CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

UPCYCOUTURE

SUSTAINABILITY IN FASHION: UPCYCLING WEDDING DRESSES

A graduate thesis submitted in partial fulfillment of the requirements

For the degree of Master of Science in

Family and Consumer Sciences

By

Talene Lynn Karkazian

May 2016

The Thesis of Talene Lynn Karkazian is approved:

_____	_____
Professor Dr. Hira Cho	Date
_____	_____
Professor Rodica Kohn	Date
_____	_____
Professor Dr. Wei Cao, Chair	Date

California State University, Northridge

Acknowledgements

First, I would like to acknowledge and graciously thank my committee members as they have been very patient throughout this entire creative process. I would like to acknowledge the following people who were very influential: Dr. Terri Mathis, for her creative writing guidance; my mother and aunt, Susan Karkazian and Diana Rowe, for their love and dress donations. I would like to especially thank my future mother in law, Dr. Pouran Nowzari, for her love, help, patience and support throughout this entire thesis. I would like to acknowledge my fiancé, Dr. Bahram Sohrabi, for his absolute love, positive support and humor that got me through graduate school.

Dedications

I would like to dedicate this thesis to my ancestors, grandparents, parents and especially to my grandmother Martha Karkazian. She was the most amazing tailor, and everyone has always spoken so highly of her work. I was inspired to upcycle wedding dresses because my grandmother made everyone's wedding dress from the village of Ainjar, Lebanon. During the time of war in Lebanon, in the 1970's, nothing was accessible, yet she still found ways to make my aunts' wedding dresses with materials at hand. After my grandmother passed, this story resonated with me, and I realized that she was an upcycling pioneer. I wanted to write a thesis that had more meaning behind it, and hope that I have made her proud. I was lucky to have two amazing grandmothers who loved me very much, and am still so lucky to have my 96 year old grandfather, Movses Karkazian, in my life! He somehow still beats me at backgammon, will never retire from working, always has a smile on his face and has built an entire business out of farming, in addition to making roejeeg and bottling his own grape leaves. He always says this in Armenian, "I am so lucky because I am so rich. Do you know why I am so rich? Because I am rich with family. Family is the most important thing, and I would be nothing and poor without it". His wife was Martha, and he still talks about how much he still loves and misses her every day.

Table of Contents

List of Figures

Abstract

UPCYCOUTURE

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The purpose of this thesis is to develop a wedding dress collection by using the upcycling technique in order to be profitable, marketable and sustainable without creating waste. This thesis defines and analyzes fashion industry waste, sustainable methods and techniques, along with addressing the impact fast fashion waste has on humans, the environment and landfills. In regards to sustainable design, the upcycling technique is the least wasteful, as it involves transforming discarded dresses, textiles and materials into items of higher value or worth. In terms of price and use, wedding dresses are the most wasteful garments in the fashion industry. Discarded wedding dresses end up in landfills, which is why the researcher developed a wedding dress collection, by upcycling two discarded dresses and using only discarded textiles. *Upcycouture* (upcycled couture), was displayed at CSUN's annual fashion show in spring 2016. This collection was revealed at the fashion show, and was professionally evaluated by design

professionals, who provided their comments and suggestions. The researcher used only discarded items, which was a limitation. The purpose of this thesis was to create social awareness about fast fashion waste, and in turn, encourage the practice of sustainability.

Chapter 1 – Introduction to Fashion Industry

With good intentions, Americans have jumped head-on into reusing, repurposing and recycling programs; however, the sheer volume of discarded goods has become a serious problem in the United States. This problem affects the fashion industry in general and the wedding industry in particular. An estimated 2.3 million weddings were performed in the United States in 2003 (Geary, 2005). The wedding dress, one of the biggest expenditures a bride can make, is also one of the most wasteful. The purpose of this project is to develop a wedding dress collection that is profitable, marketable and sustainable by using upcycling techniques.

Background of the Study

The significance of the wedding dress is illustrated by the increase in the number of weddings (Geary, 2015), in addition to the cost and importance associated with the dress (Hicken, 2013). While individual fashion expression remains an integral part of today's society, fast fashion has become a dominating factor that poses as a barrier towards creating a more sustainable environment (Cataldi, Dickson, & Grover, 2010). Cataldi, Dickson, & Grover have discussed and explored initiatives in the fashion industry and found that consumer awareness, over sustainable fashion, is still relatively low (2010). Recently, the concept of upcycling has been seen in many fashion shows and big brands, as more awareness is being created from this concept (Sheffield Hallam University, 2011; Menkes, 2011; Cain, 2014).

Crabbe termed upcycling as a responsible design whereby the focus is mainly on finding new uses and functions using waste consumer products (2012). The concept of upcycling and sustainability share a positive relationship because the process actually helps to increase inhabitable environment uploaded of too much wastage.

According to Romero and Korkiakoski (2014), the cycle of a fashion garment begins with the conception of idea (design), the production of the cloth, the distribution, the use and end of usage when its worn (Gwilt, 2014). Upcycling is a process that continues after the use phase, by designing and upgrading a textile or garment with aims to create something that is more valuable to consumers, that creates the usage of the product again (Payne, 2011). In other words, According to Fletcher (2008), an upcycled garment consumes up to twenty times lower resources than making a new garment, which impacts the environment positively rather than negatively.

Although recycling is a more popular approach, it tends to degrade the quality of a product over time (Thorstensson, 2011). In the case of textiles, a piece of clothing is often given to charity, or it is passed on for people to use, which eventually leads to the degradation of the quality of cloth over time. Contrarily, upcycling is a better approach since the main idea is to reuse the material by increasing or maintaining the quality of the cloth. Leading to a more sustainable approach, Braungart & McDonough found that waste could be reduced drastically over time. Fiber production, textile and garment manufacturing will further illustrate the need for upcycling as a visible alternative (2003).

Fiber production is the process of growing fiber crops on large plots of land (Fletcher and Grose, 2014). Zaroff found that cotton is currently the biggest form of textile waste, representing nearly half the total fiber used to make clothing today (2015).

Extreme volumes of water, oil and electricity are used for producing fibers (Fletcher & Grose, 2015). Not only is this process wasteful, it poisons people, water and the land surrounding the area of fiber production. In order to protect the plant, farmers spray the fiber with chemicals (e.g., pesticides and insecticides). To prevent genetically adapted infestations, stronger chemicals are constantly added to the current formula which contaminates the surrounding land and water even more. These chemicals are so dangerous they cause approximately three million poisonings each year, which in turn, results in 20,000 deaths worldwide (Fletcher & Grose, 2012). The most sustainable approach for this problem would be designing with organic textiles with fibers that have not been sprayed with pesticides and insecticides. The downside here is that some organic cotton fibers can be unsustainable as it requires more water and heat than regular cotton.

Textile Manufacturing is the process of transforming fibers into textiles. This process consumes vast amounts of water and energy. Fibers are cleaned, spun into yarn, and finally taken through specialty machines that weave or knit the yarn and subsequently convert it into a textile. Textiles are taken through the finishing process, which include methods like heavy bleaching, shrinking and the use of toxic dyes and various other chemicals. The finishing process produces high volumes of toxic waste that contaminate people, crop and water. The unsustainable methods used in textile manufacturing are linked to birth defects, sicknesses and death in the areas that surround the production. Although these chemicals have direct effects on overseas workers, the consumers who purchase these materials can be affected through the garments' manufacturing process (Morgan, 2015).

On a positive note, natural dyes can be a sustainable alternative as dyes are derived from insects or plants. Natural dyes are safe, in terms of replacing the toxic synthetic dyes used in textiles. However, natural dyeing methods take longer, use more water and heat, and can be unsustainable by carrying the chemicals from the fiber production process to the consumer (Barraco, Roberti & North, 2010).

During the 1960s, Americans were still making 95% of their clothing; today we only make about three percent, as the other 97% is presently outsourced to developing countries around the world. Garment manufacturing, the process of transforming a textile into a garment, currently employs over 40 million people worldwide (Morgan, 2015). The pattern cutting process produces a considerable amount of textile waste that is not biodegradable (McDonough & Braungart, 2012). Not following the stringent American labor laws, each year these overseas factory workers are presented with poor working conditions that injure, disable or kill them (Morgan, 2015).

The rate of waste has increased since the birth of *fast fashion*. This contemporary term is used by fashion retailers to express the rapid movement of fashion collections being created and shipped to stores within two weeks or less (Minney, 2010). Fast fashion was developed with the desire to push product through faster. In turn, retailers generate more waste than ever before. According to Winge (2008), this caused consumers to discard their clothing at a faster rate, which will mostly end up in toxic landfills. Many people, living near landfills, used discarded textiles to help ignite fires that kept them warm. This may seem sustainable, but in reality it is highly toxic to the environment and to humans. Chemicals, dyes and materials used to create a fast fashion products were never meant to be used for burning (Morgan, 2015).

