SUSTAINABLE FASHION DEVELOPMENT:

APPLYING TRANSFORMATIONAL DESIGN

By

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"Good things take time."

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CHAPTER I: Statement of the Problem

Fashion is like the high-speed rotation of a tire. Fashion trends change frequently. Fashion is defined as styles with a specific set of aesthetic characteristics that are adopted by a group of people during a limited period of time (Ruppert-Stroescu & Hawley, 2014). Style refers to "the aesthetic and symbolic" characteristics of clothing (Cillo & Verona, 2008). Consumers purchase various fashion products due to their consumption behaviors and psychologies (Lang, Armstrong, & Brannon, 2013); specifically, consumers' express self-identity and self-emotion through purchasing different styles of clothing (Bly, Gwozdz, & Reisch, 2015; Holt, 1995; O'Cass, 2004; Wilk, 2002). Fashion apparel companies produce high quantity and various styles of products in the fashion system in order to fulfill consumers' needs and keep the companies' profits (Fraser, 2009; Hamilton, 1987; Ruppert-Stroescu & Hawley, 2014). Consequently, fashion industries have been experiencing a rise in consumption (Fraser, 2009). This excessive production causes increased "throwaway" fashion and disposal of textiles and garments, contributing to increased waste in landfills (Fraser, 2009).

Participating in the fashion system involves choice, which implies selective human behavior. Such behavior is influenced by consumers' psychological desires and social needs. For example, people represent their taste, hobbies and ways of socializing with peers by their clothing preferences (Wilk, 2002). As explained in consumer

psychology, consumers want to express their self-identity, social order, self-emotion, or fit in or stand out from others (O'Cass, 2004; Wilk, 2002). Companies constantly change their current products, which lead to the onset of fashion style change. Companies do this in order to remain successful (Ruppert-Stroescu & Hawley, 2014). In other words, the fashion industry intends to push consumers so that they purchase more clothing in order to keep up with the mainstream style change, which will eventually lead those companies to make more profit.

On the other hand, consumers are becoming more and more sensitive to fashion trends and want to change styles rapidly to keep up with the fashion environment (Lang et al., 2013). As fashion companies keep producing garments and consumers keep purchasing them, large quantities of textiles and garments are disposed. For example, every year, in Cambridge, UK, each consumer disposes an average of 30kg of clothing and textiles; similarly, Claudio reported that on average, Americans throw away 68 pound of clothing every year as as cited in Gam, Cao, Bennett, Helmkamp, and Farr (2011, p. 84). In addition, apparel overconsumption is depleting both renewable and non-renewable natural resources (Cao, Frey, Farr, & Gam, 2006).

Over time, in the fashion industry, many sustainable fashion innovations have been employed by designers to address the problems described above. The purpose of my thesis was to increase consumer's long-term relationship with clothing; to extend the use time of clothing, by providing consumers more options for diverse styles within one garment. I focused on how one garment provides consumers options for multiple styles in order to reduce the amount of "throwaway" apparel. Therefore, my research discourages the purchase of multiple separate clothing items and instead encourages purchasing few

pieces of clothing that will meet more than one stylistic need. The clothing I designed that offers more diverse styles, will be more frequently worn and may eventually lead to the user forming a durable relationship with the clothing ultimately reducing the frequency of purchases and the subsequent waste.

CHAPTER II: Summary of Surveyed Related Work

This section discusses sustainable theories and the different methods used to attain sustainability in fashion design. More specifically, the review discusses the cradle-to-cradle theory (C2C) (Gam et al., 2011), empathic design (Niinimäki & Koskinen, 2011) and design processes. In addition, I have analyzed and described select contemporary designers who transform clothing in three different ways: employing technology, integrating design details and diversifying fabric characteristics.

The Framework of Sustainable Design Theory

Under the umbrella of transformational design, the sustainable design theoretical frameworks of C2C and empathic design supported my design thesis. The concept of biological and technological metabolisms in C2C theories and the design principles of user attachment, and long-term use and product satisfaction inherent to empathic design drove the development of my transformational garment designs.

Cradle-to-cradle. In the cradle-to-cradle model (McDonough & Braungart, 2002), every substance is considered to be a "nutrient", and those are further divided into two main components: technical or biological nutrients (Chemistry, 2002; Gam et al., 2011).

The technical cycle contains materials that are not biodegradable and should be prevented from entering the environment. The materials can be continually used in technical cycles where the original state of the material is preserved (Chemistry, 2002). For example, polymer polyethylene terephthalate (PET) bottles can be recycled into monomer synthetic fibers (Byung-Wan, Park, & Cheol-Hwan, 2006). The process of transforming the relatively less-valued material (PET bottles) into a material of higher value (synthetic fiber) is defined as upcycling (Pol, 2010). The synthetic fibers can be developed into yarns, fabrics and eventually become garments. Users can wear the garments; when the users feel tired with the garments, the garments made by synthetic fibers can be broken down to be recycled again. Such synthetic garments, therefore, maintain their usefulness in a closed loop (Chemistry, 2002; McDonough & Braungart, 2002; Nederlof & Frijns, 2010). This demonstrates how a technical nutrient cycle works in the Cradle-to-cradle model.

The biological cycles include materials that can wear out in the environment. These materials can be fully biodegraded into any natural environment without using chemical materials. In addition, the organic material must have nothing negative affecting the natural environment once the organic materials are used (Chemistry, 2002). Organic cotton is one example of a biological nutrient. The growing process of organic cotton is non-toxic (Everman, 2009). In order to keep the organic state, the procedure for making organic fibers into end products should not allow the use of material that is negative for the environment. Therefore, after biodegrading organic cotton, there are no harmful substances that enter the environment. The process of how organic cotton is produced and biodegraded is an example to demonstrate how biological metabolism works in the

Cradle-to-cradle model.

Empathic design. Empathic design creates a sustainable product relationship between the product and the user. Users have complex relationships with products they own, such as emotional, spiritual, and social (McDonagh, 2006b; Niinimäki & Koskinen, 2011). Among them, "Emotions play a strong role in consumption" (Niinimäki & Koskinen, 2011, p. 166). When users feel tired of products, they are more likely to purchase new products (Niinimaki, 2010; Niinimäki & Koskinen, 2011; Wilk, 2002; Zukin & Maguire, 2004). Niinimäki and Koskinen (2011) explained two ways to build a durable relationship between the user and product: to create product attachment and to foster "long-term use and product satisfaction."

According to Niinimäki and Koskinen (2011, p. 169), "product attachment" and "long-term use and product satisfaction" are two main factors that contribute to building deeper, longer relationships between products and consumers: "consumer-product attachment is the strength of emotionally engaged experiences a user has with a product" as well as "long-term use of textiles and clothing quality, aesthetical dimensions and functionality" (Niinimäki & Koskinen, 2011, p. 173). The concept of consumer-product attachment means that the products have special or important meaning for users; thereby users want to keep the products longer (Niinimäki & Koskinen, 2011). If users have certain memories, or enjoyment related to certain products, they are more likely to keep the products longer than other products. Simultaneously, if a product has good quality, appropriate aesthetic dimensions, and functionality, consumers will want to keep it for a long time.

Two ways to help designers to enhance product attachment are co-design, in which emphasis is given towards providing users an opportunity to participate in the design process, or post-consumption participation where users express their personality by physically interacting in some way with the product (Niinimäki & Koskinen, 2011). These two ways can encourage building a durable relationship between consumers and products.

Sustainable Design Methodology Concept

The design process and the concept of transformational fashion design are introduced in the following section. The purpose is to explain these concepts that I used as a guideline to design my collection.

Design process. Setting a plan is important for realizing a product. Based on previous researchers' work and my fashion design experiences, five summarized sections contribute to the design process: define, ideate, prototype, build, and exhibit (LaBat & Sokolowski, 1999; Lamb & Kallal, 1992; Leonard & Rayport, 1997; Parsons & Campbell, 2004). The define stage clarifies who should become the target users, and narrows the design problem. The ideate stage indicates a clarification of potential target users' needs, and ways to meet those needs. This involves understanding of target users to brainstorm solutions. The mood, trend, fabric board, and sketches should be completed during ideate stage. The prototype stage can help designers to test designs that were selected in the ideation stage. When designers achieve an ideal prototype, they will make their final product. This is the fourth stage in the design process: build. The last design phase is exhibit. In this phase, designers can publish their collections (Bly et al., 2015

n.d; LaBat & Sokolowski, 1999; Lamb & Kallal, 1992; Leonard & Rayport, 1997; Parsons & Campbell, 2004).

Transformational fashion design. The concept of transformational fashion design means one garment can be transferred into at least one or more garments or related items that share certain characteristics and functions with the original garment (Gam et al., 2011; Zhen Wang et al., 2014). In other words, one piece is able to provide many options to the wearer, therefore, leading to reduction of garment purchases and consequently reducing textile waste.

