the device. During the second stage (Figure 14, Emotional response), subjects were shown interface of prEmo on the computer display and asked to measure emotional response to 14 different emotions. The procedure was repeated three times for each participant, with the three packaging designs randomized to limit order effect. After finishing opening three packaging and measuring emotions, 2 min break time was given (Figure 14, Break time). Then, subjects were asked to assess the first impression of product via product packaging through 29 sets of SD (Figure 14, First impression of product). Then, a short interview was conducted about what kinds of products would be suitable for such product packaging and the reasons why they thought like that.

3.5 Samples and experiment environment

A total of 45 samples (22 males, 23 females) participated in the experiment. They were recruited from the student community of UNIST and the average age was 21(SD=1.71). The samples involved in the research showed the variety in a university major, avoiding the influence of particular background to the results. The experiment was conducted in homelab in UNIST where the environment looks like the house (Figure 15).

Figure 15_Experiment environment

4. Results

4.1 Emotional responses

To verify the differences between the three packaging, SPSS 20 was used for the statistical analysis of the data. Instead of one-way ANOVA, data was analyzed through one-way MANOVA to examine if participants' emotional responses were different. 14 types of emotions as dependent variables showed correlations between variables (the result of correlation analysis was attached in the appendix). In order to avoid the risk that one-way ANOVA analysis could have caused type I error, one-way MANOVA analysis was used. Each emotion was the dependent variable, 'participant' was a random factor and packaging type as fixed factor. The mean values of each packaging type with regard to emotions were illustrated in Figure 16. A notable finding was that three types of packaging evoked different types and intensity of emotions (Table 4). The means of positive emotions in three packages such as satisfaction ($F=10.404$, $p<0.01$), fascination ($F=4.050$, $p<0.05$), and admiration ($F=15.915$, $p<0.05$) were not identical and the difference was statistically significant. The results of Scheffe-test exhibited the significant differences following emotions: satisfaction, fascination and admiration between Type B and Type A, C. Generally, Type B – packaging with interaction pattern got a higher score in positive emotions. In the case of other positive emotions, joy, the mean score was the highest of other emotions, but there was no statistically significant difference in terms of emotions among packaging types.

When it comes to negative emotions, distinct differences were exhibited among three packaging types. First of all, the emotion of dissatisfaction and fear, were evoked in Type A ($M=1.82$, $SD=1.34$) and Type C ($M=2.36$, $SD=1.30$) and it was much higher value comparing to Type B ($M=0.80$, $SD=0.97$), and the difference was statistically significant ($F=17.017$, $p<0.01$). In the case of Type B, none of the negative emotion remarkably appeared, which was a noticeable result comparing to the other types. Type C – packaging with the richness of motor skills, showed a tendency to arouse higher negative emotions compared to the other packaging types. For example, not only emotion of dissatisfaction ($M=2.36$, $SD=1.30$) but also the emotions of boredom ($M= 1.20$, $SD=1.22$) and contempt ($M= 1.41$, $SD=1.31$) were observed higher in comparison with the other packaging types and the differences were statistically significant: boredom ($F=7.208$, $p<0.01$) and contempt ($F=9.258$, $p<0.01$). Full results and descriptions of MANOVA are attached in the appendix.

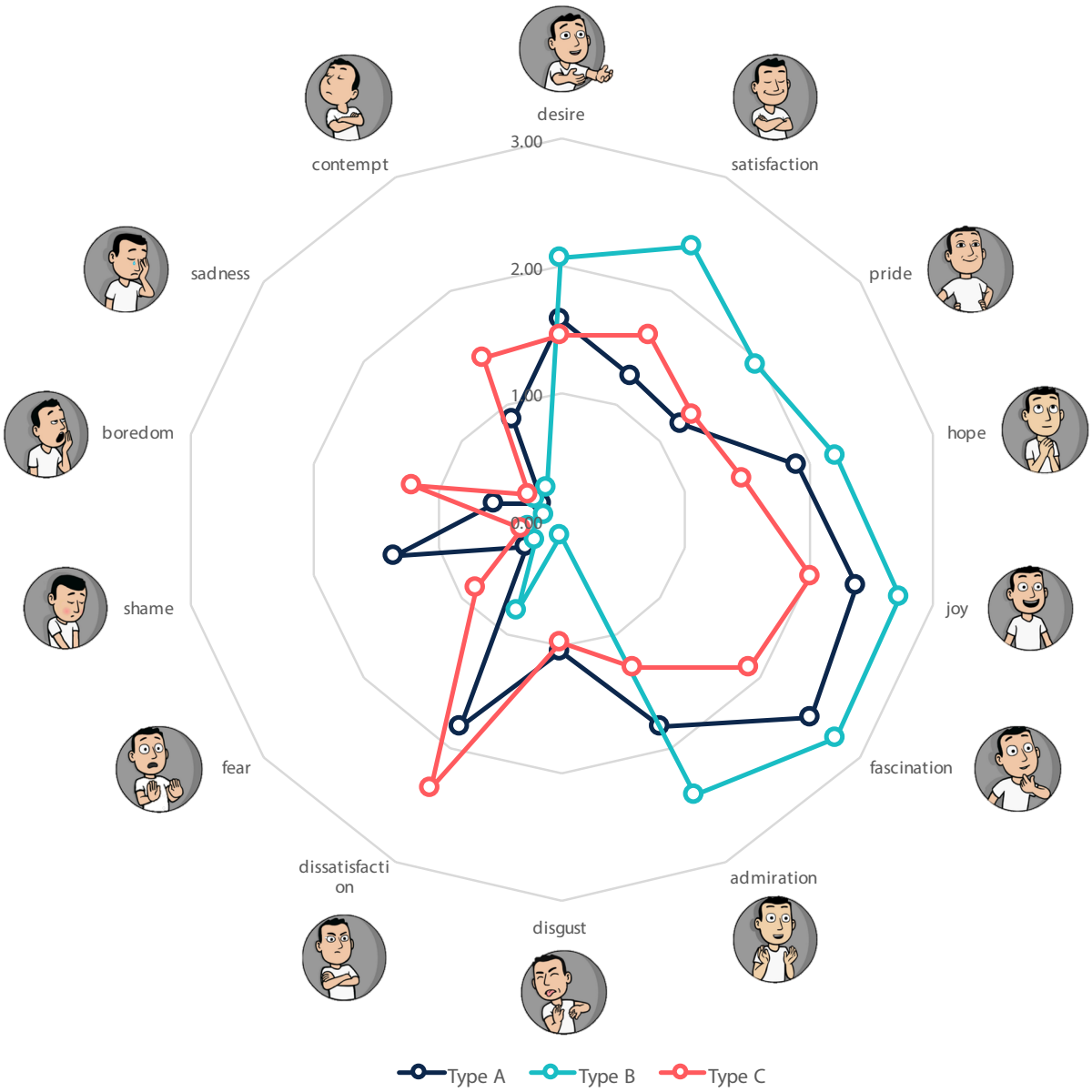


Figure 16_PrEmo®: The mean of emotional responses to the three packaging (A–C), measured on a 5-point scale, (0 = not at all and 4 = extremely). Products differed significantly on 14 emotions presented in the spider plot.

Table 6_ PrEmo®: The table displays the mean values of each emotion elicited by the three packaging.

	Package type		
	a	**b**	**c**
desire	1.57	2.07	1.44
satisfaction	1.25	2.38	1.60
pride	1.20	1.95	1.33
hope	1.91	2.23	1.47
joy	2.39	2.73	2.02
fascination	2.51	2.78	1.89
admiration	1.81	2.42	1.30

disgust	1.05	0.12	0.98
dissatisfaction	1.82	0.80	2.36
fear	0.36	0.27	0.86
shame	1.34	0.27	0.32
boredom	0.55	0.14	1.20
sadness	0.20	0.26	0.32

Table 7_7 MANOVA test results with variables of 14 emotions

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	desire	7.765[a]	2	3.883	2.971	.056	.063
	satisfaction	25.769[b]	2	12.885	10.404	.000	.191
	pride	8.176[c]	2	4.088	2.596	.080	.056
	hope	10.791[d]	2	5.395	2.900	.060	.062
	joy	5.243[e]	2	2.622	1.722	.185	.038
	fascination	11.948[f]	2	5.974	4.050	.021	.084
	admiration	36.113[g]	2	18.056	15.915	.000	.266
	disgust	39.075[h]	2	19.537	11.883	.000	.213
	dissatisfaction	49.244[i]	2	24.622	17.017	.000	.279
	fear	10.467[j]	2	5.234	6.553	.002	.130
	shame	34.126[k]	2	17.063	18.569	.000	.297
	boredom	14.605[l]	2	7.302	7.208	.001	.141
	sadness	.071[m]	2	.036	.078	.925	.002
	contempt	19.986[n]	2	9.993	9.369	.000	.176

4.2 Appraisal of first impression of the product

4.2.1 Semantic Differentials scale

In order to see if the type of aesthetic interaction on unboxing experience influenced the participants' first impression of a product, semantic differentials scales were used to measure product meaning delivered by each type of product packaging. Participants responded 29 bipolar adjective pairs and all the responses were coded into seven-point scales. The mean values between the three packaging designs were compared. Figure 17 illustrates mean differences for each of 29 adjective pairs between the three product packaging designs. A gray line in the center indicates the intermediate value between two bipolar adjectives coded the value '4'.