As the fast fashion industry keeps polluting, designers and activists keep trying to find more sustainable ways to help or maintain the earth. Currently, there are many sustainable methods that can help reduce or prevent fast fashion, but at varying degrees. The Reduce, Reuse, Recycle hierarchy was introduced to consumers—as the name implies—to reduce, reuse or recycle anything that created more waste and pollution. This hierarchy is widely known to consumers as a positive outlook; however, this was only meant to be a temporary solution, with the goal being to help reduce waste and pollution (Braungart & McDonough, 2002). Recently, there have been more sustainable approaches to the Reduce, Reuse, Recycle hierarchy like Fair Trade, zero waste, repurposing and upcycling.

Fair Trade is a social movement whose goal is helping producers—in developing countries—achieve healthier and safer trading conditions as well as to promote sustainability (Minney, 2010). Zero-Waste is a method used in the pattern cutting process, which applies the most efficient use of pattern cutting in order to eliminate or decrease material waste (Benson & Stephens, 2009). Repurposing is the practice of refurbishing or restoring products, with aims to bring value back to its original state (McDonough & Braungart, 2002). Upcycling is a practice used to bring more value to a product or textile that is, or will be, discarded. Most materials used in upcycling are discarded or salvaged. Yet, not all upcycled clothing is limited to only discarded or salvaged textiles (Benson & Stephens, 2009).

Upcycling is a process that continues after the use phase, by upgrading the material or garment to create something that is more valuable than that of its original

state. In turn, this creates the usage of the same product in a more efficient way (Payne, 2011).

This project focuses on the concept of upcycling three wedding dresses as a way to reduce waste, since most wedding dresses are often only used once. Therefore, by applying the concept of upcycling, it is hoped that the researcher can recreate a new dress using materials that are no longer needed or used. Moreover, it is vital for change to take place in order to manage the devastating amount of waste created (Katie, 2008). By upcycling a collection of wedding dresses, not only will sustainability be promoted, but it will prevent another wedding dress from being wasted or ending up in a landfill.

Problem Statement

One of the key challenges today is the issue of resource degradation and climate change (Thorstensson, 2011). The high rate of discarded clothing, garments and other forms of textiles on an annual basis contributes to more than ten percent of the total waste collected in landfills nationally (Bennet, 2012 & McCaster, 2012). Consequently, there is a need to adapt to more environmentally friendly measures, especially for the fashion industry that highly relies on resources to use as material fabrics. As the cotton resource decreases and demand for product grows this causes brands to use lower quality cotton (Barraco, Roberti & North, 2010). On the other hand, Morgan and Birtwistle (2009) state that there has been a shift of perception in consumers' buying behavior, especially with regards to the increase interest in eco-friendly products. As consumers become more aware of how products are manufactured, they are willing to reject products that exploit people and resources. Although there is a rise in consumer awareness and a wiliness to purchase eco-friendly products, there are some still manipulated by the lower prices

(Beard, 2008). Since fashionable clothes at lower prices are in high demand, the fashion industry caters to this market (Thorstensson, 2011). However, the production of lower quality clothing results in a decrease in the longevity of the garments' lifespan. With the decline in resources, fashion waste and pollution is a serious issue that needs to be addressed.

There is also an increase in overconsumption, whereby consumers are constantly buying new clothes in order to feel satisfied (Thorstensson, 2011). Upcycling helps to create a product that may satisfy the needs of more than one consumer, and a process that may continue over time (Braungart & McDonough, 2002). For instance, a wedding dress that is passed on from one generation to another can be upcycled to suit the latter's need for latest trends from the industry. This creates newer designs using the same material, and at the same time makes the consumer happy while reducing wastage. Upcycling is the best option for this issue, as it reuses the product into one more desirable.

Purpose of the Study

The purpose of this project is to develop a wedding dress collection by using the upcycling technique in order to be profitable, marketable and sustainable. The main focus is on the concept of upcycling wedding dresses as a way to reduce waste. Most wedding dresses are expensive and often only used once, resulting in waste. Moreover, it is vital for change to take place in order to cope with the devastating amount of waste created particularly when one considers what goes into a weddings (Katie, 2008). Therefore, it will be ideal to upcycle discarded wedding dresses into couture, fashionable and desirable gowns that one could use more than once.

Research Questions

1. Can upcycling be used as a sustainable approach?
2. Is upcycling the most sustainable method to reduce wastage of wedding dresses?
3. Will upcycling be a new and sustainable trend in the wedding industry?

Research Objectives

1. To investigate current upcycling techniques and approaches used in the fashion industry today.
2. To develop a sustainable wedding dress collection using upcycling methods.
3. To analyze whether upcycling will be a trend that will continue to stay constant in the wedding dress industry.

Definitions of Terms

Terminology used in this research project is described below:

RRR: An abbreviation for the Reuse, Reduce, Recycle hierarchy method, introduced in the 1990s with aims to help reduce or slow down environmental pollutants caused by humans. It was communicated as a picture of three arrows forming a circle, stating the phrase *Reduce*, *Reuse* and *Recycle*.

Organic Relating to a product that is solely made from plants or insects. Organic materials and products often carry certifications according to the industry (Benson & Stephens, 2009)

Organic Textiles: are fibers that have not been sprayed with any toxic chemicals like pesticides, insecticides, and formaldehyde, etc.

Zero-Waste is a process that reduces or eliminates waste at its source or reduces the amount of toxicity from waste (Benson & Stephens, 2009).

Zero-Waste Pattern Cutting: a method used in the pattern cutting process, which applies the most efficient use of pattern cutting in order to eliminate or decrease material waste.

Repurposing: the practice of refurbishing or restoring products, with aims to bring value back to its original state.

Upcycling is a practice used to bring more value to a product or textile that would have otherwise been discarded. Most materials used in upcycling are undesirable and are used for a purpose other than its original use, thus giving it more worth and value than that of its original state (Benson & Stephens, 2009).

Up-cycouture: the combination, and practice of, upcycling something that transforms into a high quality design that would be considered couture.

Post-Consumer Refers to the recycled material that was first used by a consumer. A high post-consumer content helps deter materials from ending up in landfills (Benson and Stephens, 2009).

PCR Clothing An abbreviation of Post-Consumer Recycled clothing (Young, Jurisk and Ashdown, 2008).

Sustainability A general term that often refers to actions and products meeting current needs without sacrificing the ability of future needs being met.

Eco-friendly products that are created with keeping the ecology and environment in mind (Benson and Stephens, 2009).

Fair Trade A social movement, promoting standards for international labor through fair wages and safe employment opportunities to underdeveloped countries (Minney, 2011).

Recyclable Materials that can be converted back into a similar material, which can then be used in manufacturing new goods or materials**.**

Non Toxic specifically meaning not poisonous (Benson & Stephens, 2009).

Chapter 2 – Review of Literature

The purpose of this project is to develop a wedding dress collection that is profitable, marketable and sustainable by using the upcycling technique. According to Geary (2003) the wedding gown industry has increased significantly over the years and because gowns are only worn once, they pose a problem to globe waste. Upcycling could be the answer. This technique uses materials that was quite possibly only worn once and at some point might have entered a landfill, thus polluting our earth. Through upcycling a new design is created from older fabric and accessories.

Fashion Industry Waste

Brule (2008) considered fast fashion apparel as the biggest and fastest growing form of waste and pollution in the world. Typically, consumers were unaware of the damaging effects of the clothes they wore, hence posing fewer questions in regards to the manufacturing of those clothes (Petit, 2007). There appeared to be an increase in consumers' awareness of the ethical aspect of their purchase decisions and fashion brands were attempted to adapt the ideas of sustainability. Beard (2008) pointed out, however, consumers were habitually attracted to buying cheaper clothing, even if it was not environmentally or humanely safe.

In 2006, consumer spending for recycles and organic clothes rose to approximately 80%, meaning there was an increase in eco-fashion. Due to the increase in all things vintage, second-hand items and vintage clothing also gained popularity. In the past, second-hand clothing was only for the poor. The appeal had changed and had become a mass culture in the fashion industry. People were similarly interested in

individual and unusual pieces of dresses and clothing, since this would make them unique in society. Therefore, this eco-fashion created exclusiveness (Brule, 2008).

One of the key challenges that Thorstensson considered was the issue of resource degradation and climate change (2011). Today, the global fashion industry generates nearly three trillion dollars annually, while being the second most pollutant industry on earth (Morgan, 2015). There was an increase in overconsumption, whereby consumers were relentlessly buying and discarding clothing faster than ever before (Thorstensson, 2011). In 2012, McCaster reported that Americans generally discarded and wasted more than 70 pounds of clothing, garments and other forms of textiles on an annual basis. The most recent research shows that the average American generates 82 pounds of textile waste each year (Firth, 2015). This pollution and waste is caused by practices used in 1) fiber production, 2) textile manufacturing and 3) garment manufacturing; however, 4) fast fashion has become the biggest concern of pollution and waste in the fashion industry.