Selected Contemporary Transformational Fashion Designers

This section focuses on the work of fashion designers who employed transformational methods in three different ways: employing technology, integrating design details, and diversifying fabric characteristics. The purpose of this section is to demonstrate and illustrate previous sustainable fashion development practices in order to develop my unique transformational collection.

Employing technology. Hussein Chalayan, MBE, is a British/Turkish fashion designer, who focuses on using technology to create transformational garments. In 2006, he transformed a coffee table into a wooden skirt (Sykes, 2000). Figure 1 shows the transformation of that design. The coffee table is made of different stackable layers. In the middle of the coffee table is a hole for the model to stand, and the model can pull the center layer to her waist in order for the table to become a skirt.

Figure 1. Showing how to transform from a coffee table into a skirt. Reprinted from Fall 2000 Ready-to-wear Chalayan of *Vogue*, by Sykes, 2000, retrieved from http://www.vogue.com/fashion-shows/fall-2000-ready-to-wear/chalayan

In 2007, by applying "robotics and early-stage wearable technology", Chalayan designed a line of clothes, dresses and accessories that were transformed by mechanically into different looks (Mower, 2006). Figure 2 demonstrates a transformational process of one dress in his collection. Picture A in Figure 2 is the original dress and hat. Using technology, the hemlines of the dress and the hat can move to become Picture A.1 and A.2 in Figure 2.

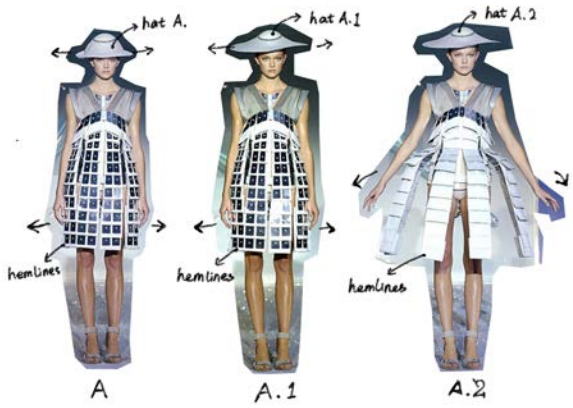

Figure 2. Showing how to transform the dress of Hussein Chalayan collection, 2007. Reprinted from Spring 2007 Ready-to-wear Chalayan of *Vogue,* by Mower, 2006,

retrieved from http://www.vogue.com/fashion-shows/spring-2007-ready-to-wear/chalayan

Integrating design details. Rad Hourani is a fashion designer from Canada who launched his transformation collection at the Fall 2010 New York fashion week. Zippers as transformational design details were applied to most of his collection. A jacket was turned into a t-shirt or a vest by zipping on or off the sleeves (Hourani, n.d). Figure 3 shows a single jacket on the runway worn three different ways. Picture A on the left side of Figure 3 is the original jacket that has zippers applied on the armholes and the sleeves. By zipping on or off the sleeves and armholes, the jacket becomes a t-shirt (Picture B) and a vest (picture C). By applying the zippers as transformational design details, the jacket can be transformed into different visual looks.

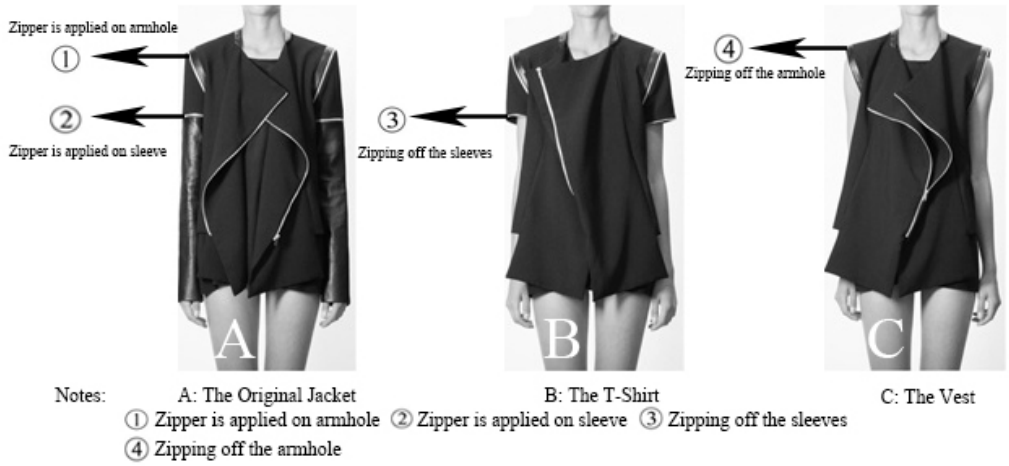

Figure 3. A transformational jacket designed by Rad Hourani, 2011 Fall. Reprinted from Transformation from *Radhourani Unisex*, n.d., retrieved from http://www.radhourani.com/blogs/news/1578812-transformation

Diversifying fabric characteristics. Susanna Gioia is a fashion designer and has her own company, Lemuria. Since 2007 she has been designing transformational clothing

by applying soft fabric that is easy to wear with multiple options (Lemuria, n.d). For example, Figure 4 shows how one dress can be transformed into five different looks. Dress A on the left side in Figure 4 is the original dress, and B, C, D, and E are different looks after transforming the original dress.

Figure 4. Five outfits transformed from one dress designed by Susanna Gioia. Reprinted from Lemuria Abito Cleopatra/Cleopatra dress of *Vimeo*, by Lemuria, 2012, retrieved from https://vimeo.com/42819905

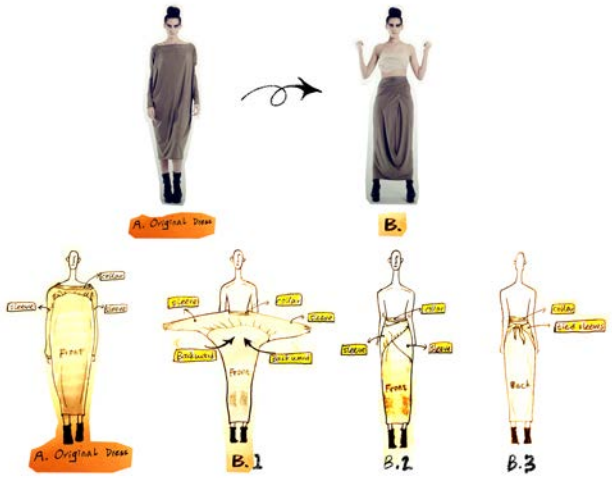

Figure 5. Demonstrating how to transform from the original dress A into the skirt B.

Because the fabric in the original dress was a knit, the original dress is stretchable. Firstly, the wearer moved the collar of the original dress to the waist (B.1); secondly, she pulled the sleeves backward to wrap around the waist (B.2) and tied the sleeves in the back (B.3). It is the first transformation process from the original dress (A) to the skirt (B).

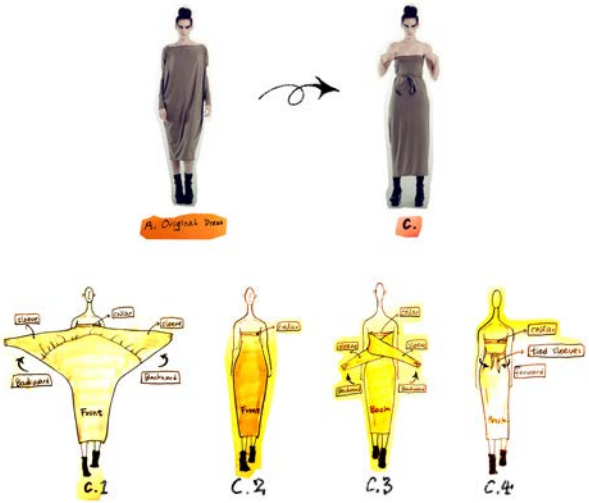

Figure 6. Demonstrating how to transform from the original dress A into dress C.

When transforming dress A into dress C, firstly, the collar of the original dress moved to the bust (C.1); secondly, the sleeves were pulled backward over the bust (C.2); next, the sleeves were crossed in the back (C.3); after the sleeves were crossed, the sleeves were tied in the front. Rotating and tying the sleeves completed the transforming process from the original dress A into dress C.

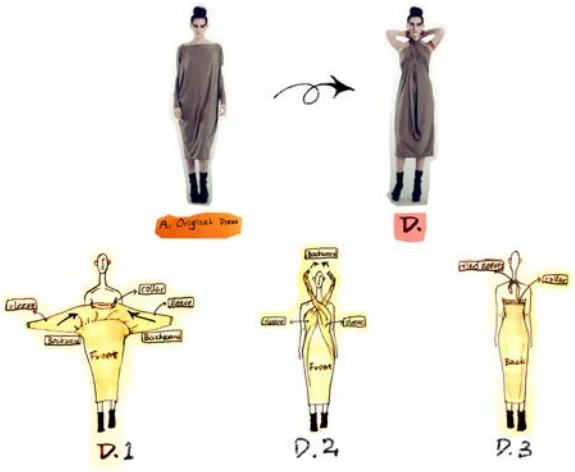

Figure 7. Demonstrating how to transform from the original dress A into dress D.