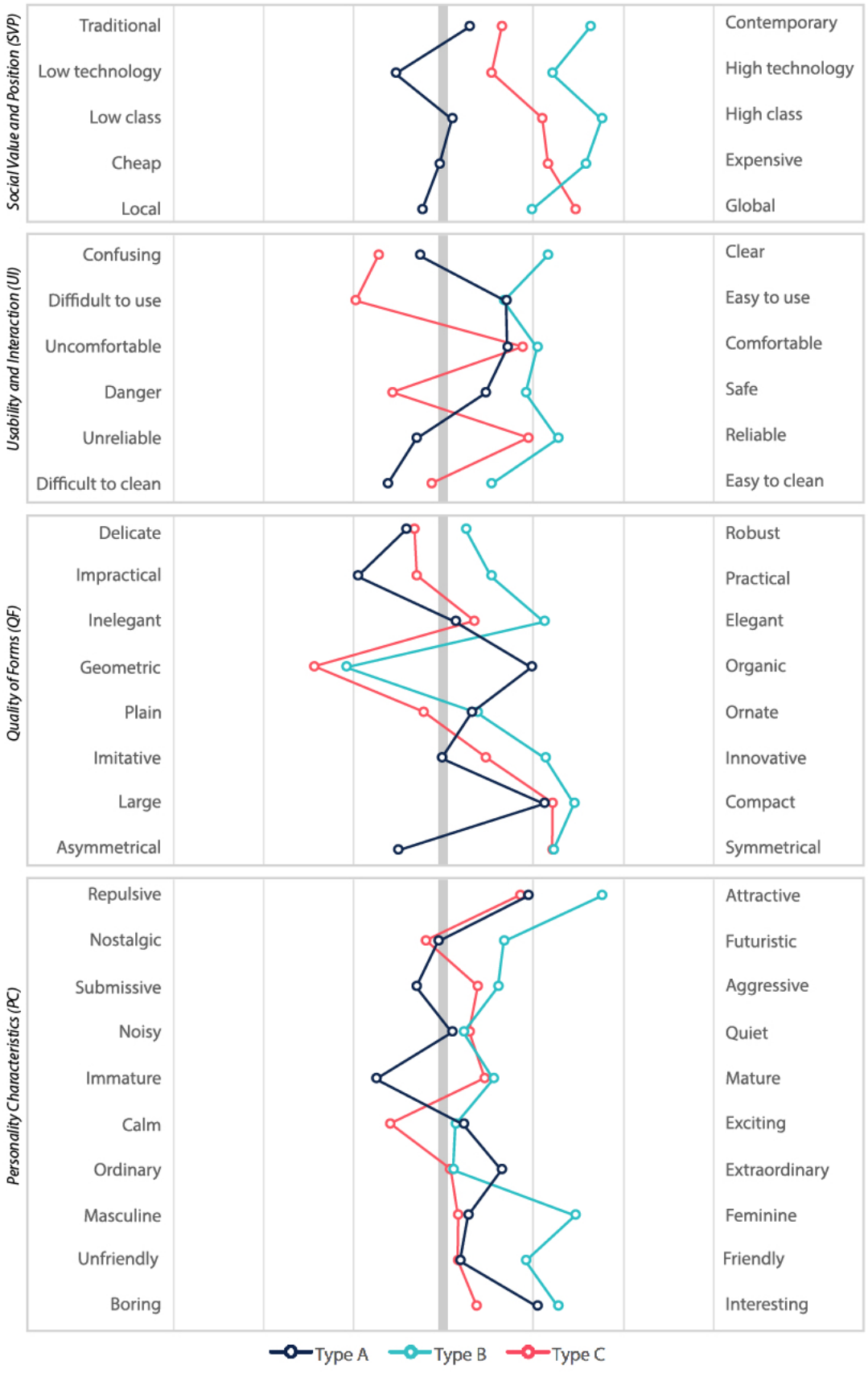


Figure 17_Semantic differential scales of three packaging

First of all, participants were asked to measure product meaning based on the interaction of unboxing packaging in terms of social value and statuses such as class, price, influence, and technology. It was measured that whether the inside product would be for people in higher or lower class or whether it would be expensive or cheap etc. ANOVA test was conducted to verify whether there was any difference between the packaging prototypes. The results showed that there were noticeable differences in the mean scores between three types of packaging (Table 8). In general, participants' appraisal of product in Type B – packaging with interaction pattern and Type C – packaging with richness of motor skills – were related to meaning of 'luxurious' such as 'contemporary', 'high class', 'expensive' and 'high technology', and it was more highly appreciated than the others. It indicates that participants anticipated that the product in packaging Type B and C would be more likely to be 'contemporary,' 'high class,' 'expensive' and 'high technology.' In the case of the product in Type A – packaging with freedom of interaction, the meaning of 'low technology' was dominant while the products of Type B and C were evaluated 'high technology'. Other semantics were located close to the center, indicating the neutral meaning of social value and position. The below table is the result of ANOVA test about semantics of social value and position, which exhibited statistically significant differences between the packaging except the adjective group 'local- global'; traditional – contemporary ($F=9.250$, $p<0.01$), low technology - high technology ($F=19.438$, $p<0.01$), low class – high class ($F=13.859$, $p<0.01$), cheap – expensive ($F=13.537$, $p<0.01$).

Table 8_ ANOVA test results with variables of the SD group of 'Social Value and Position' (n=5)

Variable		Sum of Squares	df	Mean Square	F
Traditional / Contemporary	Between Groups	42.904	2	21.452	**9.25****
	Within Groups	306.133	132	2.319	
	Total	349.037	134		
Low technology / High technology	Between Groups	68.8	2	34.4	**19.438****
	Within Groups	233.6	132	1.77	
	Total	302.4	134		
Low class / High class	Between Groups	63.333	2	31.667	**13.859****
	Within Groups	301.6	132	2.285	
	Total	364.933	134		
Cheap / Expensive	Between Groups	63.748	2	31.874	**13.537****
	Within Groups	310.8	132	2.355	
	Total	374.548	134		
Local / Global	Between Groups	69.911	2	34.956	1.695
	Within Groups	2722.489	132	20.625	
	Total	2792.4	134		

*p<.05 **P<.01

In the case of usability and interaction, participants' expectation of product usage was measured based on appraisal delivered by product packaging such as usability, safety and comfort when using the product. The results of ANOVA test showed there were significant differences in 6 out of 8 bipolar adjective groups (Table 9). The result of appraisal product in Type C packaging showed remarkable

differences comparing to the other packaging types. Most of all, when it comes to the adjective group of 'difficult to use – easy to use', participants' appraisal of product in Type C was dominant in 'difficult to use' while that of the other types belong to 'easy to use', and the difference was verified significant (F= 16.22, p<.01). Also, the semantic of 'danger' noticeably appeared in Type C, and it was opposite compared to the others where semantic of 'safe' was dominant.