Waste in Fiber Production

"Fiber is raw material that is long, strong and pliable enough to be spun into yarns and woven into fabrics" (From Fiber to Fashion, 2003 get page number). Growing, picking, spinning and weaving fibers into yarn, is the current process of fiber production. Allwood, Lauren, DeRodriquez and Bocken (2006) and later Fletcher (2008) concurred that this production had a negative impact towards the environment. High volumes of water, oil and electricity are used for producing cotton, which is currently the biggest form of waste in fiber production (Fletcher & Grose, 2012; Morgan, 2015). Cotton is

grown in more than a hundred countries and represents nearly half the total fiber used to make clothing today (Fletcher & Grose 2015; Zaroff, 2015).

Not only is this process wasteful, it is highly toxic, and poisoning people, water and land. “Cotton growers use three of the most dangerously considered pesticides – so dangerous that 120 countries agreed at a UNEP conference in 2001 to ban them, though so far this hasn’t happened.” (Minney, 2011, page number). Cotton production is now responsible for 18% of worldwide pesticide use, and accounts for 25% of total insecticide use (Morgan, 2015). Every year, over two billion dollars are spent on chemicals that are sprayed onto the world’s crops. Almost half is considered toxic enough to be classified as hazardous by the World Health Organization (WHO) (Fletcher & Grose, 2012). In order to protect the plants, farmers spray the fiber with chemicals, such as insecticides and pesticides. These chemicals are so dangerous that they cause about three million cases of poisonings each year, resulting in 20,000 deaths worldwide (Fletcher & Grose, 2012). The WHO explains that “When pesticides leak into the environment, chronic poisoning can affect entire communities” (Minney, 2011, p22). However, both fertilizer and pesticide companies refuse to recognize the impacts their product is having in regions of fiber production (Morgan, 2015).

Sustainability in Fiber Production

When the volume of water usage, dye impact, soil, health and labor issues are being seriously considered sustainability awareness in fiber production becomes quite necessary. As a result, various designers have form groups to champion the reduction and attempts to eliminate fiber waste and pollution (Zissu, 2011).

A program called the *Sustainable Apparel Coalition* is a group collaboration between various brands, retail stores, environmental interest groups, as well as nonprofit organizations, which focuses on reducing any form of harm towards the environment (Ridgeway, 2012).

Besides that, the production level in the industry still sees the domination of cotton in the market; yet, things are slowly changing (Casadesus-Masanell, Crooke, Reinhardt, & Vasishth, 2009). It was noted that a big brand, like Levi's, H&M, Adidas and Nike have taken the much needed step to join the *Better Cotton Initiative* to help different stakeholders in the fashion and environmental industry work together to reduce the impact that cotton produces (Bennett, 2012; Zissu, 2011).

At the organic level, sustainable designers have also decided to use organic fibers that are grown without synthetic pesticides, herbicides, fertilizers, growth regulators or defoliants (Fletcher & Grose, 2012). For example, "In its low-impact-focused 2010 Garden Collection, Swedish brand, H&M featured pieces in Tencel alongside other materials including recycled polyester, organic cotton and organic linen." (Fletcher & Grose, 2012).

By using a cellulose dissolution technique, developed by Technical Research Centre of Finland, worn-out cotton clothing can be turned into new fibers for the textile industry. "A group of Finnish organizations have launched a project, in the course of which the new production technique will be tried out in practice at all stages of the value chain, during 2015 and 2016….The first clothing line made of the new recycled fibers will be out towards the end of 2016. (Pirjo & Ali, 2015, p.).

Compared to organic cotton, this new technique reduces the water footprint by more than 70%, and the carbon footprint by 40% to 50% (Pirjo & Ali, 2015, p.).

Although organic materials may help, they can still contain many dangerous chemicals during the textile manufacturing process. The process of fiber production is just the first step in the weaving and finishing of a fabric. If organic cotton is conventionally produced, it will contain chemicals such as formaldehyde, azo dyes, dioxin, and heavy metals. Some of the chemicals come from residues from production, and others are added to give the fabric color, softness, crispness, wrinkle resistance, and more (Laucasse & Baumann, 2004).

Waste in Textile Manufacturing

Textile Manufacturing is forming the creation of fabric or cloth out of original fibers using mechanical or chemical processes (retrieved from http://www.textilesintelligence.com/glo/index.cfm) Consuming vast amounts of water and energy, these fibers are picked from the plants, cleaned, spun into yarn, and finally taken through specialty machines that weave, knit, and convert the yarn into a textile. Textiles are then taken through the finishing process, which include unsustainable methods like heavy bleaching, shrinking, mercerizing, singeing, scouring, dying and painting. This easily produces massive forms of toxic waste, resulting in land, produce and water contamination (Morgan, 2015).

During the textile finishing process, many dangerous chemicals are used in the dyeing and processing of fabrics. Krupnick points out that when these chemicals—like acid, bleach and toxic dyes (not plant derived)—are breaking down in nature, it can easily disrupt hormones and even cause cancer (2012). For example, per-fluorinated chemicals,

the base product of stain-repellent coating, is sprayed onto textiles to help prevent stains. Unfortunately, mothers exposed to this coating are evidently linked to low birth rates (Fletcher & Grose, 2011). Even certain azo dyes (like Red 2G) are prohibited for use in foods, yet somehow it is legal to use in the clothing that our body absorbs and is in constant contact with every day (Laucasse & Baumann, 2004). Even in California and Washington State, phthalates are outlawed in children's toys, but not in their clothing or bedding. Various studies have even shown that phthalates are even linked to breast cancer, asthma and even obesity in children (Endocrine Society, 2012).

The process of spinning and weaving take up most of the energy used, along with twisting, knitting, and dyeing. Kanpur, India runs along the river of Ganga, which is North India's lifeline and water supply. Heavy chemicals, like chromium-6, are used to treat the leather. As the leather export capital of India, Kanpur's local tanneries dispose more than 50 million liters of toxic wastewater each day. This toxic wastewater is being discarded in the same river humans use as drinking water and also ends up flowing into local farms.

Produce is also grown in this area, and is harmfully affecting India's health. The side effect it has on the people of Kanpur is detrimental. For example, many people have dermal problems like skin rashes, boils, pustules, numbness in the limbs and even cancer. People in the area of Ganga are drinking water that has chromium in it, which is making many people sick, and giving them jaundice (Morgan, 2015). Overall, over 2,000 different kinds of chemicals are regularly used in textile manufacturing, many of them being so toxic that they are outlawed in other products in the United States (Laucasse & Baumann, 2004).

Concerns continue to mount about the safety of textiles and apparel products, used by U.S. consumers. As reports of potential health threats continue to come to light, 'We are quite concerned about potentially toxic materials that U.S. consumers are exposed to every day in textiles and apparel available in this country,' said David Brookstein, Sc.D., dean of the School of Engineering and Textile and director of Philadelphia University's Institute for Textile and Apparel Product Safety (ITAPS) (Philadelphia University, 2008).

Currently, there are few U.S. regulatory standards for imported clothing or textiles; and Dr. Brookstein notes that many European countries, along with Japan and Australia, have much stronger restrictions on the use of chemicals in textiles and apparel. ITAPS is conducting research to determine if potentially toxic chemicals are present in imported clothing and other textile products. This also involves studying extent of their use, and will help establish stricter protocols for testing and evaluating imported items. "In testing so far, ITAPS researchers have found elevated levels of formaldehyde in children's clothing and brominated resins in car seats; both of these chemicals are known to have health risks." (Philadelphia University, 2008). This research was conducted so the Consumer Product Safety Commission would also study the use of formaldehyde in apparel (Philadelphia University, 2008).

Neglecting to care about the environment and the general well-being of humans is something major western brands brush off easily. Well informed of all the risks, they still source toxic textiles, covertly avoiding all responsibility for the growing cost to human health and the environment. Although textile manufacturing has been polluting

the environment for over 25 years, there are still people who care about how negatively it impacts the environment and the people living in it (Morgan, 2015).

Sustainability in Textile Manufacturing

Generating more waste, textile production is expected to touch around 35 billion pounds by the year 2019 (McCaster, 2012). In 2010, over 25 billion pounds of textiles and materials were generated in the United States. While 85% of this was recyclable, only 15% was recycled. On the other hand, there are some brands that are creating awareness and focusing on making a change. In 2006, popular fashion designers were part of a new fashion campaign that focused on going green, known as *Green is the new black* (Winge, 2008; p. 511). Fashion designers decided to investigate alternative ways to design in textiles, and found that natural dying methods would be more sustainable for the environment (Winge, 2008).