When transforming dress A into dress D, firstly, the collar of the original dress A was moved to the bust (D.1); secondly, the sleeves were crossed in front of the dress (D.2) and then passed over the neck and tie in the back of the neck (D.3). This third new look is shown in Picture D in Figure 7.

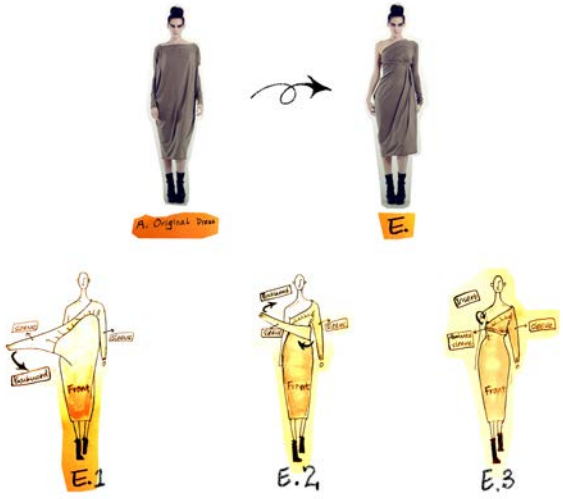

Figure 8. Demonstrating how to transform from the original dress A into dress E.

When transforming dress A into dress E, firstly, the collar of the original dress was

stretched over one shoulder and then the stretched part of the collar and the sleeve was placed under the armhole (E.1); secondly, the sleeve was passed behind the back and around to the front (E.2); thirdly, the sleeve was twisted in front of the dress and the twisted sleeve was inserted into the collar under the armhole. From E.1 to E.3, the transformation from the original dress A into dress E is shown.

From this review, we see that current fashion designers applied three transformational design methods: employing technology, integrating design details, and diversifying fabric characteristics. Each approach can provide different looks for consumers; however, the style of the garments stayed the same. For example, after transforming the dress, or hat, they still were styled as a dress, or hat just in different versions.

Design Objective

Excess garments and textiles have damaged the environment (Cao et al., 2014). Apparel companies produce more and more new items depending on constantly changing fashion trends to generate their profits. Consumers want to catch up with fashion trends, and use clothing to express their self-identity or emotion, therefore; purchasing more and more clothing is common. Due to the current fashion industry environment and consumers' psychology, the rate of utilization of each piece of clothing has decreased. In addition, unwanted clothing disposal and non-sustainable fashion development have contributed to the problem of excess garments and textiles damaging the environment. In order to solve this issue, I used second-hand jeans to develop my collection, which is in accordance with the concept of upcycling under the Cradle to Cradle theory; I created the

garments to satisfy my subjects' desires, which coincide with Empathic design; and I employed the concept of transformational design into my collection (see Figure 9).

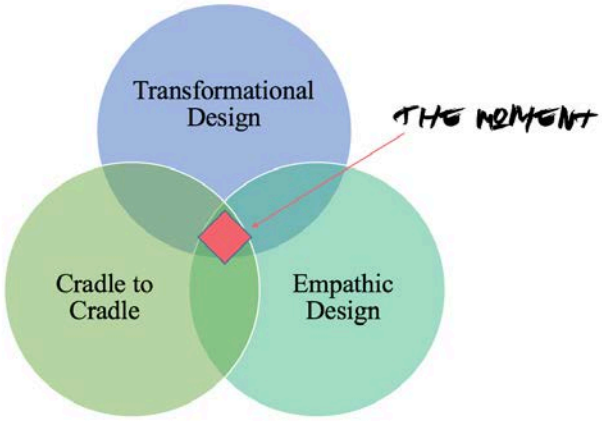

Figure 9: A visual picture of my design process

I developed my design problem statement by adopting sustainable design theory and reviewing previous transformational fashion designer practices. The concept of my thesis design collection focused on providing multiple style options for consumers, such as from girlish-style to boyish-style clothing within one transformational garment. For example, in my collection, one straight skirt can be transformed into an off-shoulder top. Consumers of my designs will not only transform the garment, but also transform the garment styles and extend end use options, for example, some pieces of garment in my collection can be transformed into bags. For me, transformational fashion design is analogous to a modular system. A modular system is often defined as functional partitions, which could be characterized into discrete scalable, reusable modules, rigorous use of well-defined modular interfaces, and making use of industry standards for interfaces (Baldwin & Clark, 2006). Each piece of each garment will easily shift in

different styles, and the users will be able to rearrange and restyle their clothing. Therefore, consumers can transform the garments by themselves, which will enhance participation and increase the frequency of using the clothing, deepening the user's relationship with their garments and fulfilling one of the essential principles of empathic design (Niinimäki & Koskinen, 2011).

Because one garment is separated into different styles, each style can be reused by consumers, therefore, each style part will reflect an analogy to the "technical nutrient[s]" in the C2C, where the materials can be continually used in technical cycles (Gam et al., 2011). In addition, to further the sustainable purpose of my work, I used second-hand jeans as fabric to develop my thesis collection. The denim can be recycled into insulation (Urbanchuk, 2011). This is in accordance with the Cradle to Cradle model, which always keeps materials in the use cycle (Gam et al., 2011). The significance of my study is that my designs will discourage garment disposal and reduce waste. The purpose of my study is to investigate sustainably focused innovation in fashion design to create apparel that builds user empathy, in addition to making fashionable, sustainable garments.

CHAPTER III: Methods: Summary for the Creative Process

This section describes my creative process that resulted in the creation of a sustainable fashion collection by applying the concept of transformational design. Four design phases were included: 1) defining, where I established the target market, 2) ideating where I sought inspiration, developed a theme, sketched, and implemented transformational methods, 3) prototyping, where I tested transformational methods, and 4) building the collection where I made apparel patterns and sewed garments.

Defining.

It is important for retailers, designers and consumer behavior educators to understand the target users (Xu & Paulins, 2005). Therefore, the first step of the creative process was to clarify the age, gender, geographic regions, salaries, habits, and behaviors of potential target consumers.

I chose to design for female college students, between 18 to 28 years old. Wolburg and Pokrywczynski (2001) noted that the college student market is an important segment within the overall marketplace, and according to Bakewell and Mitchell (2003), this market has tremendous purchasing power. For example, in 2002 in the United States,

college students spent $287 each month on apparel (Gardyn, 2002). College students have their own specific wants and needs as consumers, seeking freedom or gaining a sense of accomplishment when they are shopping (Noble, Haytko, & Phillips, 2009). Female college students have more recreational and fashion-conscious shopping orientations than males (Bakewell & Mitchell, 2003). College-aged females spend the most excess money on clothing when shopping.

To help me better understand my target user behavior and preferences, I selected the three favorite apparel brands of college females: Forever 21, Urban Outfitters, and Madewell (Cowart & Goldsmith, 2007) and spent one and a half hours in each of these three stores observing college-aged female consumers. On July 23rd, 2016, from 11am to 12:30pm, I was pretending to purchase clothing in the corner near the fitting room of the first floor of Forever 21, in a major Midwestern metropolitan area. I paid special attention to observe what kind of clothes consumers in my target market wore and purchased. I recorded my observations into my IPhone 6S note. In Forever 21, I estimated the ages of female consumers between 18 to 23 years old. They wore dark-colored tight, short crop tops, dark blue and light blue jean shorts and A-line one piece dresses with floral printing in different colors, such as red, vermeil, crimson, garnet, vitelline, ivory, olive green, forest green, and sea blue. I observed that they purchased canal blue jeans, shorts. tight-knit, and cotton dresses; some of them were in one color, some of them were colorful and vivid blue.

On the same day in the afternoon from 4 pm to 6:30 pm, I sat on a sofa to observe the female consumers in Madewell, in the same shopping mall with Forever 21. I observed women that I estimate to be aged 20 to 45 years old. I observed that female

consumers who are between 20 to 25 years-old commonly purchased moon blue or bright blue jeans, denim jeans and woven cotton lose tops in a solid color, such as powder blue, acid blue, ivory, and bright brick red, and denim or chiffon long dresses in dark colors, for example, indigo blue, navy blue, and wine berry.