Table 9_ANOVA test results with variables of the SD group of 'Usability and Interaction' (n=8)

Variable		Sum of Squares	df	Mean Square	F
Confusing / Clear	Between Groups	87.126	2	43.563	**16.937****
	Within Groups	339.511	132	2.572	
	Total	426.637	134		
Difficult to use / Easy to use	Between Groups	82.237	2	41.119	**16.22****
	Within Groups	334.622	132	2.535	
	Total	416.859	134		
Dangerous / Safe	Between Groups	2.504	2	1.252	0.598
	Within Groups	276.356	132	2.094	
	Total	278.859	134		
Uncomfortable / Safe	Between Groups	52.578	2	26.289	**11.347****
	Within Groups	305.822	132	2.317	
	Total	358.4	134		
Unreliable / Reliable	Between Groups	62.237	2	31.119	**15.37****
	Within Groups	267.244	132	2.025	
	Total	329.481	134		
Delicate / Robust	Between Groups	30.281	2	15.141	**5.06***
	Within Groups	394.978	132	2.992	
	Total	425.259	134		
Difficult to clean / Easy to clean	Between Groups	11.793	2	5.896	2.203
	Within Groups	353.289	132	2.676	
	Total	365.081	134		
Impractical / Practical	Between Groups	50.178	2	25.089	**9.952****
	Within Groups	332.756	132	2.521	
	Total	382.933	134		

*p<.05 **P<.01

Next, in order to investigate the relationship between product packaging and product appraisal in terms of quality of form, the features of product form and shape were measured. The results of the appraisal of the quality of form were also different between the product packaging types. ANOVA test showed there were significant differences in 4 out of 6 bipolar adjective groups in terms of Quality of form (Table 10). The appraisal of product in Type A packaging was dominant of adjectives such as 'organic', 'compact', 'asymmetrical', which means participants came up with 'organic,' 'compact' and 'asymmetrical' form associated with packaging Type A. It is distinguished from the other two types where 'geometric' 'symmetrical' was dominant. In the case of Type B, semantic of 'innovative' and 'elegant' were distinct compared to Type A and Type C. The product in Type C packaging was assessed to have 'geometric' form. Among 6 semantic bipolar adjective groups, 'geometric-organic' and 'Asymmetric – symmetric' exhibited observable differences between packaging types, and the

difference was statistically significant: Geometric-Organic (F=37.397, p<.01), Asymmetric – Symmetric (F=25.293, p<.01).

Table 10_ ANOVA test results with variables of the SD group of 'Quality of Forms' (n=6)

Variable		Sum of Squares	df	Mean Square	F
Inelegant-Elegant	Between Groups	24.015	2	12.007	**4.197***
	Within Groups	377.644	132	2.861	
	Total	401.659	134		
Geometric - Organic	Between Groups	153.97	2	76.985	**37.397****
	Within Groups	271.733	132	2.059	
	Total	425.704	134		
Plain - Ornate	Between Groups	9.733	2	4.867	1.755
	Within Groups	366	132	2.773	
	Total	375.733	134		
Imitative - Innovative	Between Groups	30.281	2	15.141	**6.906****
	Within Groups	289.378	132	2.192	
	Total	319.659	134		
Large – Compact	Between Groups	2.681	2	1.341	0.654
	Within Groups	270.756	132	2.051	
	Total	273.437	134		
Asymmetric – Symmetric	Between Groups	88.993	2	44.496	**25.293****
	Within Groups	232.222	132	1.759	
	Total	321.215	134		

*p<.05 **P<.01

Finally, product characteristics, properties of product aesthetic as well as a product's non-visible attributes, were measured with 10 adjectives. In the case of Type A, the semantic of 'immature' was noticeably distinguished from the other types. Also, it was appraised 'extraordinary' more than the other types. The semantics of 'Attractive', 'futuristic' 'feminine' and 'friendly' were remarkably exhibited in the appraisal of product in Type B, unlike the other types. In Type C, 'calm' was remarkable compared to the other types. Among 10 semantic bipolar adjective groups, the results of ANOVA test showed there were significant differences in 8 out of 10 bipolar adjective groups (Table 11) such as 'Repulsive – Attractive' (F=6.661, p<.01), 'Nostalgic – Futuristic' (F=4.555, p<.05), 'Submissive – Aggressive' (F=4.606, p<.05), 'Immature – Mature' (F=9.06, p<.01), 'Calm – Exciting' (F=3.646, p<.05), 'Masculine – Feminine' (F=11.217, p<.01), 'Unfriendly – Friendly' (F=3.838, p<.05), and 'Boring – Interesting' (F=3.819, p<.05).

Table 11_ ANOVA test results with variables of the SD group of 'Personality Characteristic' (n=10)

Variable		Sum of Squares	df	Mean Square	F
Repulsive - Attractive	Between Groups	22.711	2	11.356	**6.661****
	Within Groups	225.022	132	1.705	
	Total	247.733	134		
Nostalgic - Futuristic	Between Groups	19.6	2	9.8	**4.555***
	Within Groups	284	132	2.152	
	Total	303.6	134		
Submissive - Aggressive	Between Groups	20.311	2	10.156	**4.606***
	Within Groups	291.022	132	2.205	
	Total	311.333	134		
Noisy - Quiet	Between Groups	0.933	2	0.467	0.21
	Within Groups	292.667	132	2.217	
	Total	293.6	134		
Immature - Mature	Between Groups	47.57	2	23.785	**9.06****
	Within Groups	346.533	132	2.625	
	Total	394.104	134		
Calm – Exciting	Between Groups	18.326	2	9.163	**3.646***
	Within Groups	331.778	132	2.513	
	Total	350.104	134		
Ordinary – Extraordinary	Between Groups	9.304	2	4.652	2.403
	Within Groups	255.556	132	1.936	
	Total	264.859	134		
Masculine - Feminine	Between Groups	47.57	2	23.785	**11.217****
	Within Groups	279.911	132	2.121	
	Total	327.481	134		
Unfriendly - Friendly	Between Groups	16.637	2	8.319	**3.838***
	Within Groups	286.133	132	2.168	
	Total	302.77	134		
Boring - Interesting	Between Groups	20.311	2	10.156	**3.819***
	Within Groups	351.022	132	2.659	
	Total	371.333	134		

*p<.05 **P<.01

4.2.2 Metaphor of unboxing interaction

In order to investigate subjects' impression and experience on unboxing of each packaging, a short interview was conducted. Two main questions were asked in the interview session. One was what product type would be suitable for each product packaging, and the other question was what made them come up with the opinion. Subjects were allowed to give multiple responses. For analysis, the product types were arranged through affinity diagram and illustrated based on frequency percentile. All comments were analyzed through two coding processes; First, descriptive coding was carried out to create codes. In vivo coding analysis, using the participants' own language, was conducted. Followings are the results and detailed description of each product packaging.

- **Type A – Packaging with freedom of interaction**

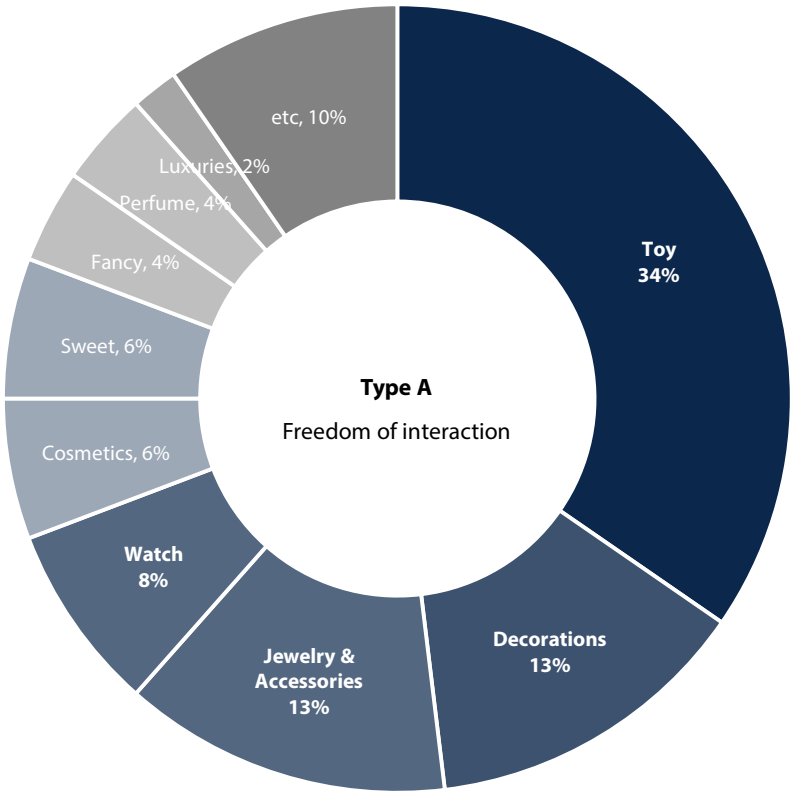


Figure 18_Product types associated with packaging type A

Table 12_The results of coding of associated metaphor of Type A packaging (Freedom of interaction)