Natural dyes, derived from insects or plants, are sustainable because they replace the toxic dyes used in fashion today. Katherine Hamnett, British eco-fashion designer, is often recognized as one of the first designers to combine environmental activism with fashion and style. Since 1989, Hamnett has been developing an *organic* and ethical fashion line, which is becoming extremely difficult to accomplish. It is particularly challenging when ensuring the quality of the organic textiles, fair wages, and healthy working conditions for everyone involved in every aspect of creating her clothing lines. Before 1987, Hamnett started this eco-fashion awareness by creating oversized T-shirts sporting slogans such as *Make Trade Fair* and *Clean Up or Die*. "Today Hamnett designs *fashionable* clothing produced and distributed within her strict ethical and

ecological guidelines." (Winge, 2008, p.3). Still, Winge recognizes that eco-fashion has a long way to go before it can overtake the fashion industry (2008).

Natural dyeing methods have many positive qualities, but they can also be expensive in regards to time, water, energy and color fastness (Fletcher, 2008). While demand for water has superseded the earths supply, it has become a bigger concern, internationally. When using natural dyeing methods, one must keep in mind that if current trends continue, over the next 20 years humans will use 40% more water than they do now (Fletcher and Grose, 2012). Natural dyes can fade away faster than toxic dyes, but can also display a more natural look. One must also keep in mind that the textile, itself, may have been inorganically produced, still containing toxic chemicals from the fiber production process, as mentioned earlier.

Waste in Garment Manufacturing

Garment manufacturing is the process of transforming a textile into a finished garment. As recently as the 1960s, 95% of our clothing was produced in America. Today, we only make about three percent, as the other 97% is currently outsourced to developing countries around the world. Garment manufacturers have factories that currently employ over 40 million people, worldwide. Garment factory workers cut and sew textiles, finishing them into complete garments (Morgan, 2015). While forming these textiles into complete garments factories—also known as 'sweat shops'—are mainly located in underdeveloped countries where labor wage and regulation laws are seldom followed (Fletcher, 2008). In the fashion industry, brands continuously produce low quality garments at cheaper prices in order to cater to the masses, which is highly impacting the environment (Bennett, 2012).

When companies outsource production, there is a considerable amount of toxic, chemical and material waste polluting the earth, with no permanent solution. For example, the largest use of chemicals is in Punjab, India. Dr. Pritpal Singh has been studying side effects of these highly concentrated chemicals on human health for several years. His reports show that there is a dramatic rise in the number of birth defects, cancers and mental illness in Punjab. Although living conditions are dangerous, families cannot afford to move away or pay for any treatment. Dr. Pritpal explains that ultimately they have already accepted and are awaiting the death of their mentally and physically disabled children. Companies, who use garment factories refuse to acknowledge the impacts their product is having in this region (Morgan, 2015).

Although the fashion industry has become an essential part of society today, *fast fashion* has become a dominating factor that is posing as a barrier towards creating a more sustainable environment (Cataldi, Dickson, & Grover, 2010). ***Fast fashion*** is a contemporary term, used by fashion retailers, expressing the rapid movement of fashion collections being created from the catwalk to the consumer within two weeks (Minney, 2010). Fast fashion collections are designed 52 times a year, and are widely based on the most recent fashion trends presented at Fashion Week in both spring and autumn (Muran, 2007). Fast Fashion was developed with aims to push product through faster. In turn, retailers generate more waste at a faster rate, which mainly end up in landfills (Winge, 2008).

Since the 1980s, a typical life cycle for fashion apparel had four stages: introduction and adoption by fashion leaders, growth and increase in public acceptance, mass conformity, and finally the decline and obsolescence of fashion. Also,

the fashion calendar during this time was primarily based on the fabric exhibitions, fashion shows and trade fairs, typically resulting in developing a seasonal range of Spring/Summer and Autumn/Winter in one full year (Bhardwaj, Fairhurst, 2009). However, in the early 1990s, retailers started focusing on expanding their product range with updated products and faster responsiveness to the 'newness' of the fashion trends by providing products that have to be 'refreshed' very often (Barnes & Lea-Greenwood, 2006; Hines 2001; Holman 2007).

In order to increase the variety of apparel in the market, the fashion industry added three to five mid-seasons, putting immense pressure on suppliers to deliver smaller batches with less time between fashion seasons (Tyler, Heeley, & Bhamra, 2006). The concept of adding more phases to the existing seasons came into existence on the fashion calendar. Liz Claiborne, for example, developed six seasons instead of just two (Bailey, 2001). Changes in consumers' lifestyles and the need to satisfy their demand for more specific events were the reasons why more seasons were added to the fashion calendar (Bhardwaj, & Fairhurst, 2009).

In the past, runways and shows were the chief muses for the fashion industry. Along with this, trend shows were primarily restricted to designers, buyers and other fashion managers. However from 1999 onwards, fashion shows and catwalks became a public phenomenon. Pictures flooded magazines as well as videos on the web which, in turn, allowed public access to the inside fashion design world (Sydney, 2008). As a result, fashion retailers such as Zara, H&M, Forever 21, Mango, New Look, and Top Shop were adopting such designs rapidly to attract consumers and introduce interpretations of the runway designs to the stores within three to five weeks (Barnes, &

Lea-Greenwood, 2006). By being able to reduce production time with a quick response strategy, the industry shifted from forecasting future trends to using real-time data in order to understand the needs and desires of the consumers (Jackson, 2001).

Fast fashion has delayed an increase in outsource production, ultimately causing consumers to dispose of their clothing at a much faster pace than usual. In 2012, McCaster reported that an American generally discards and wastes more than 70 pounds of clothing, garments and other forms of textiles on an annual basis. Now, Americans are discarding up to 82 pounds per year (Morgan, 2015). This contributes to more than ten percent of the total waste collected in landfills nationally (McCaster, 2012). The rapid consumption of the fast fashion industry has dramatically reduced a garment's lifespan, which is now only six months to a year before it is discarded and thrown into a landfill (McDonough & Brogort, 2012). According to Minney, 1.5 million tons of discarded clothing and textiles end up in landfills each year (2011). The non-biodegradable fabric, used in fast fashion today, will take at least 200 years to biodegrade (Morgan, 2015). Chemicals, dyes and materials used to create a fast fashion product were never meant to be burned or left in landfills for over 200 years. These landfills release harmful gases into the air, especially when used to make fire or heat. Many people, living near landfills, use the discarded textiles to help ignite fires, keeping them warm for survival (Morgan, 2015). Burning the fabric, that contains highly toxic chemicals and dyes, is highly dangerous to humans, the environment and the air (McDonough & Brogort, 2012).

The popularity in fast fashion has created a brutal competition between garment factory owners as companies will only offer business to the lowest bidder, even if that includes failing to obey labor laws. In Dhaka, Bangladesh, garment factory owner Arif

Jebtik explains that fast fashion has allowed big retailers to negotiate down to the lowest price, when placing orders. As a result, the price of the product needs to go up, or manufacturers will be forced to cut corners, or shut down. Failing to obey labor laws and working conditions has caused four of the worst catastrophes in the fashion industry (Morgan, 2015).

Bangladesh is the second largest apparel exporter after China; and, unlike some of its competitors, Bangladeshi manufacturing remains cheap, as workers only make about two dollars per day and the unions have little to no power. About 40,000 people are working in almost 5,000 factories, making clothes for major western brands. Over 85% of these workers are women, and are the lowest paid garment workers in the world, making less than three dollars per day (Morgan, 2015).

In the documentary film, "*The True Cost',* developed by Andrew Morgan, 10% of donations are kept in the U.S., while 90% is exported to third world countries. Most of the exported donations end up in landfills, being used as scrap rags, or used to ignite fire. Living in the slums of landfills, the fire keeps families warm; however, burning low quality textiles is highly toxic to humans and the environment. Although many people have suffered, for the deadly cost of fast fashion, there are sustainable methods aiming to reduce or prevent pollution (Morgan, 2015).