On August 3rd, from 8:00 pm to 9:30 pm, I went to Urban Outfitters to observe female consumers in a major Midwestern metropolitan area. The female consumers in Urban Outfitters were more fashion-conscious than the consumer in Forever 21 and Madewell. As I observed, it seems the age of female consumers between was 18 to 28 years old. They wore nice makeup, velvet or plastic chokers, oversize ripped jeans, tight crop tops, one-color A-line dresses, and high-knee socks. I observed that they purchased white, indigo blue, navy blue, canal blue, and sea blue denim jumpsuit, ripped jeans, shorts, ivory, charcoal grey, lilac grey, and drab knit crop tops, oversize knit and cotton graphic T-shirts, and knit ivory and soft red sweaters.

In order to gain a personalized understanding of my target user's needs, I obtained permission from the Institutional Review Board (IRB) to interview two women individually. The approved IRB documents, my IRB flyers, and interview questions are attached in APPENDIX B. The two women I interviewed were both undergraduate students from a large Midwestern University; one was a marketing major, another was an apparel design and production major. The self-reported disposable income of one subject was around $300 per month, but the other had only $200 available. They both went shopping for clothing an average of four times per month; both stated that maybe they did not purchase clothing every time, but they liked to look around in the stores; they both liked shopping in thrift stores. Subject one stated that she spent more than $100 on

clothing monthly, and she did not care about the price. As long as the garment was of good quality and if it looked nice, she would buy it. Brands she liked were Dr. Martens, Birkenstock, Free People, Madewell, and Ralph Lauren. A store she liked was Nordstrom Rack. Subject two spent $20 for 20 items of clothing each shopping. She liked the clothing from thrift stores because she liked vintage clothing. Actually, both subjects liked clothing from thrift stores. Both also liked clothes that have good quality, fit well, are affordable and comfortable. For example, the subject one said:

> "l liked is flared or with fullness, but still looking stylish. I also like the clothes from thrift stores, especially some good brands with good prices."

The subject two said:

> "I like to look around in second-hand stores. I mean I do not really need to buy something, but I like to look around in there, and most of my clothing comes from thrift stores. Styles like the 1970, 80s, and 90s."

Both subjects preferred to participate in the design process; for example, subject one, who majors in apparel design and production, liked to purchase clothes from thrift stores and then change the silhouette to fit her size and style. Subject two, who majors in marketing but is a self-employed textile and apparel designer, also liked to alter her thrift store pants into shorts after she purchased them. Subject one said:

> "I love jeans, especially if they come from a thrift store, because I can change the shape by myself in order to let it fit me even better."

Subject two stated:

"I like pants and oversize T-shirt, oh! I also like to cut the pant to become a short! I like to do that."

When asked, "what is the one piece of garment that you wish you had but you do not have?" subject one wanted a Chanel jacket while subject two wanted a jumpsuit. The subject one stated:

"Well! Chanel jacket, I don't know. But I think every girl wants to have a Chanel bag."

The Subject two said:

"I always want to have a jumpsuit, the style like 1930s, 1970s, but I am too short, do you what I mean, jumpsuits are too long for me. So I always wanted to have a jumpsuit."

Both them stated that when they have to attend new activities, they want to have new clothes. The subject one said:

"Go to movie, interview, or if I saw some cool or new look from a magazine or the internet, I will go to the store to try to find them or something similar."

Subject two said:

"Starting school, trip, new job or career, yeah, something like that."

By analyzing the observation and interview data that related to my target consumer, research from refereed journals and professional trend forecasting, I reinforced my target market choice and had a better understanding of the clothing-related

preferences and behavior of female college students. Following this conceptual work, I created a visual representation of my consumer, depicted in Figure 9.

Figure 10: A consumer board of "The moment" created by Bingyue Wei, 2016.

The consumer board reflects my consumer. She could be 20 to 25 years-old, has a disposable income of $200 to $400 per month, and lives in a college town in the Midwest. She likes art and entertainment. She likes coffee and sometimes she cooks by herself and tries to stay healthy. She cares about environmental issues and tries to live sustainably, for example, taking notes directly on her computer instead of printing on paper, knowing how to classify recycled and non-recycled garbage, and avoiding the use of excessive heat or air conditioning in her home. She likes adventure. Her living space is romantic. The images of the food, landscape, and living space represent these characteristics of my consumers.

Ideating.

The second step of the creative process was to seek inspiration, develop a theme, sketch, and implement transformational methods. My inspiration spark was from a picture from a book called *Fashionable Selby* (Selby, 2014). In the picture, a bunch of buttons were placed scattered on the fabric (see Figure 11).

Figure 11: Inspiration Spark came from the book *Fashionable Selby*.

Each button could be moved easily on the fabric, which meant the buttons and the fabric could be separated. I was inspired by this idea. If each piece of a garment can be detached, I can transform these garments. By applying the concept of transformational design, the whole garment could be changed in so many ways, however, the garment would stay in one state when the consumer wears it. Therefore, I named the theme of my collection: "The Moment."

I integrated the ‘Pause” trend directions in Spring and Summer 2017 from the reliable trend forecasting source WGSN (Brannon & Divita, 2015), which provides information and services regarding fashion trends, forecasts, reports, image references, and news for apparel designers, companies, and brands to create my mood and trend boards. When researching, I created four different mood and trend boards. My advisor and I used the evaluation sheets in Appendix A to evaluate each of them to choose the finial mood and trend board. (see Figure 12 and Figure 13).

Figure 12: A mood board of "The Moment" created by Bingyue Wei, 2016.

Figure 13: A trend board of “The Moment” created by Bingyue Wei, 2016.

My mood board reflected the color story and the emotion I wanted to express. I wanted to express the emotion of freedom and beardless into my collection from my mood board. The trend board demonstrated the clothing style I want to design, such as box silhouettes, oversized pants, and fringe detail. Both them functioned as a guideline to direct and develop my designs. I decided to use second-hand jeans as fabric to develop my collection. Denim is a very important product category for my target market, and both subjects liked jeans and clothing from thrift stores. Therefore, I decided to use the jeans from second hand store as material to develop my thesis collection. Choosing the used denims aligned well with the concept of upcylcling under the cradle-to-cradle theory because old clothing got recycled and not wasted. The fabric and trim board in Figure 14 shows the denim, second-hand polyester chiffon and the eyelets that the strong in trend. The metal can be recovered into the nature by collecting, sorting into different types of metal, shredding into tiny pieces, baling, melting, and fabricating the metal into new metal materia (Tuncuk, Stazi, Akcil, Yazici, & Deveci, 2012).

Figure 14: A fabric and trim board of "The Moment" created by Bingyue Wei, 2016.

The mood, trend, and fabric boards provided me with direction and helped to develop methods of transformational fashion design. I sketched more than 80 different apparel designs (see Figure 15).

Figure 15: A part of sketches of "The Moment" created by Bingyue, 2016.

Based on the information from my target consumer and interviewees, most of style of my sketches were oversized and loose. Following "Empathic Design," which builds a strong relationship between the consumer and products (Niinimäki & Koskinen, 2011), all the designs I created corresponded to my subjects' desires. For example, I

sketched some different designs that can be alterable because subject two said she wanted a jumpsuit, however, she was too short to find a good size for her. I also designed some clothing that can transform from boyish to girlish because subject one wanted cool garment, but still cute. I made the element of ruffle that the user can remove from and add to the garment. The principle of my designs was to make pieces that can inter change.

Prototyping.

I experimented with the four transformational methods by making prototypes to test which transformational methods would work the best. Each method was explored by creating an 8" * 8" fabric swatch of 100% cotton muslin. Muslin is a basic fabric widely used to make garment samples (Conway, 1997). The four different transformational methods are pictured together in figure 16: picture 1 is snap with long bow, picture 2 is buttons, picture 3 is channel in muslin, and picture 4 is channel in denim and eyelets.