Type A (freedom of interaction)	Metaphor between Product - Packaging	Metaphor between Packaging - User	Unboxing Verb (Interaction)	Experience
	"Buried" "Hidden on the ground" "Just contained" "Abandoned" "Mystery"	"Treasure hunting" "Hide-and-seek" "Making fun of me" "Surprising present" "Drawing lots"	"Explore" "Find" "Take out" "Play"	"evoking curiosity" "Interesting" "A little nervous" "Common place" "Confusing"

Figure 18 shows the graph illustrating the frequency percentile of product types associated with packaging type A. Among respondents' multiple responses on product types, the product category of 'Toy' was the most frequently mentioned as associated product with packaging type A (34%). Decorations (13%), Jewelry & Accessories (8%), and watch (8%) were followed. It showed similar results in line with the appraisal of product semantic. In case of the A packaging, the semantic adjectives of 'low technology', 'impractical', 'organic' 'asymmetrical', 'immature' and 'interesting'

were dominant compared to the other types, and the product types associated with the packaging were also alike. Through descriptive coding and in vivo coding, it was figured out that what came up with participants' mind and most of their responses took the form of metaphor. Table 12 showed the result of the coding analysis. In the case of Type A packaging, participants appraised the structure between packaging and the inside product as if it was "buried", "hidden on the ground", "just contained" or even "abandoned" by the packaging. The action of unboxing was described with the verb such as "Explore", "Find", "Take out" and "Play" with the product and its activity reminded them "Treasure hunting", "Hide-and-seek", "Making fun of me", "Surprising present" and "Drawing lots". It implied why aforementioned product types were recalled to subjects; the interaction might have encouraged the subjects to explored and find the product in the packaging box, and it reminded childish activities such as treasure hunting, seek-and-hide. It can explain why toy, decorative products whose features are mostly 'organic,' 'asymmetrical,' 'immature' and 'interesting' were associated with the packaging Type A.

- **Type B – Packaging with interaction pattern**

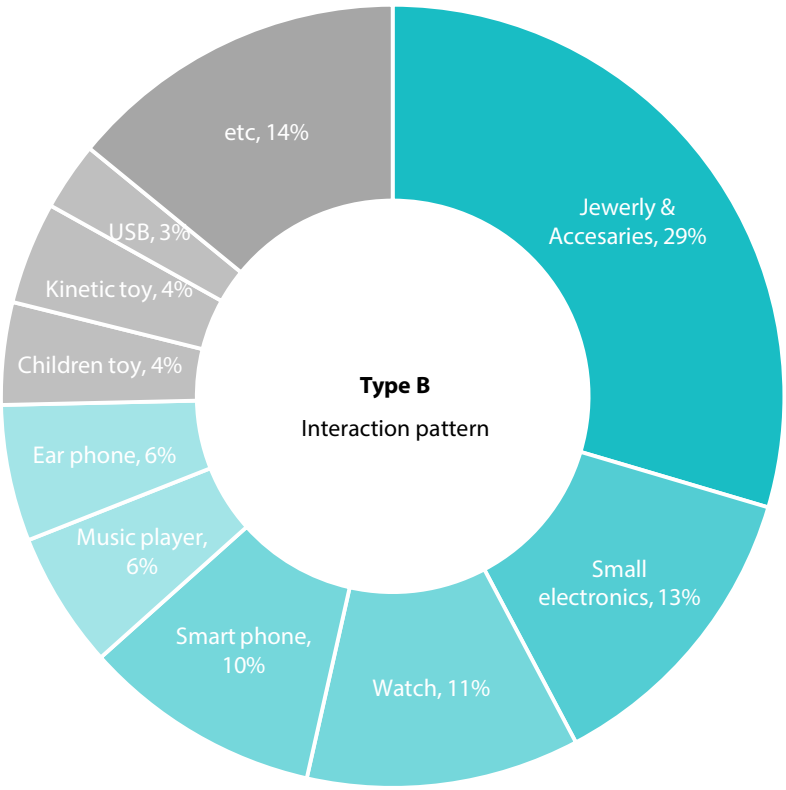
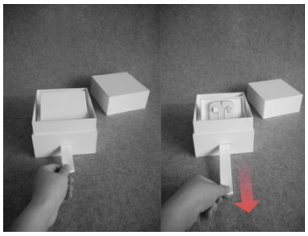


Figure 19_Product types associated with packaging type B

Figure 19 shows the graph illustrating the frequency percentile of product types associated with packaging type B. The product category of 'Jewelry and accessories' – ring, earring, necklace - was the most dominant (29%) in type B packaging. 'Small electronics' (13%), defined as electrical products mostly utilized for personal use such as notebook, tablet, camera, was followed. 'Watch (11%),' 'smartphone (10%)' and 'music players (6%)' were followed next. Looking into the semantics appraised via type B packaging – 'high class', 'contemporary', 'expensive', 'comfortable', 'elegant', 'feminine', 'innovative' were noticeably exihibited. The results of associated product type via packaging showed similarities to the product semantic.

Table 13_The results of coding of associated metaphor of Type B packaging (Interaction pattern)

Type B (Interaction pattern)	Metaphor between Product - Packaging	Metaphor between Packaging - User	Unboxing Verb (Interaction)	Experience
	"Cared" "Unpublished" "Veiled (covered)" "Princess waiting for prince" "Precious and valuable" "Dressing table" "Displayed" "Jewelry box"	"Appear on stage" "Ballet" "Fancy effect" "Waiting" "Show off" "Look at me" "Event" "Ta-da!" "Go on the rides"	"Surprise" "Propose" "Be exposed" "Unveil" "Pop-up" "kinetic move"	"Look expensive" "For special version" "Novel and unprecedented" "High expectation" "Fluttered" "Luxurious" "In advanced" "Impressive"

When it comes to the metaphor between product and packaging, the feminine expressions such as "Princess waiting for prince", and "Dressing table" appeared in packaging B, unlike Type A packaging (Table 13). Also, the terms related to 'secret' were dominant such as "Cared", "Unpublished", "Precious and valuable" and "Veiled (covered)". The action of unboxing was described with the verb such as "Appear on stage", "Ballet", "Fancy effect", "Waiting", "Show off", "Look at me", "Event", and "Ta-da!" with product. The activities reminded them such as "Surprise", "Propose", "Be exposed" and "Pop-up" movement. In the case of Type B, the unboxing interaction evoked particular events related to surprising and raising-expectation moment, due to the rotating motion of packaging unboxing. The interaction might have reminded the subjects at the event of "Surprise", "Propose", "Pop-up," which were very precious and meaningful time. It might have explained why those semantics of 'high class,' 'contemporary,' 'expensive,' 'comfortable,' 'elegant,' 'feminine,' and 'innovative were dominant of packaging Type B.

- **Type C – Packaging with richness of motor skill**

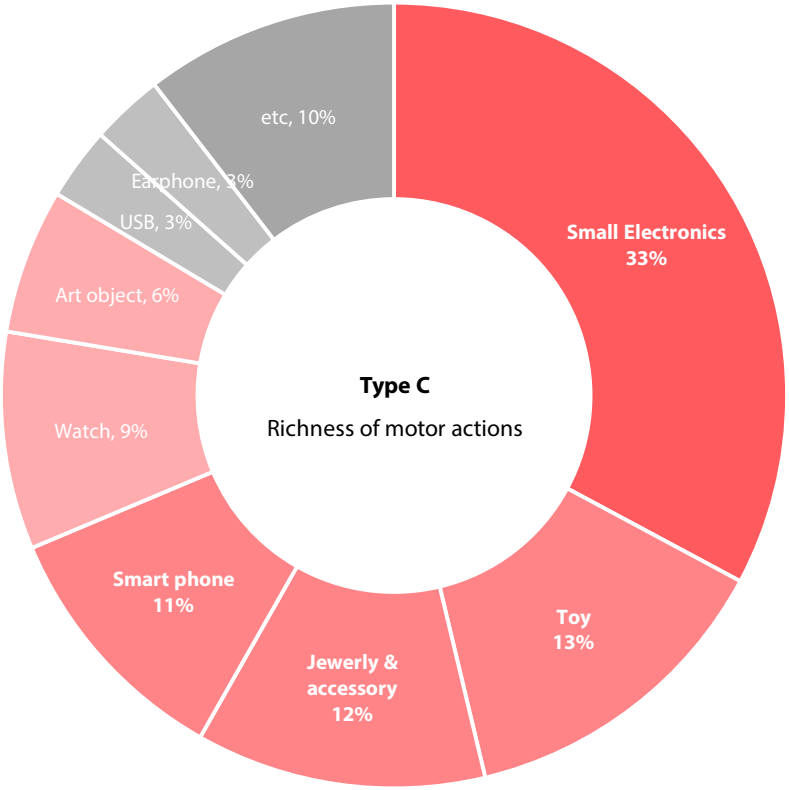
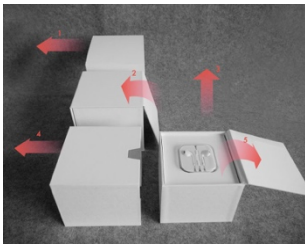


Figure 20_ Product types associated with packaging type C

Figure 20 shows the graph illustrating the frequency percentile of product types associated with packaging Type C. Among respondents' multiple responses on product types, the most frequently answered the product category was 'Small electronics' and it occupied one third of responses. For next, Toy (13%), Jewelry & Accessories (12%), and Smartphone (11%) were followed. It showed similar results in line with the appraisal of product semantic. In case of the C packaging, the semantic adjectives of 'global', 'difficult to use', 'geometric', 'comfortable', 'danger', 'confusing', mostly related to functions and practicality, were dominant compared to the other types. The dominant product types associated with the packaging was similar to the semantic result.