Sustainability in Garment Manufacturing

Today, the following methods are being used for the sustainability in garment manufacturing and fast fashion:

a) The ***Reduce, Reuse and Recycle*** (RRR) waste hierarchy method is the most widely recognized concept pertaining to sustainable practices for the environment. The

idea of 'reducing' is an attempt to reduce the consumption of any new materials, along with reducing energy usage and air pollution. 'Reusing' pertains to the practice of reusing non-biodegradable textiles or products instead of throwing them away after one use. For example, wearing hand-me-downs or purchasing items from a thrift store is considered to be reusing. 'Recycling' is the process of converting waste materials into new products in order to reduce waste. Recyclable materials include various types of glass, paper, plastic, metal, textiles and electronics. The RRR (Reduce, Reuse, Recycle) method was widely communicated to consumers as reducing water or electricity usage, reusing materials or textiles that are not biodegradable, and recycling plastics or anything that is considered recyclable. The "Reduce, Reuse, and Recycle" waste hierarchy was created to temporarily help reduce pollution and waste, but was never meant to be a permanent solution (Braungart & McDonough, 2002). The Reducing method only slows down the rate of pollution; Reusing causes wear and tear and eventually ending up in a landfill; and, Recycling may seem environmentally friendly, but in the end, the process causes more pollution (Thorstensson, 2011). Although this hierarchy method works as a temporary solution to reducing pollution, it does not eliminate it completely. Today, designers have started using more efficient ways to reduce, reuse, and recycle.

b) ***Fair Trade*** is a social movement with the goal of facilitating producers – in developing countries – achieve healthier and safer trading conditions and to promote sustainability. Members of the movement advocate the payment of higher prices to exporters, as well as promoting higher social and environmental standards. Fair prices are paid to producers in developing countries (Minney, 2010). Safia Minney, founder and CEO of *People Tree*, started a fair trade fashion brand 20 years ago in Japan. She created

People Tree in order to improve the working conditions in developing countries. Minney explains Fair Trade as, a citizen's response to correcting the social injustice in the international trading system that is largely dysfunctional. Where workers and farmers are not paid a living wage, and where the environment is not considered important at all….to make the products that we buy every day (Morgan, 2015).

Minney explains that most designers start with a concept of a collection or look. They do not think about who will be producing the product, or if they can afford to eat that day. Unlike designers, Minney has a possible solution to the problem. She now works with 60 different countries and has over 3,000 fashion shows that all work with Fair Trade (Morgan, 2015; Minney, 2010).

c) *Zero Waste* is a sustainable method used during the pattern cutting process. Garment producers waste approximately 15% of material when cutting a pattern for an adult sized garment. This produces much waste which ends up in the landfills. Many fast fashion retailers, like H&M and Zara, use this unsustainable practice (McQuillan, 2009). Designers use the zero waste method to be more sustainable, by creating a pattern that efficiently uses most of the materials, thus producing less waste. Although this is a sustainable method, it is only reducing waste by up to 15%. This helps reduce, but does not completely eliminate waste (Fletcher & Grose, 2012).

d) *Repurposing* is the process of reproducing the same exact product, from the old product, for the same use. Although recycling is a more popular approach, it tends to degrade the quality of a product over time because the same exact materials are being reused (Thorstensson, 2011). Repurposing can revive the product, if new textiles are used to replace the old. For example, an old couch can be repurposed if it is replaced

with the same exact materials, bringing it closer to its originality. This method brings the value back into a product that has lost its original given value (Braungart & McDonough, 2002). Repurposing is the process of recycling and adding materials to change the appearance of the dress. This is more beneficial than recycling, as there is a new design concept, creating a new look for the old dress. However, using new materials costs money and will create waste from cutting new patterns (McDonough & Braungart, 2012).

Not all sustainable methods can be completely eco-friendly. However, **upcycling** is a process that continues after the use phase, by creating and upgrading the material or garment to create something that is valuable to consumers, which creates the usage of the same product in a more efficient way (Payne, 2011).

e) *Upcycling* can be defined as a concept that converts used or unusable products into a higher quality product, making it more environmentally friendly (Thorstensson, 2011). The main purpose of this process is to reuse waste materials, transforming them into something of higher value or quality, with aims to prevent materials from being wasted (Smusiak, 2010). Due to the shift in consumer perception, wanting eco-friendly materials and products, upcycling has become a more popular approach in developed countries like the United States, Britain and even Australia (Goldsmith, 2009). Due to the low cost of manufacturing, as well as highly reasonable prices for consumers, these products are proving to be popular in today's society (Goldsmith, 2009). Upcycled goods are designed with high quality craftsmanship and in great detail; making it unique, fashionable and irreplaceable (Cassidy & Li-Chou, 2013).

As upcycling has become more apparent in sustainable fashion, it has also become more popular with consumers in the fashion industry (Ngo, 2014). One of the

solutions identified to reduce waste in landfills, is through the process of upcycling waste, so that the never-ending cycle of waste stops (McCaster, 2012). Using the concept of upcycling, designers are able to create high quality fashion, which focuses on the future of fashion, specifically leaning towards couture collections (Ngo, 2014). According to Myers (2014), in order to create or change a piece of clothing into that of higher value, upcycling needs a designer who can see through waste.

Although there is more labor used to upgrade a garment, most of the materials used to do so are unwearable or discarded items from the industry (Cassidy & Li-Chou, 2013). A small percentage of new materials are sometimes required to complete the product. However, most designers mainly use discarded items, heavily dropping the cost of textiles. It also prevents the discarded items from ending up in landfills (Braungart & McDonough, 2003).

Products, upcycled by professional designers, can highly increase the value of an upcycled product, which, in return can increase the awareness as well as the profit margins for designers and the public (Crabbe, 2012). The manufacturers do not have to spend much to buy an existing product, or to just use products that are thrown away, and thus, this increases the profit margins for the manufacturers. It was also found that when a product carries an eco-friendly label, many consumers often perceive the positive intangible benefits that come with these products due to the educational type marketing (Crabbe, 2012). A project conducted by Young, Jirousek and Ashdown (2004) created women's apparel based primarily on Post-Consumer Recycled (PCR) clothing.

(f) ***Post-Consumer Recycled*** **(PCR)** clothing is any donated or discarded textile that will be deconstructed, and then transformed into something different than that of its

original state. The successfulness of this concept depicted the readiness of the public towards accepting eco-friendly products, and also had positive attitudes towards sustainability (Young, Jirousek & Ashdown, 2004).

The study concluded that it was successful in being socially acceptable. The project also focused on urban young professionals who were environmentally aware and were commuting, using public transportation. The design label was named 'un-designed', in order to shift the focus towards the way the garment was made (Young, 2008, p.61). From its original design, garments were first deconstructed, then reconstructed, creating something different and new, forming a higher value for the garment. Specific methods of upcycling were used in this study to demonstrate that discarded clothing can be transformed into anything, as long as it holds more value than it did in its original state (Cassidy & Li-Chou, 2013).

The concept of upcycling, has appeared in many recent television shows, especially the series, *Project Runway*. *Project Runway* is a reality show competition recruiting the world's best designers, and having them compete against each other. For the past couple of seasons, the urgency of sustainability has been prevalent in this challenging competition. In season 13, two episodes involved using a form of upcycling. One competition involved upcycling men's business suits that were over 50 years old. The other challenge was to upcycle three cohesive looks from discarded items left in a storage facility. A designer upcycled a dress using couch materials, and another transformed an old painting into a stylish jacket. A Hawaiian designer even upcycled a dress from soccer ball material by cutting out each shape and redesigning it into a fitted look. Their designs used discarded items, and were valued higher than their original

state, displaying a form of upcycling (Hulu.com/Project Runway, 2015). For an example of the upcycling episode on *Project Runway,* please refer to figure 1 below.

Figure 1: Hawaiian designer upcycled a men's vintage suit into a women's high fashion dress on the show, Project Runway (Hulu.com, 2015)

Besides television, online social media has taken note of the need for a sustainable movement. Pinterest, is a website that allows anyone to create a profile, by sharing their own or others' ideas, posting it in a more organizational way, then creating a collage for ideas and inspirations. Consumers share and use creative ideas other consumers have posted on the website helping create a community of shared ideas that can be very creative and affordable. as well as post pictures of their Do It Yourself (DIY) projects. DIY projects, have recently become a popular terminology that consumers use online, when posting a picture of something they made themselves. Many sustainable designers,

post and share their upcycled items. For example, Sarah Tanulla sells upcycled furniture, which is sanded down and repainted for a unique and stylish look. Suzannah upcycles dresses and sells them on her website, specifically and easily accessible to the Pinterest consumer (Etsy.com, 2016).

In terms of prevention, there are no ways to completely reverse or stop pollution. However, certain sustainable methods are more efficient than others, in terms of waste and pollution. In summary, organic fibers or materials are chemical free, but can still go through a toxic dyeing method, thus making it a toxic material again. Natural dyeing methods prevent harmful dyes and chemicals from being consumed; but it can still contain toxic chemicals used in the fiber production process. Fair Trade helps workers get most of their rights back, but it does not help prevent pollution from occurring. The 'Reduce Reuse Recycle' hierarchy was created to help reduce waste, but not help stop or prevent it. Zero waste methods can help prevent waste from pattern cutting, but can still be inefficient as materials can be inorganically created, and can still end up in a landfill. Repurposing is more sustainable, but the item may not last as long, as it is a better form of recycling. Eventually, repurposing the same item will cause wear and tear, ending up in a landfill. Although upcycling has its flaws, it is the most efficient form of waste prevention. When a product is recycled, or repurposed, it goes through a similar process as upcycling. What gives upcycling more value is the fact that it is upgraded from the products' previous or original state. As a higher quality garment, it will have a longer life than a repaired, repurposed or recycled garment; and, it will not end up in a toxic landfill.