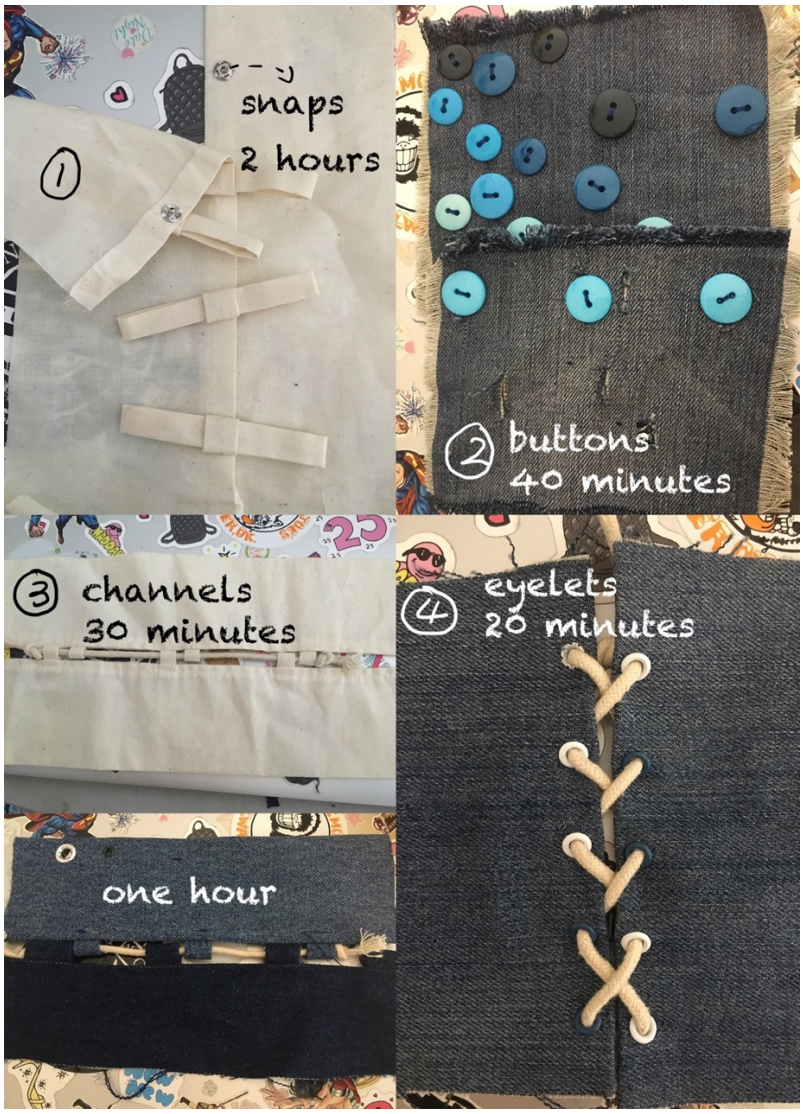

Figure 16: Four transformational methods that were tested.

As table 1 shows, the eyelets were the quickest method to be made. I personally evaluated each of the transformational methods, based on ease of use, style options, durability, aesthetic, and uniqueness (see Table 1). Considering the element of time consumption and aesthetic, I eliminated the first and second transformational methods because the snap took a long time to complete, and the buttons were not pretty like the others. I brought the third and fourth methods to my subjects. They liked both of them, however, they both thought by eyelets on denim was even better than the channels. In

addition, according to (Tuncuk et al., 2012), the metal can be recycled by collecting, sorting into different types of metal, shredding into tiny pieces, baling, melting, and fabricating into new metal material.

Name	Time	Easy to use	Style options	Durability	Aesthetic	Uniqueness	total
Snaps	1 (2 hours)	5	3	3	5	5	22
Buttons	2 (40 minutes)	3	5	3	2	5	20
Channel in muslin	3 (30 minutes)	5	3	3	5	5	24
Channel in denim	3 (1 hour)	5	3	3	5	5	24
Eyelets	5 (20minutes)	5	4	4	5	4	27

Table 1. An analysis of four transformational methods.

1=not desirable, 5= highly desirable

Therefore, the eyelets suit the sustainability model. Previously, the eyelet was used on garments without function, for example, in Fall 2016 and Spring 2016, Chanel and Each & Others applied eyelets on garment as ornament (see figure 17). I used the eyelets functionally to create interchangeable garments.

Figure 17: Eyelet references.

Therefore, I decided to use the fourth transformational method in my design collection "The Moment"., because it was the most successful method I tested and the eyelet detail is on trend.

On September 28, 2016 at 12:00 PM - 1:00 PM, in Human Sciences 336C, all my committee members reviewed my mood, trend, fabric boards, sketches, and flats. Four outfits were chosen based on appropriateness for the target market and cohesiveness of the collection (see Figure 18).

Figure 18: The styles of "The Moment" that were selected by committee members.

Building.

From September 28 to October 13, 2016, I completed more than 20 fittings under the mentorship of my advisor with my fit model. The fit model is from a large Midwestern University, and a member of my target market. Her height is 5'7″, bust is 33″, waist is 26″, and hip is 39″. Each garment had more than two muslin samples. I completed the fitting process and documented each fitting with photos of the front, back and side (see Figure 19).


style 001


style 002

Figure 19: Photo documentation of fitting throughout the thesis design collection.

After finalizing the patterns, from October 13 to 21, 2016, I sewed the patterns into final finished garments. While considering the complexity of the sewing process, I described each step with a picture in a list.

1. I collected second-hand jeans and found second-hand polyester chiffon curtain. My denim donation flyer is attached in APPENDIX C. I put a box in front of the main office of my department; I also went to Goodwill to look for more denim jeans. I used 26 pairs of jeans, 18 pairs of men's and

8 pairs of women's. 10 pairs of jeans were dark blue, 9 pairs of jeans were light blue, 5 pairs of jeans were white, and two pair of jeans were pink (see Figure 20).

Figure 20: Photo documentation of collected second-hand jeans.

2. I fit a basic pant and bodice sloper to my model in order to develop my pattern (see Figure 21).

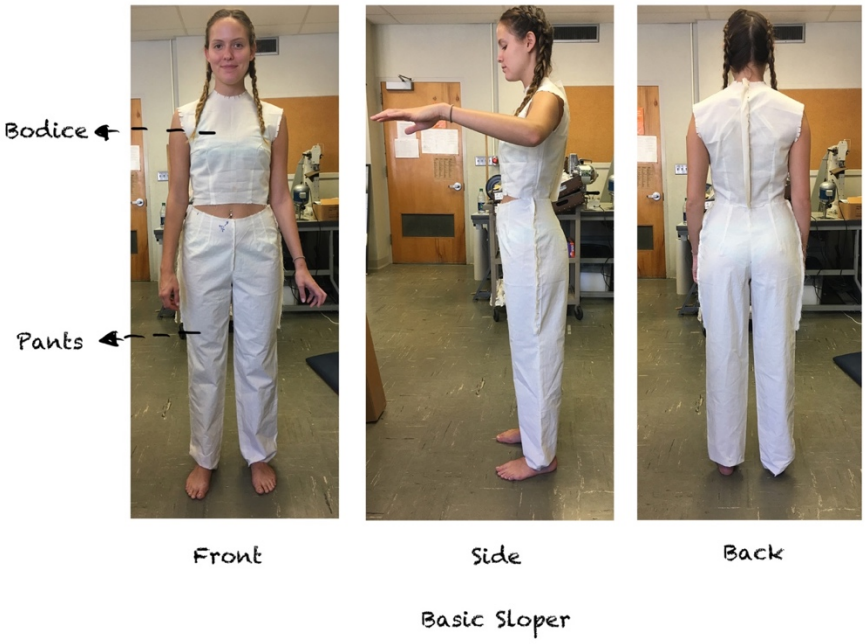

Figure 21: Photo documentation of sloper fitting.

3. I made patterns and muslin samples for each garment in my collection. I made the muslin without structure lines to get the basic silhouette. After the first fitting correction, I made the second muslin and applied eyelets. I drew color blocking lines on the muslin sample. I transferred the style lines from fabric pattern onto the paper pattern, created individual pieces, and submitted the pattern to my advisor. When the pattern was approved, I used denim to make my garment. Below is visual photo documentation of the process as it applies to style 001 (see Figure 22).