Table 14_ The results of coding of associated metaphor of Type C packaging (richness of motor actions)

Type C (richness of motor actions)	Metaphor between Product - Packaging	Metaphor between Packaging - User	Unboxing Verb (Interaction)	Experience
	"Tied up tight" "Concealed" "well protected" "Confined in a room" "Shy girl" "Secret" "Sensitive" "Sincere" "Holiness" "Matryoshka (Russian doll)"	"Take an obstacle" "Solve puzzle" "Deceived" "Bothering" "Evoking expectation" "Adventure" "Show off" "Teasing me" "Attached"	"Excavate" "Operate" "Take off" "Repeat" "Peel" "Behave logically"	"Annoying" "Well-protecting" "Reliable" "Cost money" "Limited version" "Something Extraordinary" "Boring" "Unapproachable" "Excessive" "Too complicated" "Safety"

Similar to previous results, participants perceived the configuration of packaging and its product at first. In the case of C type packaging, participants appraised the structure between packaging and the inside product as if the product was "tied up tight", "concealed", "well protected" by the packaging. It looked like "confined in a room" (Table 14). Also, it associated the sense of "secret", "sensitive", "sincere" and "holiness" and it reminded Matryoshka - Russian doll, which refers to a set of wooden dolls of decreasing size placed one inside another. Participants described the action of unboxing as the verb such as "excavate", "operate", "take off", "repeat", "peel" and "behave logically."
They responded that the activity reminded them "take an obstacle," "solve puzzle," "deceived" and "adventure." The responses mentioned by participants were divided into two major trends. First, there were positive opinions that the packaging gave a sense of "well protecting" that the packaging had cared a lot the insdie product, which endowed meanings to the product "extraordinary", "unapproachable" and "limited edition" indicating something very precious in scarcity. The results resembled the SD results that 'high class' and 'expensive' were dominant in semantic appraisals of the product. On the other hand, there were negative responses that the product packaging with many tasks aroused "annoying" "boring" and "excessive" feelings. Those perceptions would have influenced to the first impression of the product that would be 'difficult to use', 'confusing' and even 'danger' to use.

5. Discussion

The three factors of aesthetic interaction were adopted to reveal the relationship between aesthetic interaction and emotional response in packaging design. Design guidelines for each type of aesthetic interaction were formulated: one was 'freedom of interaction' indicating interaction type which does not have fixed order or sequence so that it can be opened in various ways. Another was 'interaction pattern' which refers to the coincidence of movement between user's action and reaction to the package. User's action and the reaction of packaging are naturally coupled in terms of timing and flow. The other was 'richness of motor actions' that indicates the interaction composed of series of sequential procedure following a number of tasks that requires user's cognitive skill. Adopting a research-through-design approach, the constructs were then used as criteria to drive the design and development of three different types of product packaging. They were prototyped and used as experiment stimuli to assess user emotional response and the appraisal of inside product personality to measure the first impression on the product. Participant's emotional responses were collected through PrEmo, a tool to measure product emotion and through the semantic differentials.

5.1 Emotional arousal by unboxing packaging

According to the results of measuring emotion via PrEmo, two positive emotions, joy and fascination had the highest score of all the packaging types. However, there was no statistically significant difference in emotional arousal between the three packagings. It indicates that the activity of unboxing itself would be the main contributor that arouses positive emotions regardless of the types of aesthetic interaction. The result is in line with the previous study of Desmet (2007) that opening phase of the product is associated high level of emotion. It can explain why unboxing videos are getting popular; unboxing videos would deliver joyful and fascinating emotions to watchers and they get vicarious satisfaction from watching those videos (Figure 21). It also explains why online articles described unboxing as "boxes of delight" and even "the new geek porn". Thus, the unboxing experience should be regarded a critical moment and touching point that companies and design practitioners should "create" and "design" to deliver positive emotions, not letting it just happen by itself.

Figure 21_an example of unboxing videos: a man unboxing Apple iMac packaging
(Source from the article of "Unboxing: The new geek porn")

Comparing emotions evoked by the three types of product packaging, the results provide evidence to indicate the interaction of unboxing in packaging design can draw different types and intensity of emotions. In the case of Type B, which got the highest scores in positive emotions, the results suggest an effective way to design product packaging to arouse positive emotions: to apply 'rhythm, flow and timing' into packaging structure so that it can show 'interactive effect' when people unbox packaging. Positive reaction to the way of unboxing - intuitive yet unique in a sense that the inside box holding the product is rotating according to participants' opening action – may be the core contributor that surprises participants and delivers unexpected positive emotions. Even though Chavalkul (2011) claimed that novel opening mechanism could mislead user, and thus it should be avoided, the result of the study showed that novel opening also would give opportunities to please users while they were unboxing.

The difference between the package types was shown most noticeably in the assessment of negative emotions of 'dissatisfaction'. Especially, in the case of Type C, the negative emotion was the highest among 14 types of emotions. In addition, 'boredom' and 'contempt' were much more associated with Type C than the other types. This result might have to do with the number of tasks that participants had to carry out while taking the product out of the box, which might have worked as 'burden'. Of course, complicated packaging requiring several tasks for unboxing could provoke thrill and excitement on the other hand, but a number of assignments could surely make the user bored and annoyed. It would be something that design practitioners should avoid when they create a product package for delivering a better unboxing experience. Like developing a product, in designing a product package, it is also important to take usability and comfort into account so that people avoid

the occurrence of negative emotions while unboxing. This result is in line with the finding in the previous study that packaging opening, accompanied by sensory functions, cognitive functions, perception, memory and hand functions, should be carefully considered and tested in order not to frustrate user, especially elderly people who are not familiar with such complicated packaging (Chavalkul et al., 2011; Wang & Mu-Chien, 2011).

5.2 The influence of unboxing on the first impression of product

In order to figure out the impact of unboxing interaction on the first impression of the product, 29 adjectives of product semantic differential scales were measured and product categories were identified which would be best suitable for each package type.

First of all, the results show that each interaction type of unboxing significantly influenced the participants' appraisal of the packaged product's semantics. There were significant differences in terms of product evaluation of social value and position between the three types of packaging. It indicates that it is possible to provide a product with a sense of 'luxurious' and 'high-quality' by packaging interaction. For instance, Type B was much more highly assessed as 'expensive', 'high class' and 'contemporary' in comparison to the other two package designs. It implies that the interaction types of unboxing may be applicable to design specific semantics (e.g. delivering a brand image).

When it comes to product appraisal of usability and interaction perspective, the result of Type C was remarkable. Unlike the other two package types, the experience of Type C was negatively assessed such as 'difficult to use' and 'confusing'. This result might be due to the packaging structure consisting of four pieces. It required much time to take it out. In the case of Type A, undefined sequence and order of interaction could provide a sense of safety giving the impression that the inside product form would not have any edge or angle that could damage people while exploring a product in the package. On contrary, product appraisal of Type B, the inside product was estimated as 'clear', 'comfortable' and 'easy to use', which was the opposite results compared with Type C. Considering the results, it would not be an overstatement to say that product appraisal is highly associated with the opening method of packaging. On the other hand, Type A has outstanding results in terms of quality of form in comparison to the others. The appraisal of 'organic and asymmetrical' form was dominant.