Waste in Wedding Dresses

While the fast fashion continuously produces more waste, without any punishment, other sections of the industry are not far behind. Weddings have become increasingly essential to society, noted to be one of the most extravagant and expensive ceremonies held today (Random History, 2007). The U.S. wedding industry makes more than 50 billion dollars annually, and costs are between $26,000 and $35,000 per wedding. While holding strong sentimental and emotional value, wedding dresses can have the biggest impact of waste in the environment. In terms of cost, use and storage, wedding dresses have been reported to be the biggest waste in the fashion industry (Buckley, 2006). The Huffington Post (2013), notes that wedding dresses are one of the most expensive tailoring purchases a woman will make in her life. According to the Wall Street Journal, "In the U.S. Today (2011), bridal wear sales total more than $2 billion annually." Not only do they have to spend money on the dress, but brides purchase jewelry, the veil and pay high alteration costs.

What do brides do with their dress after the wedding? After only being used once, the dress is cleaned, boxed up, and stored eventually costing money and wasting space (Kinsman, 2013). A website that helps brides sell their gowns, PreOwnedWeddingDresses.com, surveyed 2,766 women from the ages 18-55. From these women, 19% said that they have no good reason to keep it, and 11% said the dress takes up too much space to justify keeping it. Due to poor quality, old design, or lack of space, wedding dresses are eventually discarded, passed down, or donated (Huffington Post, 2013).

Sustainability in Wedding Dresses

As weddings have become more sentimental, the brides have become more emotionally attached to their wedding dress. Designers have taken notice, and some have taken the initiative to create the proper channels to sustainably design wedding dresses. Sustainable designers are using organic cotton, hemp, silk or recycled textiles to design their wedding collections. For example, Tara Lynn, an eco-friendly wedding dress designer, uses purely organic materials such as cotton, hemp and silk (Kim, 2013). By using organic textiles, Tara Lynn promotes sustainability in the area of fiber production.

While she is practicing sustainability, the cost of organic, natural and recycled textiles are much higher than non-organic textiles. Although these materials are free of toxic chemicals, they can still be unsustainable. As mentioned earlier, organic cotton wastes higher volumes of water than conventional cotton causing a price increase for the dress (Fletcher & Grose, 2012). While Tara Lynn is a sustainable organic wedding dress company, there are more efficient methods of designing in this area.

Although brides make their own wedding plans, they often request their mother's involvement in the dress decision making process. *Something Borrowed, Something New*, is a television show on TLC that helps brides choose their dream wedding dress. They have to choose between a new or upcycled dress. This upcycled dress was their mother's old wedding dress that needs an update. When deciding between a family heirloom and a new gown, emotions can run high. Mothers bring in their old wedding dress, hoping that designer Kelly Nishimoto can upcycle and update the look. The client's daughter explains her ideas for the dress. Nishimoto starts upcycling while stylist, Sam Saboura, finds a new dress for the client. At the end, the client tries on both

dresses and gets to choose ‘something borrowed’ but now upcycled, or something new. As an example, although Nishimoto is, by definition, upcycling wedding dresses, there are still more sustainable ways to design in the realms of upcycling. Instead of using all new materials to upcycle the dress, she can use remnants of high quality materials that would otherwise be discarded. She can also hand sew the dresses, instead of paying sewers to machine sew, which leaves less room for mistakes and the discarding of materials/material wastage. Therefore, it would be ideal to transform this dress into something more fashionable and desirable that one could use more than once (TLC.com, 2015).

A great example of a famous designer, who is involved with wedding dress and sustainable design, is Vivienne Westwood. Westwood, who was popular for introducing punk fashion and creating inspiring dresses with unique themes, is also enthusiastic about climate change and often shows her concerns through her blogs and by attending protests and gatherings in public (Cain, 2014; Vogue, 2015). There was also a fashion project that was in support of climate change that rebelled against the notion that a wedding dress should only be used one time, and to neglect the idea of throwaway fashion in today's society (Sheffield Hallam University, 2011). The design project was also supported by Vivienne Westwood and Wayne Hemingway, which was focused on raising awareness on disposable fashion issues (Sheffield Hallam University, 2011). Furthermore, a few years back, a popular designer used upcycling as the theme of his fashion collection. The material reused was organic cotton with jersey material and squirrel print. Designers are developing and focusing their collections on environmental issues, and it is becoming a passionate trend in the fashion industry (Menkes, 2011).

Upcycling Wedding Dresses

Crabbe termed **upcycling** as a responsible design whereby the focus is mainly on finding new usage and functions using waste consumer products. The concept of upcycling and sustainability share a positive relationship, whereby the process of upcycling actually helps to increase sustainability of the environment, mainly by reducing wastage (Crabbe, 2012). According to Romero and Korkiakoski (2014), the cycle of a fashion garment begins with the conception of idea (design), the production of the cloth, the distribution, the use, and end of usage (Gwilt, 2014). Each of these stages has waste, and is in no way sustainable. Upcycling is a process that continues after the use phase by creating and upgrading the material or garment to create something that is valuable to consumers, and that creates the usage of the same product in a more efficient way (Payne, 2011).

According to Fletcher (2008), an upcycled garment consumes up to twenty times lower resources than making a new garment, which impacts the environment positively rather than negatively. Upcycling is a better approach, since the main idea is to reuse the material, but by increasing or maintaining the quality of the cloth and the aesthetic design. This leads to a more sustainable approach because waste can be reduced drastically over time (Braungart & McDonough, 2003).

Approximately 2,326,485 wedding ceremonies were conducted in the United States back in 2009. The average cost per dress was $1,075, and increased by 11.37% from 2008 to 2009. Despite the economic downturn, spending on wedding dress sales in the U.S. has been a resilient $2.2 billion; which indicate that wedding dresses will always be in demand (Thomas & Peters, 2011).

As mentioned earlier, upcycling is the most cost efficient to the consumer and the most profitable sustainable approach to the designer, which is why the upcycling technique was chosen to redesign discarded wedding dresses (Braungart & McDonough, 2002). When upcycling, all discarded textiles and garments are considered before shopping for more materials. This can eliminate or lower material cost, and also helps save garments and materials from ending up or filling up in landfills. Lastly, this can benefit the consumer, as they can be sustainable and fashionable at a more affordable and realistic cost (for high fashion couture) (Braungart & McDonough, 2003).

Upcycling Techniques

Although several upcycling techniques have been used over the years, most of them are identical with small variations, such as added sleeves, adding a bow and adding embellishments to already established styles

Over 60 different types of upcycling techniques were documented since the Great Depression. During the 1920s, women found alternative ways to recreate new fashions with their old textiles. During WWII upcycling became prevalent again as resources were limited in the 1940s. In the last 75 years, pollution and waste have not only increased, but have also infiltrated the earth. This trend of wasteful consumption has maintained the need for more efficient sustainable methods of fashion design (Rosner, 2014).

Kim M. Rosner conducted a research project to create efficient upcycling techniques in textile design, with consideration to sustainability. As modern fashion designers explore the creative process of upcycling, the traditional fashion design practice needed to be reconfigured and documented (Rosner, 2011).

Starting from the Great Depression, Rosner combined and created upcycling techniques that considered all angles of sustainability in the design process. Developed from the author's literature review and theoretical framework, a checklist of considerations were developed to ensue all aspects of sustainable design. After developing the theoretical check list, Rosner tested the process and developed a small fashion collection inspired by upcycling techniques of the 1920s. After this collection was developed, improvements were made to the checklist with aims to create a more proficient and sustainable design technique.

After revision, a second collection was developed and tested, stemming from inspirations of 1940s upcycling techniques. Although a checklist of considerations were developed to support data collection, it was concluded that it also provided a useful guideline to assist a design practitioner on the sustainable process of upcycling. This research project highlighted three main sections including design, sustainability and production, and also compared regular design techniques to upcycling techniques. In conclusion, more detailed stages were found in upcycling techniques than that of regular design.

Chapter 3: Methodology

The goal of this project is to develop a wedding collection that will represent the sustainability in upcycling techniques. The design's priority is to incorporate the principles of upcycling by transforming two discarded wedding dresses into couture wedding gowns. This, in turn, will demonstrate potential beauty in a discarded dress without further causing pollution. *UpCycouture* is a term the current researcher uses to describe the collection, by transforming discarded wedding gowns into high fashion couture, thus collaborating the words *Upcycling* and *Couture* into *UpCycouture.* This chapter will introduce the design process of the upcycling and the evaluation plan. The design process of upcycling is included in the following stages.