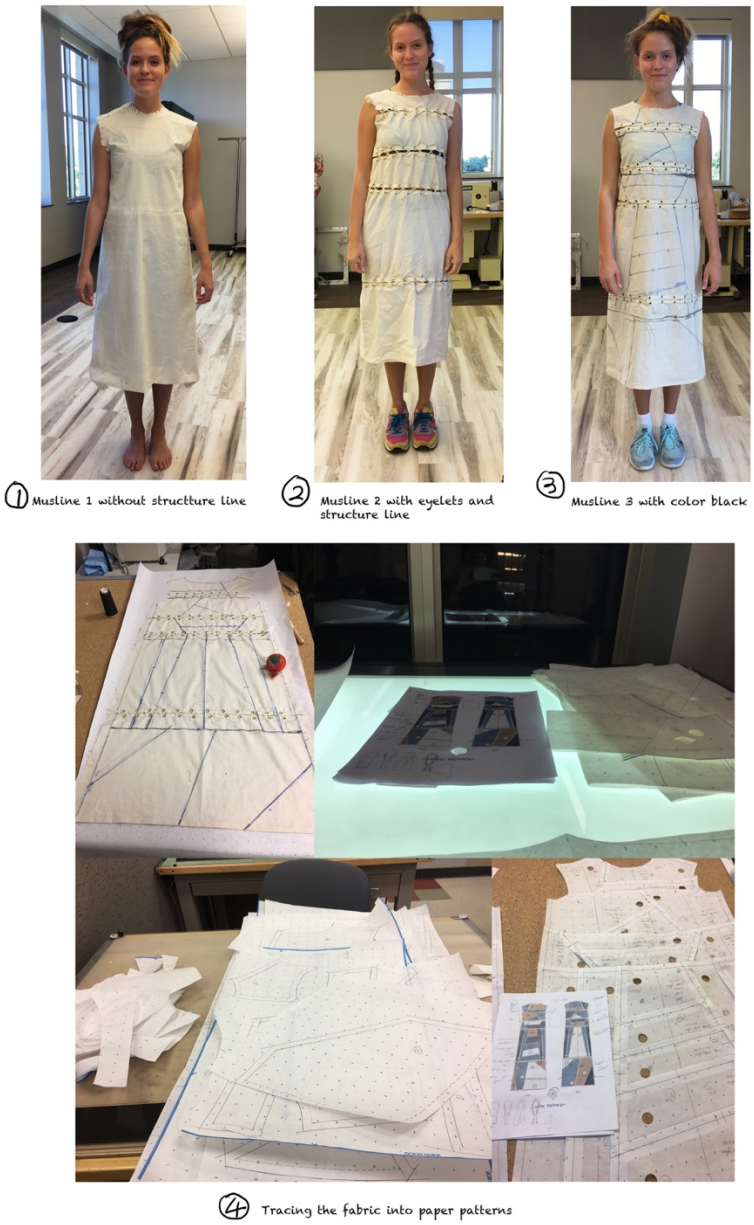

Figure 22: Photo documentation of making pattern for style 001.

4. I then put the pattern on the second-hand jeans to cut the fabric. If there was not enough fabric, I had to sew different pieces of denim together to obtain enough fabric to cut the pattern (see Figure 23).

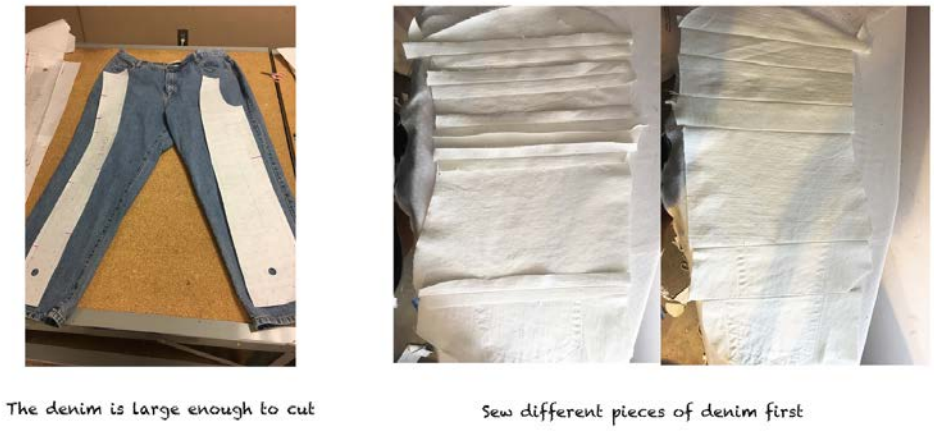

Figure 23: Photo documentation of how to cut fabric.

5. I used a JUKI 301 industrial sewing machine and a Brother home sewing machine to sew the garments.
6. On each seam, I used iron-on hem tape to make sure the inside of the garment was flat (see Figure 24).

Figure 24: Photo documentation of ironing seam allowance.

7. I used the seam ripper to make denim fringe and washed the fringe in order to make it fluffy (see Figure 25).

Figure 25: Denim fringe making process.

8. I sewed denim fringe on the edges of garment, I used the 504 three- thread overlock stitch and 301 topstitching with different colors of thread to match the dissociated denim (see Figure 26).

Figure 26: Photo documentation of 504 overlock stitch and topstitching.

9. On each pieces, I marked the eyelet position 1 inch above the hem, drew a line, and then every one inch drew a dot. Using the Hand Press Grommet Machine I inserted the fabric between the machine that was loaded with the upper and lower eyelet parts, and punched it to apply eyelets (see Figure 27).

Figure 27: Photo documentation of applying eyelets.

10. I applied eyelet for the cord to connect each piece of garment. One length of cord passes through one eyelets on the upper pieces, then one on the lower pieces, and so on until the end of the row. A knot holds the cord in place at each end of the cord (see Figure 28).

Figure 28: Photo documentation of how to pass cord through eyelets.

The analysis and discussion for each piece of garment in the collection will follow in Chapter IV.

CHAPTER IV RESULTS: ILLUSTRATIONS AND EXPLANATIONS

Based on the "Empathic Design" (Niinimäki & Koskinen, 2011), I created the transformational design collection "The Moment." The concept of the collection is to build a strong relationship between the garment and the consumer in order to encourage the consumer to keep the garment for a long time. I employed two approaches to accomplish this concept: 1. the consumer's desire to design garments; 2. increasing interaction between the consumer and the garment. The application of sustainable design theory to original apparel design is demonstrated, analyzed, and discussed in the final section.

Consumer's Desire to Design Garments I have interviewed two women from my target market. Both of my subjects liked denim and clothes from thrift stores; therefore, based on the concept of Upcycling under Cradle to Cradle theory (Cassidy & Han, 2013), I selected second-hand clothing as fabric to develop my collection.

Subject one stated that she wanted a jumpsuit, but she was too short to find one to fit her size. Therefore, I designed a jumpsuit that can change in length. According to the desire of Subject two, in which she likes clothing that looks very cool and still girlish, I

designed a detachable ruffle that can be removed from the garment by passing a cord through eyelets to accomplish the transforming process,

Increasing Interaction Between the Consumer and the Garment

The following will describe and discuss, for each garment in the collection, how the consumer can interact with each garment to change to wear it differently. The sketch, the original illustrations, the finished garments and the transforming process will be described. Each garment employs eyelets and cord to enable users to transform the garment, and each piece was designed by sewing different pieces of second-hand clothing. First, a brief description of each sketch is discussed. Second, an explanation of the process of transforming of each Style is given.

Style 001 is composed of with five main pieces: a top (A), a middle top (B), a bottom top (C), a middle skirt (D), and a bottom skirt (E) (see Figure 29).

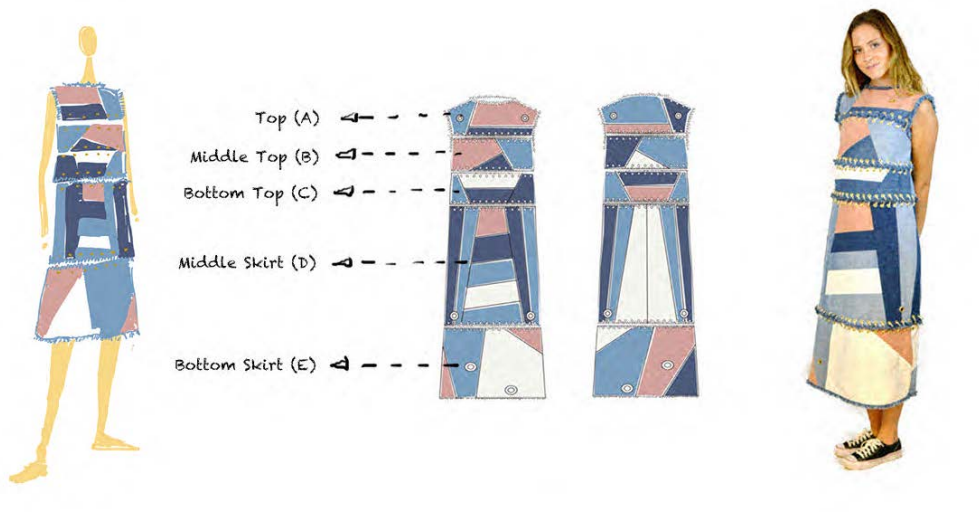

Figure 29. The illustration, flat sketch and finished garment of Style 001

By re-lacing the cord, Style 001 can be transformed and worn as seven different looks as depicted in Figure 30: middle dress (A), simple top (B), off-shoulder top (C), off-shoulder top with middle skirt (D), top with middle skirt (E), two-shoulder bag (F), and one-shoulder bag (G)

Figure 30. Transforming options for Style 001.

Style 002 is composed of three main pieces: a top (A), two sleeves (B), two ruffles (C), and a skirt (D) (see Figure 31).

Figure 31. The illustration, flat sketch and finished garment of Style 002

By joining different pieces with the cord, Style 002 can be transformed into five different looks in Figure 32: dress (A), sleeveless dress (B), sleeveless top (C), sleeveless top with skirt, and off shoulder top (E).