Finally, the results of the appraisal of product personality show that types of unboxing interaction would be associated with different types of semantics. For instance, the semantic adjectives of 'feminine' and 'attractive' were remarkably noticable in Type B while 'immature' was in Type A. The product personality in Type C was assessed 'calm'. Those results were in line with the participants' responses to the product associated with unboxing interaction and metaphor (Figure 22,23 and 24).

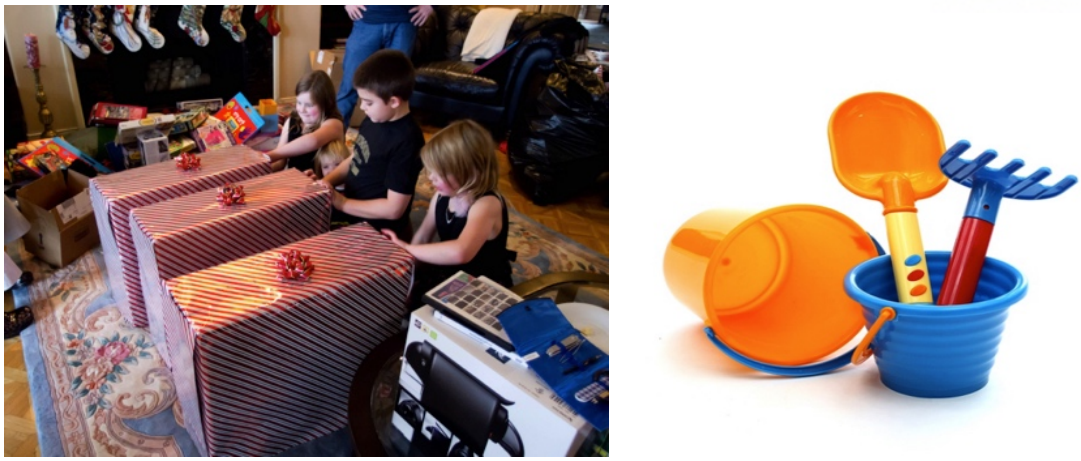


Figure 22_ The metaphor of unboxing interaction of Type A (left), Representative product category of Type A(right)

Figure 23_ The metaphor of unboxing interaction of Type B (left), Representative product category of Type B (right)

Figure 24_ The metaphor of unboxing interaction of Type C (left), Representative product category of Type C(right)

The results show that the packaging interaction of unboxing would be associated with particular contexts and metaphor. Unboxing Type A package was described as the verbs such as ‘explore’,

‘find’, and ‘play’ which would recall the activity of treasure hunting and hide-and-seek that children usually play. It might have much to do with products relevant to children and kids. With regard to the association, ‘toy’ and ‘decorative product’ were mentioned as the best product for the packaging interaction (Figure 22). The result of Type B also shows the similar trend: due to the association evoked by unboxing interaction, products related to the context of giving a gift and proposal were mentioned such as pieces of jewelry and accessories (Figure 23) and the interaction was described with verb such as ‘Surprise’, ‘Propose’, ‘Be exposed’, and ‘Unveil’. It might explain why the semantic adjectives such as ‘elegant’ and ‘high-quality’ were predominant as the first impression of the product in terms of quality of product design and its characteristic would be likely to be ‘feminine.' In the case of Type C, the unboxing interaction consisting of several tasks is associated with the images of ‘take an obstacle’ and ‘adventure’ even ‘solve puzzle’ and ‘well protecting’. Those semantics might have provided an impression of extraordinary so that the product was appraised ‘limited version’ and ‘very refined product’ such as electronic devices (Figure 24). Those results imply that unboxing can stimulate past memories of context where people have experienced similar patterns of interaction, and it would be possible to influence the product appraisal and emotional experience.

5.3 Design implications

First of all, the results of this study showed that opening the package can be a pleasant experience. Since such emotions will be aroused by unboxing activity itself, it seems design practitioners do not have to exert much effort to deliver positive emotions at the stage of designing packaging. However, it is important not to make negative emotions provoked due to the usability of packaging design as well as too much tasks for opening packaging seen in the cases of Type A and Type C.

Also, some conclusions were drawn that unboxing interaction has much to do with evoking users emotions as well as determining the first impression of a product. It may be possible for design practitioners to deliver an intended semantic image or even brand image for a product through articulating unboxing interaction, especially in terms of social value and position such as high class, contemporary images.

When it comes to product categories far from higher social value and position, it is hard to give impressive feelings to people so it is difficult to leave strong brand images. In that case, utilizing unboxing interaction may be an effective way to deliver the core value of product and meaning. For example, one result of the current study was unboxing could be associated with particular

activity such as treasure-hunting, marriage propose and enhanced safety. If a product can not directly give such meanings to consumers, articulating interaction of unboxing packaging would induce particular association to communicate with people. This is also an implication for design practitioners when designing packaging. Mostly, they have considered packaging graphic elements such colors, shapes and fonts to follow product core value and concept. However, when designers want to embed context based semantics onto a product, treasure hunting for example, it was hard to realize such concept through visual elements. If they intend context related concept and emphasize activity, it will be more effective to focus on unboxing interaction in packaging design. Also, brand managers can utilize unboxing interaction as an addition to enhance brand identity and value by putting semantic differentials scales such as elegant, easy-to-use to through unboxing interaction.

5.4 Limitations and further study

Although the current study has provided design implications from the different types of interaction in product packaging such as emotional experience and appraisal of the packaged product, it would not be enough to generalize the findings. When it comes to experiment stimuli, only one type of packaging for earphones was designed and prototyped in the study. If two or more product package types had been designed to figure out the influence of interaction type, it would have been possible to support the generalization firmly.

First of all, especially in a case of food packaging, the emotional response and the product appraisal might be different from the results of the current study in a sense the function of protecting food packing – keep food fresh and antiseptic – is far from box packaging of consumer products but more significant than other consumer products. Since the core function of food packaging is protecting the inside items, its focus is on the way of sealing and packing rather than providing pleasant feeling or interaction. Considering unique features of food, studies about unpacking food packaging are recommended aside from other consumer products packaging.

Similarly, there is an issue of the key function of packaging: protecting the inside item. Therefore, depending on the significant level of protecting function, unpacking or unboxing activity and interaction will be influenced a lot. Therefore, further studies should investigate how the appraisal of various products and product categories may be influenced by different types of aesthetic interaction in terms of unboxing experience.

Moreover, even though the experiment stimuli were designed in a way to enhance interaction aspects, other relevant interaction elements were not taken into consideration such as touch

experience on material or sound experience caused from friction, etc. Despite these limitations, this study lays the foundation for future work on exploring product packaging as a critical element of user experience in the product-life-cycle.

6. Conclusions

Until recently it seems that only visual elements of product packaging have been spotlighted as an important factor to catch consumer's eyes and deliver brand communication. However, nowadays unboxing experience at before-use stage has been regarded as a critical moment that design practitioners should put more spirit into their product packages since consumers are increasingly getting interested in and appreciating the moment. As an attempt to examine the potential of packaging design regarding interaction, this study tried to figure out the influence of interaction of unboxing packaging upon emotional experience towards and appraisal of the packaged product at the moment of opening (unboxing) packaging. To achieve this, I conducted the literature review to define the scope of the investigation upon the unboxing phenomenon and unboxing phase of the product lifecycle as one element of OOBE. As an exploratory study with research through design approach, three types of packaging were created and prototyped according to the design guidelines applying the three concepts of aesthetic interaction. User emotional responses and product appraisal were measured through PrEmo tool and Semantic Differential method. The overall findings indicate that the interaction of packaging has many potentials to draw positive emotions leaving a strong impression to users about the product. Also, it seems that the unboxing interaction can be used as an effective design method to deliver semantic appraisal of product at the earlier stage of the product lifecycle regarding the social value and product personality. These implications will be practical to design practitioners when designing product packaging to enhance product experience and product brand image. Also, creating product packaging to deliver better unboxing experiences would be promising in a sense that it could stimulate positive emotions.