Stage 1. Trend Research

Stage 2. Locating Discarded Wedding Dresses

Stage 3. Material Selection

Stage 4. Mood Board Development

Stage 5. Design Development through Sketches

Stage 6. Upcycling the Wedding Dresses

a. **Deconstructing Discarded Dresses**
b. **Creating Patterns**
c. **Mock up/Prototyping**
d. **Finished Design**

Stage 1: Trend Research

In order to upcycle and transform discarded dresses into a high couture fashion wedding dress collection, it was necessary to research, review and analyze various types of design. This research included types of design styles and material quality related to wedding dresses. Many avenues of research were explored, in terms of wedding dress trends, by using the internet, analyzing television shows, visiting a store and consulting friends and family.

Before the internet, designers and brides-to-be were limited to bridal magazines, bridal fairs, scheduled wedding dress appointments and the opinion of family and friends. Today, the internet has helped women access and share more ideas, trends and inspirations for their wedding and dress (Thomas and Peters, 2011). According to Thomas and Peters, today's bride will watch popular television shows such as TLC's, *Say Yes to the Dress*, or read and/or post comments on popular online social media sites such as *TheKnot.com, WeddingChannel.com, Brides.com or Pinterest.com*. In 2009, 77% of brides used the internet to aid in planning and/or purchasing of wedding dresses, related products and services. Marketers have recognized that online communities are highly popular, as they help consumers seek advice and brand meaning from other consumers like themselves (Thomas & Peters, 2011). This specific research was conducted from December 2012 to January 2016, and many interesting results were found.

Pinterest.com included pictures of high fashion wedding couture, as well as several opinions and suggestions from consumers who viewed or posted the pictures. Wedding couture designers, specifically researched, were Vivienne Westwood, Galia Lahav and Berta Bridal. Cost on these high quality couture wedding gowns start at

$5,000 and go up from there. In terms of television, *"Something Borrowed, Something New"* and "*Project Runway"* were investigated. These shows helped provide the researcher with more innovative ideas on wedding dress sustainability and upcycling techniques.

Lower quality gowns were difficult to research online, as many pictures were edited, enhanced, or attempted replicas of high couture wedding brands were shown. For this reason, the researcher decided to physically go to a lower quality wedding dress store that was widely recognized throughout the country, David's Bridal. With more than 300 stores throughout the country, David's Bridal offers low quality and low prices on a wide selection of mass-produced gowns. Carrying some of the least costly gowns available, David's Bridal dominates approximately 50% of the $600-and-under wedding dress market (McDevitt, 2009). Having been called, "The Wal-Mart of weddings," David's Bridal manufactures using cheap materials, manufactures abroad, and purchases in bulk. As a large bridal retail chain, David's Bridal sells dresses from $99 to $1200; with their average dress retailing at $550 (McDevitt, 2009).

By visiting David's Bridal, it allowed the researcher to physically analyze the lower quality textiles and design methods used. Most dress styles seemed cheaply made, especially the lowest quality of tulle material used for each dress analyzed. Many dresses had the same pattern design, but few embellishments were added to seemingly alter or change the look. Most dress styles seemed outdated, when compared to research conducted online. This specific research, with a physical store visit, was conducted in May and November of 2015.

Stage 2: Locating Discarded Wedding Dresses

In terms of regular fashion design methods, this stage does not exist, as the designer usually creates a dress from all new textiles purchased from fabric stores (Rosner, 2014). The researcher located discarded wedding dresses from thrift stores, friends and family. Thrift store purchases were made in March of 2015, and donations were given during January 2016. All dresses were checked for longevity and quality, to ensure the dresses' ability to survive a reconstruction of upcycling techniques.

Stage 3: Material Selection

In regular fashion design methods, material selection is made when the designer has developed all ideas, and is ready to cut, sew and finish the garment (Rosner, 2014). In upcycling methods of design, the designer collected all possible textiles and garment materials, before any ideas were developed. Discarded textiles were found at thrift stores and remnant fabric stores in suburban areas. Materials were also collected from estate sales, and donations from family and friends. By collecting all possible textiles beforehand, it allowed the designer to physically view materials they could work with, and what extra materials they needed to purchase. If additional textiles were required, the designer acquired these materials from visiting thrift stores, in hopes to find more textiles that would otherwise be discarded.

Stage 4: Mood Board Development

A mood board is defined as a visual representation of research, analysis, and inspiration, which is a key tool in communicating their design to others (Cassidy, 2011; Vangkilde, 2011). Mood boards cohesively unite the designer's collection, helping provide a story and focal point for the audience and the presenter. Mood boards can

include such things as textiles, materials, embellishments, any pictures of art, architecture, nature or color for design inspirations. In regular design methods, usually one mood board is needed for an entire collection. In terms of upcycling, more than one mood board is needed for each discarded dress as more detail and work go into each upcycled design. The researcher found that these mood board concepts were identical in terms of methodology.

Stage 5: Design Development through Sketches

In fashion design, a sketch is traditionally used as a way to document ideas and inspirations. Sketching is considered to be a development tool that includes basic information of color, silhouette and proportion (Rosner, 2014). However, with upcycling, several different avenues of sketching were used, including sketching possible dress designs, pinning and draping possible dress designs onto the mannequin, and finally taking pictures of these various designs that were manipulated on the mannequin with pins. Sketching techniques can be applied at any stage of the upcycling process in order to convey and explore changing ideas, thus becoming increasingly refined as the process moves forward. As final sketches became more defined, pictures and video were taken and used as a recording device. Pictures and video were used to illustrate certain components of draping and pinning styles onto the mannequin, production values, and ideas that evolve from the beginning of prototyping.

Stage 6: Upcycling the Wedding Dresses

Deconstructing Discarded Dresses

Traditional fashion design involves draping materials (unbleached cotton) onto a mannequin to create their own design (Rosner, 2014). In terms of upcycling, the

discarded dress is deconstructed while on the mannequin. The amount of deconstruction involved, depends on the condition of the dress. The deconstruction process is very intricate work as the dress cannot be damaged.

Creating Patterns

In traditional pattern design, pattern pieces are created from the draping process. The designs are then transferred onto pattern paper. In upcycling pattern paper is not used. Instead, the designer creates pattern pieces using materials that will be used for the final design. These pattern pieces are created and hand sewn, then pinned and eventually hand sewn onto the dress.

Prototyping

The prototyping or sampling stage involves creating a garment sample. Another term for this is a "mock up sample". Mock up samples are usually designed from untreated cotton, called muslin. A mock up (sample) of the dress is sewn from the created pattern, in order to correct any mistakes before finishing. By creating a mock up sample, the designer can still create any last minute additions or alterations to the final design. This is done by fitting the mock up sample onto the mannequin, analyzing all angles of design, pinning any areas that need altering and refining the design for more accuracy (McKelvey & Munslow, 2003; Seivewright, 2007). When upcycling, prototyping is done differently. A mock up sample is not necessary, because the created pattern pieces are pinned directly onto the dress (which is still on the mannequin). In order to prevent any mistakes, many pattern pieces are temporarily pinned onto the dress to visualize various possible designs. Documenting this process with pictures and video provides a better visual understanding of the potential finalized design.

Finished Design

In fashion design methods, when the prototype is finalized, the designer will use their chosen materials to sew and complete the garment (Rosner, 2014). In upcycling, the final placement of pattern pieces are pinned, and hand sewn directly onto the dress (which is still on the mannequin). After the finalized design is complete, more decorative embellishments or alterations can be made.

Evaluation Plan of the Upcycled Designs

The researcher will have the upcycled wedding dresses evaluated by two revenues.

First, the researcher will request to display the upcycled designs at CSUN's TRENDS fashion show of 2016. The researcher plans to request evaluations of the dresses from five professional judges that will be attending the fashion show. These judges have fashion related backgrounds who are in the fields of professional marketing, apparel designing, image-consulting, trend-forecasting and bridal design.

The second revenue will include an evaluation from a collection of professional artists; jewelers, fashion and sustainable designers, along with jewelry store and wedding boutique owners. An evaluation will be sent to these professionals, including pictures of the designs before, during and after the upcycling process. In addition, pictures from the fashion show will be added, to further provide evaluators with a more realistic way to view and judge these dresses. Comments and suggestions provided will further assist the researcher with a better understanding of viewpoints in different and important aspects of design.

Chapter 4 – Results

By using the design process, presented in the previous chapter, two discarded wedding dresses were upcycled. In this chapter, the outcomes of each design process will be discussed. Stage one includes overall wedding dress trend research, and stage two through six will concentrate specifically on each upcycled dress. Each wedding dress was named after the person who so kindly donated their garment to this research project.