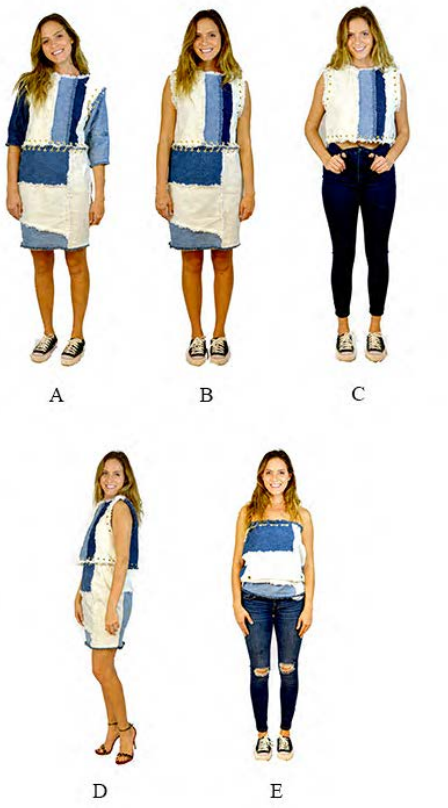

Figure 32. Transforming options for Style 002

Style 003 was a one-piece dress in Figure 33. By passing a cord through different eyelets, the ruffle can be attached on the hem or the neckless of the dress.

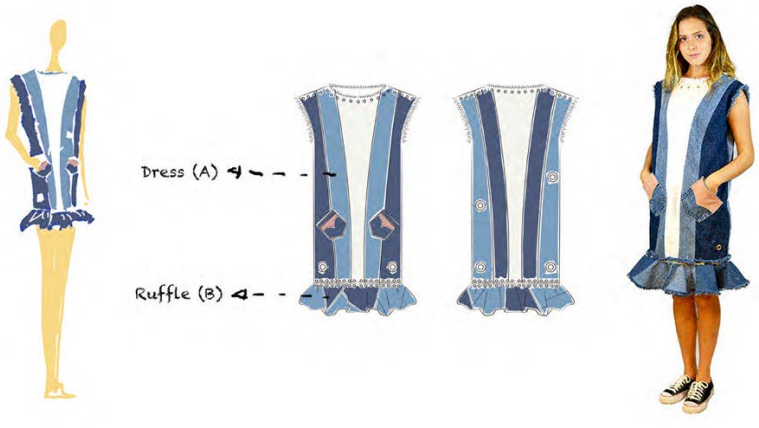

Figure 33: The illustration, flat sketch and finished garment of Style 003.

By lacing up the cord, garment 003 can be transformed into 2 different looks: the dress without ruffle (A), and the ruffle on the top of the dress (B) (see figure 34).

Figure 34. Transforming options for Style003

Garment 004 is composed of by three main pieces: a top (A), a middle top (B), and a pants (C), by passing a cotton cord through different eyelets (see Figure 35). Each piece was designed by sewing different pieces of second-hand jeans together.

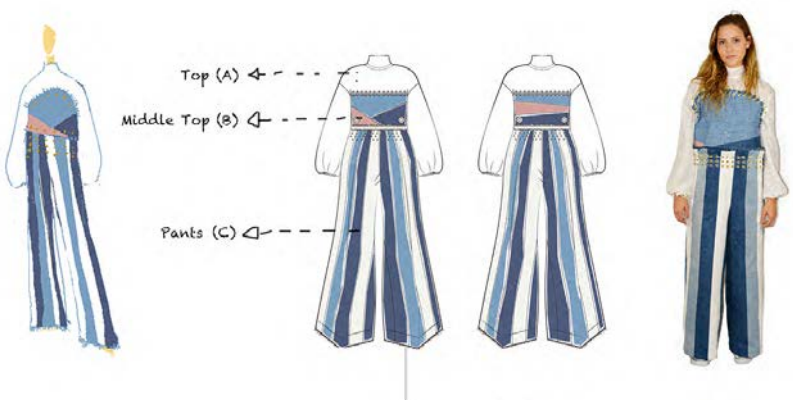

Figure 35. The illustration, flat sketch and finished garment of Style 004.

By lacing up the cord, Style 004 can be transformed into 3 different looks: top (A), pant (B), and off-shoulder jumpsuit (C) (see figure 36). Three rows of eyelets were applied on the waist of the pants, and by passing through different layers of eyelets, the size of the pants can be changed. However, the chiffon I had chosen was too light and was not good for applying eyelets.

Figure 36. Transforming options for Style 004.

Four Styles were created in my collection. Each of them included eyelets to implement transforming process. Style 001 can transform into at least six different looks, style 002 can transform five different looks, and style 003 and 004 also can transform into 3 different looks. Pieces of each style can be changed, for example, the top of Style 001 can wear with the pants of Style 004. By providing multiple options, it can increase interaction between the consumer and the garment.

CHAPTER V: CONCLUSIONS AND IMPLICATIONS

The main goals of this design thesis were to create a sustainable fashion design collection by applying the concept of transformational design where one garment can be transformed into different styles and by using clothing components that can be recycled. To achieve these goals, I used the concept of upcycling under the theory of Cradle to Cradle (Cassidy & Han, 2013) to gather unwanted second-hand jeans collected from Goodwill and donations. It is important to keep the jeans out of the landfill as the 1.5 pounds of cotton used in one pair of jeans needs a significant amount of time to biodegrade (Austin, 2007). From the whole collection, I kept the extra pieces left over after cutting and saved them for future projects. Furthermore, each piece of each garment can be separated similar to a modular system in which consumers are able to rearrange and restyle their clothing. Promoting attachments, redesigning the garment useful for on extended amount time. If consumer does decide to remove garment from hem waddle, the materials will be able to continue in the use cycle, for example, metal eyelets were applied to the clothing to assist in the transformational process. According to (Tuncuk et al., 2012), a metal can be recycled by collecting, sorting into different types of metal, shredding into tiny pieces, baling, melting, and fabricating the metal into new metal material. Therefore, the eyelets suit the sustainability model. In addition, the denim, can be recycled into insulation (Urbanchuk, 2011). This is in accordance with the Cradle to Cradle model, which is keep

materials in the use cycle (Gam et al., 2011).

The pieces of each garment in the collection could be transformed into different styles of clothing. For example, in style 001, the middle skirt could be changed into an off-shoulder top; for style 004, the ruffle could be attached at the bottom or the top of the original dress. The transformation can change from a simple, practical style to a romantic, fashionable style or a modest consociation style can change into an essay revealing style. In addition, some skirts and sleeves could be transformed into bags thereby extending the end use of the item.

To further promote sustainability, the concept of "Empathic Design" (McDonagh, 2006a; Niinimäki & Koskinen, 2011) was instrumental to my process. The purpose of Empathic Design is to keep the product in the use cycle for a long time (Niinimäki & Koskinen, 2011), by giving the consumer more interactions with, and therefore greater memories of, the product. I followed my subjects' desires in my designs, changing the lengths, sizes, and the styles of garments as they wished, providing the consumer with possibilities of transformation promoting a greater sense of interaction, freedom, and creativity. Thus, the relationship between consumer and product will be strengthened (Niinimäki & Koskinen, 2011).

The specific transformational method of my thesis collection was to separate each piece of the garment. For example, instead of sewing a sleeve with a bodice together, I used a cord to connect the sleeve and the bodice by passing the cotton cord over and through the eyelets. For example, using this method, the long dress (style 001) can be transformed into three different lengths, meaning the consumer can have different styles

by owning only one garment, therefore increasing the use and relevance of the garment, and decreasing consumption of new item of clothing.

One design detail was to sew denim fringe on each edge piece of the garments. The denim fringe fulfilled two functions: 1) to give the consumer a new experience in using denim, which can become fluffy and lighter in color after washing, and 2) to cover the skin with the denim fringe when using a cord passing through the eyelets. The other design detail was eyelet and cord to attach the pieces. I went back to my subjects to receive their feedback about my thesis collection, both of them liked the designs very much. For example, the first subject said:

> "I mean, I like it. It's easy to lace up, so soft on the inside, not rough from the denim. Also, the eyelets are large enough for lace to go through with ease. It is a very crisp seam! It can hide my skin; it won't show my body! I love it!! I will definitely wear it!!"

The second subject was also satisfied:

> "How did you do the seam? That's so cool! I like it so much!"

The garments I made for my research break the traditional relationship between the garment and the consumer. Typically, consumers passively accepted garments from the market. Consumers usually have different looks by styling different items of garments; however, not have or change into different looks or styles with only one garment. Therefore, if the consumer has the ability to transform a garment simply by changing cording in eyelets, it builds a strong relationship between the consumer and the garment.

Wearing something stylish that they helped to make themselves has the potential to give far greater satisfaction to the consumers than putting on something readymade.

Limitation

One limitation of this transformational method is the time it takes. For example, users need 10–15 minutes to transform the long dress (style 001) into the top. Initial reactions, though, show that different people have different opinions. Some people stated that they would not want to change the dress like this. Others said they like the garment and the options to change very much. For example, one person stated, "I will not want to have or wear it. I know, this is cool, but it takes me too much time. I am not that kind of person. I mean, I don't have a lot of patience." Another person was more positive, stating, "I will definitely wear it! I mean, yeah, this is true, it takes time. But it is worth taking time to make new styles because it is so cute and fashionable."