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Appendix

Appendix 1_ the result of MANOVA for PrEmo emotional responses

Tests of Between-Subjects Effects (MANOVA)

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	desire	7.765[a]	2	3.883	2.971	.056	.063
	satisfaction	25.769[b]	2	12.885	10.404	.000	.191
	pride	8.176[c]	2	4.088	2.596	.080	.056
	hope	10.791[d]	2	5.395	2.900	.060	.062
	joy	5.243[e]	2	2.622	1.722	.185	.038
	fascination	11.948[f]	2	5.974	4.050	.021	.084
	admiration	36.113[g]	2	18.056	15.915	.000	.266
	disgust	39.075[h]	2	19.537	11.883	.000	.213
	dissatisfaction	49.244[i]	2	24.622	17.017	.000	.279
	fear	10.467[j]	2	5.234	6.553	.002	.130
	shame	34.126[k]	2	17.063	18.569	.000	.297
	boredom	14.605[l]	2	7.302	7.208	.001	.141
	sadness	.071[m]	2	.036	.078	.925	.002
	contempt	19.986[n]	2	9.993	9.369	.000	.176
Intercept	desire	249.846	1	249.846	191.216	.000	.685
	satisfaction	252.790	1	252.790	204.129	.000	.699
	pride	212.366	1	212.366	134.884	.000	.605
	hope	305.598	1	305.598	164.243	.000	.651
	joy	461.437	1	461.437	303.161	.000	.775
	fascination	485.977	1	485.977	329.451	.000	.789
	admiration	89.530	1	89.530	78.910	.000	.473
	disgust	237.832	1	237.832	144.655	.000	.622
	dissatisfaction	263.231	1	263.231	181.928	.000	.674
	fear	24.028	1	24.028	30.086	.000	.255
	shame	40.211	1	40.211	43.760	.000	.332
	boredom	42.341	1	42.341	41.793	.000	.322
	sadness	6.917	1	6.917	15.194	.000	.147
	contempt	64.683	1	64.683	60.644	.000	.408
type	desire	7.765	2	3.883	2.971	.056	.063
	satisfaction	25.769	2	12.885	10.404	.000	.191
	pride	8.176	2	4.088	2.596	.080	.056
	hope	10.791	2	5.395	2.900	.060	.062
	joy	5.243	2	2.622	1.722	.185	.038
	fascination	11.948	2	5.974	4.050	.021	.084
	admiration	36.113	2	18.056	15.915	.000	.266
	disgust	39.075	2	19.537	11.883	.000	.213
	dissatisfaction	49.244	2	24.622	17.017	.000	.279
	fear	10.467	2	5.234	6.553	.002	.130
	shame	34.126	2	17.063	18.569	.000	.297

	boredom	14.605	2	7.302	7.208	.001	.141
	sadness	.071	2	.036	.078	.925	.002
	contempt	19.986	2	9.993	9.369	.000	.176
Error	desire	114.982	88	1.307			
	satisfaction	108.978	88	1.238			
	pride	138.550	88	1.574			
	hope	163.737	88	1.861			
	joy	133.944	88	1.522			
	fascination	129.810	88	1.475			
	admiration	99.843	88	1.135			
	disgust	144.683	88	1.644			
	dissatisfaction	127.327	88	1.447			
	fear	70.280	88	.799			
	shame	80.863	88	.919			
	boredom	89.154	88	1.013			
	sadness	40.061	88	.455			
	contempt	93.860	88	1.067			
Total	desire	370.000	91				
	satisfaction	382.000	91				
	pride	356.000	91				
	hope	481.000	91				
	joy	601.000	91				
	fascination	631.000	91				
	admiration	231.000	91				
	disgust	418.000	91				
	dissatisfaction	444.000	91				
	fear	104.000	91				
	shame	160.000	91				
	boredom	146.000	91				
	sadness	47.000	91				
	contempt	179.000	91				
Corrected Total	desire	122.747	90				
	satisfaction	134.747	90				
	pride	146.725	90				
	hope	174.527	90				
	joy	139.187	90				
	fascination	141.758	90				
	admiration	135.956	90				
	disgust	183.758	90				
	dissatisfaction	176.571	90				
	fear	80.747	90				
	shame	114.989	90				
	boredom	103.758	90				
	sadness	40.132	90				

	contempt	113.846	90

a. R Squared = .063 (Adjusted R Squared = .042)

b. R Squared = .191 (Adjusted R Squared = .173)

c. R Squared = .056 (Adjusted R Squared = .034)

d. R Squared = .062 (Adjusted R Squared = .041)

e. R Squared = .038 (Adjusted R Squared = .016)

f. R Squared = .084 (Adjusted R Squared = .063)

g. R Squared = .266 (Adjusted R Squared = .249)

h. R Squared = .213 (Adjusted R Squared = .195)

i. R Squared = .279 (Adjusted R Squared = .263)

j. R Squared = .130 (Adjusted R Squared = .110)

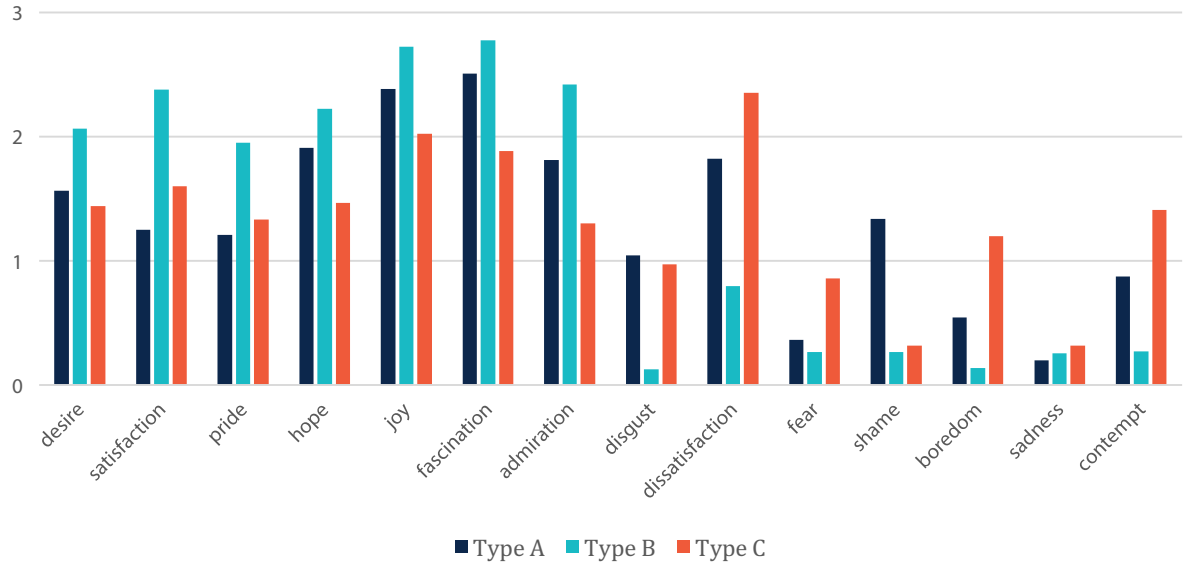
k. R Squared = .297 (Adjusted R Squared = .281)

l. R Squared = .141 (Adjusted R Squared = .121)

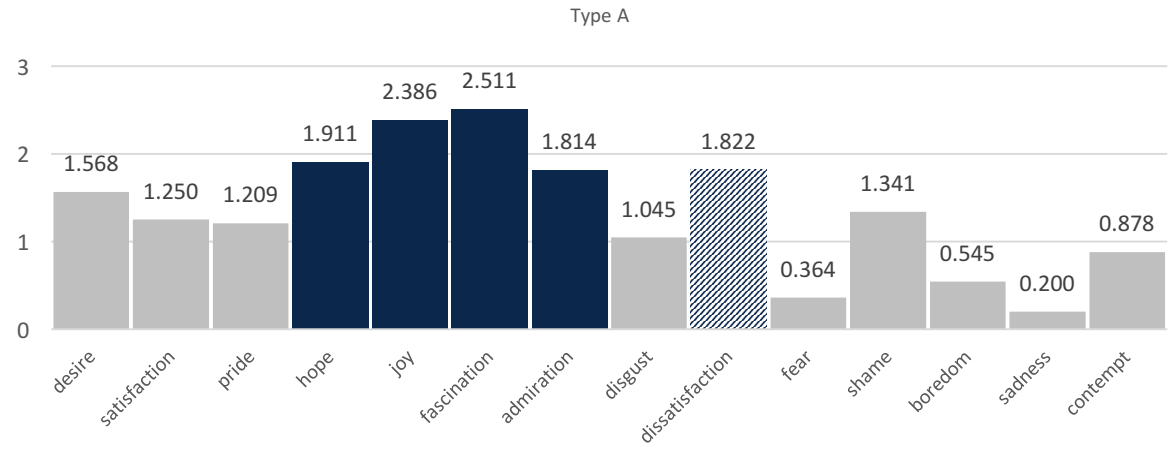
m. R Squared = .002 (Adjusted R Squared = -.021)

n. R Squared = .176 (Adjusted R Squared = .157)