Future study

For further study, evaluating the garments using a larger sample and documenting the different ways actual users want to interchange the garments would provide valuable insight into the collection. In addition, understanding real user's time consumption, and discovering whether connect different pieces of clothing together, increases the consumer's creativity would be beneficial

Possible suggestions for further research using eyelets to transform garments is to consider the weight of the fabric. The designer should consider the carrying capacity between eyelets and fabric. For example, style 003, the jumpsuit pant was heavier than the top. The whole look became weighted down. Further exploration could consider other

fabrics and ways to fasten that look nicely and save time in the transforming stage. For example, the polyester chiffon I had chosen for the top was too light and was not good when applying eyelets. In order to reduce the time necessary to pass the cord through the eyelets, the designer could adjust the distance between each hole and/or the size of each hole. Completely eliminating the eyelets and implementing one of the other transformational techniques, such as the loop and cord system, might also result in a product that is quickly transformable.

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APPENDIX A

Consumer/Mood/ Trend/Fabric Board Evaluation Criterion
Aesthetics Met: (20)

1. **Unity**

   ____The Board successfully demonstrates design principle elements, such as unity, proximity, repetition, variety, and continuation. (4)

2. **Scale & Proportion**

   ____The Board successfully demonstrates design principles of scale and proportion. (4)

3. **Balance & Emphasis**

   ____ The Board successfully demonstrates balance of positive/negative space. (4)

4. **Color**

   ____The Board successfully shows color unity. (4)

5. **Rhythm**

   ____The Board successfully demonstrates design principles of rhythm. (4)

Functionality Met: (20)

1. ____The Board successfully includes the theme of related information, such as: fashion market, fashion trend, and inspirational elements. (4)

2. ____The Board is successfully clear and fun. (4)

3. ____The Board successfully drives people to comment back regarding the designer's theme. (4)

4. ____The Board successfully provides people a visual guide regarding the designer's theme. (4)

5. ____The Board successfully drives people to jump right at the idea regarding the designer's theme. (4)

Quality Met: (10)

1. ____The Board is neat and well-crafted with appropriate use of printing. (5)

2. ____The qualities of printing images used in the Board are good. (5)

Sketches, Transformational Method, and Muslin Sample Evaluation Criterion

Aesthetics Met (Sketches): (20)

1. **Unity**

   ____The sketch garment demonstrates design principle elements, such as unity, proximity, repetition, variety, continuation. (4)

2. **Scale & Proportion**

   ____The sketch garment successfully demonstrates design principles of scale and proportion. (4)

3. **Balance & Emphasis**

   ____The sketch garment successfully demonstrates balance of positive/negative space. (4)

4. **Color**

   ____The sketch garment successfully shows color unity that fits in the color set of the Mood Board. (4)

5. **Rhythm**

   ____The sketch garment successfully demonstrates design principles of rhythm. (4)

Functionality Met (Transformational Methods): (20)

1. ____The transformational method saves time to transform. (5)
2. ____The transformational method is practical to transform. (5)
3. ____The transformational method provides multiple styling options to transform. (5)
4. ____The transformational method is fun and unique. (5)

Quality Met (Muslin Sample): (10)

1. ____The sample is sewn neat and is well-crafted with appropriate technology. (2)
2. ____The sample is durable in wearing during the transformational process. (2)
3. ____The sample is stable while laundering (dimensional, material and color stability) and has a high manufacturing quality. (2)
4. ____The sample is graceful and appropriate. (2)
5. ____The sample is convenient and easy to keep (ironing, washing, and folding). (2)

APPENDIX B

Institutional Review Board (IRB)

Oklahoma State University Institutional Review Board

Date:	Tuesday, August 23, 2016
IRB Application No	HE1652
Proposal Title:	Sustainable fashion development: By applying the concept of transformational design
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 8/22/2019

Principal Investigator(s):

Bingyue Alisa Wei
431 HS
Stillwater, OK 74078

Mary Ruppert-Stroescu
431 Human Sciences
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

- The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Scott Hall (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Hugh Crethar, Chair
Institutional Review Board

PARTICIPANT RIGHTS:
I understand that my participation is voluntary, that there is no penalty for refusal to participate, and that I am free to withdraw my consent and participation in this project at any time, without penalty.

CONSENT DOCUMENTATION:
I have been fully informed about the procedures listed here. I am aware of what I will be asked to do and of the benefits of my participation. I also understand the following statements:
I affirm that I am 18 years of age or older.
I have read and fully understand this consent form. I sign it freely and voluntarily. A copy of this form will be given to me. I hereby give permission for my participation in this study.

_____ _____
Signature of Participant Date

I certify that I have personally explained this document before requesting that the participant sign it.

_____ _____
Signature of Researcher Date

ADULT CONSENT FORM
OKLAHOMA STATE UNIVERSITY

PROJECT TITLE:
Sustainable fashion development: by applying the concept of transformational design

INVESTIGATORS:
Bingyue Wei, Master Degree, Human Sciences, Design, Housing and Merchandising Department, Apparel Design and Production

PURPOSE:
This study is going to develop a sustainable fashion design collection by applying the concept of transformational design. I will address the problem of overconsumption by creating garments that can provide more stylistic options for consumers. This will build a durable relationship between the consumers and their clothing, which will reduce the frequency of purchase.
Participants are involved to help the researcher understand the chosen market preferences and behaviors.

PROCEDURES:
The interview will last 20-30 minutes. Participants will answer several questions about clothing preference and purchase behaviors during the interview. During my interview process, I will photograph and/or sketch to record my observation data. The participants will be contacted once more after the initial sessions in order to provide feedback on my completed sketches. The follow-up sketch review will last 20 – 30 minutes.

RISKS OF PARTICIPATION:
There are no known risks associated with this project, which are greater than those ordinarily encountered in daily life.

BENEFITS OF PARTICIPATION:
There are no direct benefits to you. However, you may gain an appreciation and understanding of how research is conducted.

CONFIDENTIALITY:
The records of this study will be kept private. Any written results will discuss group findings and will not include information that will identify you. Research records will be stored on a password protected computer in a locked office and only researchers and individuals responsible for research oversight will have access to the records.

COMPENSATION:
No compensation will be offered for your participation.

CONTACTS:
You may contact any of the researchers at the following addresses and phone numbers, should you desire to discuss your participation in the study and/or request information about the results of the study:
Bingyue Wei, Master degree student, Human Sciences, Design, Housing and Merchandising Department, Oklahoma State University, Stillwater, OK, 74078, (405) 612 9969, bingyue.wei@okstate.edu.
Mary Ruppert-Stroescu, Assistant Professor of Apparel Design and Textile Science, 438 Human Sciences, Stillwater, OK, 74078, 405-744-3819, Fax: 405-744-6910, mary.ruppert-stroescu@okstate.edu
If you have questions about your rights as a research volunteer, you may contact the IRB Office at 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

Interview Questions for Consumer Representatives

Questions:

1. Age:
2. Gender:
3. Education level:
4. Occupation:
5. Monthly income:
6. How much do you spend on clothes each month?
7. How often do you go shopping for clothes?
8. What brands do you normally buy and wear?
9. What is your favorite piece of clothes you normally wear? What make this special? What features stand out to you?
10. What is the one piece of garment that you wish you had but you do not have?
11. Provide a moment or situation that makes you most want to go to buy new clothes?
12. If you have a chance to design a garment for yourself, what kind of designs you will like? For example, what kind of details, silhouette, or fabric?

APPENDIX C

Donation denim poster

VITA

Bingyue Wei

Candidate for the Degree of

Master of Science

Thesis: SUSTAINABLE FASHION DEVELOPMENT:

APPLYING TRANSFORMATIONAL DESIGN

Major Field: Design, Housing and Merchandising with Option in Apparel Design

Biographical:

Education:

Completed the requirements for the Master of Science Design, Housing and Merchandising at Oklahoma State University, Stillwater, Oklahoma in December 2016.

Completed the requirements for the Bachelor of Arts in Fashion Design and Production at Shandong University of Art and Design, Jinan, Shandong/China in 2016.

Experience: Graduate Teaching Assistant for Design Theory (DHM 1003)

Graduate Teaching Assistant for Textiles Design (DHM 2573)

Graduate Research Assistant for Dept. of Design, Housing and

Merchandising (2015 – 2016)

Intern for ROCHAMBEAU

(New York, 05/15 – 08/15)

Intern for DMA Dawn Mayo & Associates Showroom

(New York, 05/15 – 08/15)

Professional Memberships: Social Chair for GPSGA (Graduate and Professional Student Government Association) (04/2016 – Present)