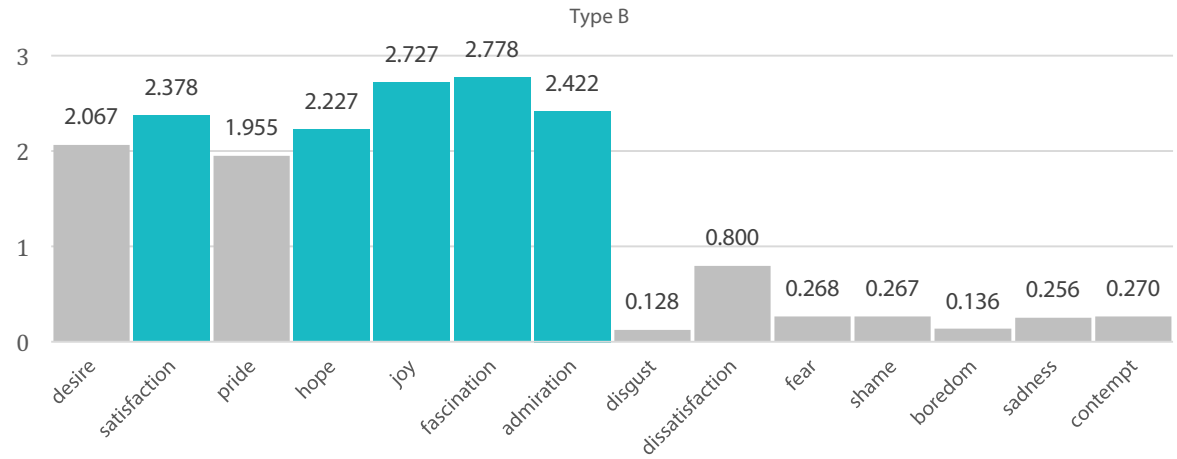
Appendix 2_ the comparison of emotional responses between the packages



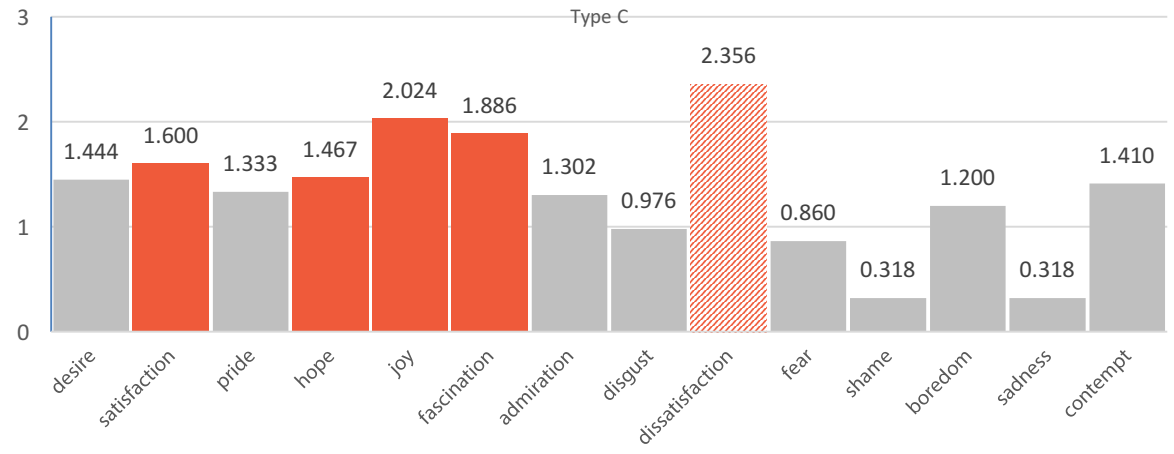
Appendix 3_ the emotional responses of Type A



Appendix 4_ the emotional responses of Type B



Appendix 5_ the emotional responses of Type C



Appendix 6_ the result of ANOVA for SD scales

Tests of Between-Subjects Effects (MANOVA)

		SS	df	MS	F	Sig.
traditional - contemporary	Between Groups	42.904	2	21.452	9.25	0.00
	Within Groups	306.133	132	2.319		
	Total	349.037	134			
low technology – high technology	Between Groups	68.8	2	34.4	19.438	0.00
	Within Groups	233.6	132	1.77		
	Total	302.4	134			
low class – high class	Between Groups	63.333	2	31.667	13.859	0.00
	Within Groups	301.6	132	2.285		
	Total	364.933	134			
cheap - expensive	Between Groups	63.748	2	31.874	13.537	0.00
	Within Groups	310.8	132	2.355		
	Total	374.548	134			
local - global	Between Groups	69.911	2	34.956	1.695	0.19
	Within Groups	2722.489	132	20.625		
	Total	2792.4	134			
confusing – clear	Between Groups	87.126	2	43.563	16.937	0.00
	Within Groups	339.511	132	2.572		
	Total	426.637	134			
Difficult to use – easy to use	Between Groups	82.237	2	41.119	16.22	0.00
	Within Groups	334.622	132	2.535		
	Total	416.859	134			
Uncomfortable - comfortable	Between Groups	2.504	2	1.252	0.598	0.55
	Within Groups	276.356	132	2.094		
	Total	278.859	134			
Danger - safe	Between Groups	52.578	2	26.289	11.347	0.00
	Within Groups	305.822	132	2.317		
	Total	358.4	134			
Unreliable- reliable	Between Groups	62.237	2	31.119	15.37	0.00
	Within Groups	267.244	132	2.025		
	Total	329.481	134			
Difficult to clean – easy to clean	Between Groups	30.281	2	15.141	5.06	0.01
	Within Groups	394.978	132	2.992		
	Total	425.259	134			
Delicate - robust	Between Groups	11.793	2	5.896	2.203	0.12
	Within Groups	353.289	132	2.676		
	Total	365.081	134			
Impractical - practical	Between Groups	50.178	2	25.089	9.952	0.00
	Within Groups	332.756	132	2.521		
	Total	382.933	134			
Inelegant-Elegant	Between Groups	24.015	2	12.007	4.197	0.017
	Within Groups	377.644	132	2.861		
	Total	401.659	134			
Geometric - Organic	Between Groups	153.97	2	76.985	37.397	0
	Within Groups	271.733	132	2.059		
	Total	425.704	134			
Plain - Ornate	Between Groups	9.733	2	4.867	1.755	0.177
	Within Groups	366	132	2.773		
	Total	375.733	134			
Imitative - Innovative	Between Groups	30.281	2	15.141	6.906	0.001
	Within Groups	289.378	132	2.192		
	Total	319.659	134			
Large – Compact	Between Groups	2.681	2	1.341	0.654	0.522
	Within Groups	270.756	132	2.051		
	Total	273.437	134			
Asymmetric – Symmetric	Between Groups	88.993	2	44.496	25.293	0
	Within Groups	232.222	132	1.759		
	Total	321.215	134			
Repulsive - Attractive	Between Groups	22.711	2	11.356	6.661	0.002
	Within Groups	225.022	132	1.705		
	Total	247.733	134			
Nostalgic	Between Groups	19.6	2	9.8	4.555	0.012

- Futuristic	Within Groups	284	132	2.152		
	Total	303.6	134			
Submissive - Aggressive	Between Groups	20.311	2	10.156	4.606	0.012
	Within Groups	291.022	132	2.205		
	Total	311.333	134			
Noisy - Quiet	Between Groups	0.933	2	0.467	0.21	0.81
	Within Groups	292.667	132	2.217		
	Total	293.6	134			
Immature - Mature	Between Groups	47.57	2	23.785	9.06	0
	Within Groups	346.533	132	2.625		
	Total	394.104	134			
Calm – Exciting	Between Groups	18.326	2	9.163	3.646	0.029
	Within Groups	331.778	132	2.513		
	Total	350.104	134			
Ordinary – Extraordinary	Between Groups	9.304	2	4.652	2.403	0.094
	Within Groups	255.556	132	1.936		
	Total	264.859	134			
Masculine - Feminine	Between Groups	47.57	2	23.785	11.217	0
	Within Groups	279.911	132	2.121		
	Total	327.481	134			
Unfriendly - Friendly	Between Groups	16.637	2	8.319	3.838	0.024
	Within Groups	286.133	132	2.168		
	Total	302.77	134			
Boring - Interesting	Between Groups	20.311	2	10.156	3.819	0.024
	Within Groups	351.022	132	2.659		
	Total	371.333	134			