Findings from Trend Research

The following pictures are where the researcher best found information for wedding dress research. Below are pictures of research found from the internet, television and visiting a bridal store.

Pinterest.com was the most helpful with researching today's wedding trends, as it included a combination of information that was beneficial to my research on current social wedding trends. Pinterest includes a variety of wedding dress trends including middle and high quality dress styles, sustainable trends in the current wedding industry and DIY wedding dress designs. For this reason, the researcher was able to find many wedding dress trends, as women search and can post their wedding ideas, inspirations and comments to this free idea sharing website. Many sustainable wedding dress designers posted pictures of their collections on this website using natural fibers, like organic cotton and silk (Pinterest.com, 2016). The researcher found popular couture wedding dress brands including Berta Bridal, Galia Lahav, Riki Dalal, Inbal Dror and Krikor Jabotian. Figures 2, 3 and 4 are some examples of high fashion couture wedding dress designers who can be found on *Pinterest.com*. Refer to figures below.

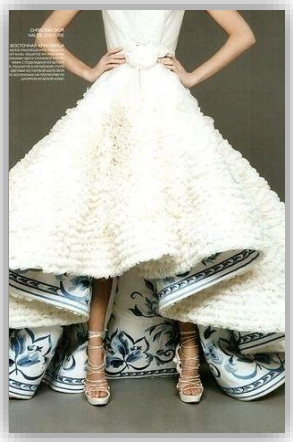


Figure 2: Blue and white dress

Figure 3: Krikir Jabotian

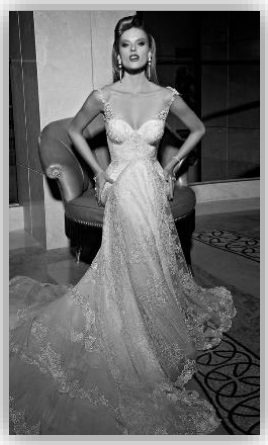


Figure 4: Couture wedding

As previously mentioned, the researcher visited David's Bridal in May and November of 2015. Many dresses had little differentiation with cut style and quality, and the majority of dresses were strapless with lower quality beading and rhinestones. The researcher avoided designing mass-produced styles, as they are usually outdated and not couture. As a result of poor quality and construction, beads were missing from almost every dress that was analyzed. In regards to material, tulle and satin fabric felt rough, had pulls and rips, and were low quality. (See figures 5, 6 and 7 below).

Figure 5

Figure 6

Figure 7

Examples of the small variations among three different dresses at David's Bridal, Fresno CA, Nov.2015)

When researching wedding trends through friends and family, the researcher's friend, Marineh Ventresca, wore a Berta Bridal couture dress for her wedding. This couture dress included high quality beading, textiles and tulle. She altered her gown, taking the extra trimmings from her alterations and adding the draped sleeves. Refer to figures 8 and 9 below.

Figure 8 *Figure 9*

Pictures of Marineh Ventresca, in her Berta Bridal couture dress on her wedding day, and a close up picture of the added sleeve used with the remnants of her alterations (Picture taken by Talene K. in Fresno, Ca. September 19, 2015).

Vivienne Westwood was a great original influence for this thesis project, as she designs couture wedding dresses, and has also been involved in upcycling and sustainable design. The researcher was greatly inspired by Vivienne Westwood's wedding dress design that was in the movie, "Sex and the City". In the movie, Carrie Bradshaw (Sarah Jessica Parker) is getting married in New York, and is given a high-fashion couture dress to wear for her wedding ceremony and for a magazine cover photo shoot. The figure below depicts the Vivienne Westwood dress being worn by Sarah Jessica Parker during the making of the movie. Refer to figure 10 below.

Figure 10: Vivienne Westwood's wedding dress design, worn in the movie, "Sex and the City" (Retrieved from images on google.com on May 2014).

Design Process of Diana's Dress

Figure 11: A before and after picture of Diana's Bridesmaids Dress. (Picture taken by Talene K. 2015-2016)

Stage 2. Located Discarded Wedding Dress

Diana Rowe, a very close family friend, donated her white bridesmaid dress that she wore for her friends' wedding in Los Angeles, California. This dress was made in Los Angeles, in 1990, and resembles a simpler style of a wedding dress. This dress was named, "Diana's Dress". Refer to figures 12 and 13 below.

Figure 12

Figure 13

Diana Rowe, wearing bridesmaid dress at her friend's wedding in 1990 (retrieved from Diana Rowe, 2016).

Stage 3: Material Selection

The researcher decided to use tulle as the dominant fabric choice, since over 200 yards was collected from home, friends, family and remnant fabric stores. This was enough to upcycle Diana's Dress. Besides using tulle, the researcher used all discarded textiles, including those collected from friends, family, textiles left over from old projects, and those gathered from thrift stores. Below is a picture of some of the discarded textiles used in "Diana's Dress". Refer to figure 14 below.

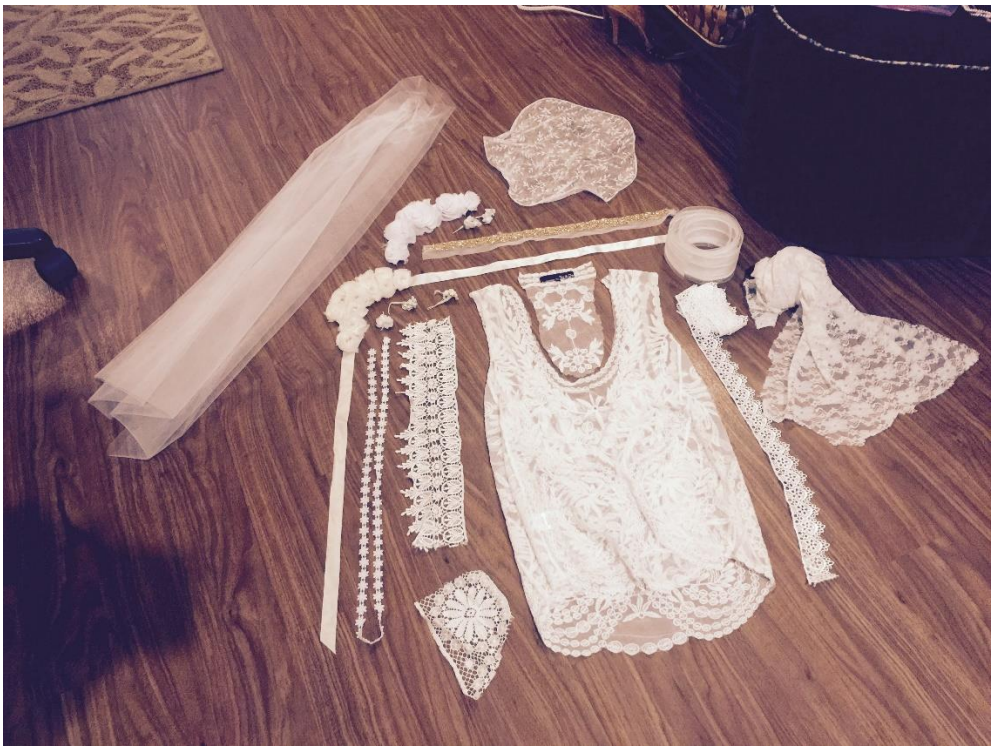


Figure 14: Discarded textiles, materials and remnants researcher used for first dress design. (Picture taken by Talene K., January 2016)

Stage 4: Mood Board

Many mood boards were created in terms of upcycling specific areas. For example, the researcher had two mood boards for wedding dress back and front designs, and finally condensed them down to preferred styles that could work well with the first discarded wedding dress. Refer to figure 15, below, for final mood board selections.

Figure 15: Final mood board for Diana's Dress (Created by Talene K. March 2016).

Stage 5: Sketches

In the upcycling process, many sketches were created as ideas changed along the way. Below are some sketches made before, during and after upcycling Diana's dress. For sketch examples, refer to figures 16, 17, 18 and 19 below.

Figure16: Possible design for first dress with lace trim on all edges of tulle or satin fabric. Sketch drawn by Talene K., 2015.

Figure17: sketches of different back straps for dress. Strap material will be tulle or something sturdier (Sketch drawn Jan. 2015)

Figure 18 *Figure 19*

Possible designs for top and bottom of the dress including strap designs. (Created January 2016)

Stage 6: Upcycling the Wedding Dress

Before upcycling Diana's Dress, pictures were taken at every angle, to better display the original design before any deconstruction had been made. Refer to the figures 20 and 21 below.

Figure 20

Figure 21

All angles of Diana's Dress before deconstruction (Picture taken by Talene K. 2015).

Deconstruction of Diana's Dress

The first part of deconstruction was made in the front part of the dress. A deep cut was made in the center front, in addition to removing the flowers and tulle. Refer to figures 22, 23 and 24 below.

Figure 22: First cut made in deconstruction process by fabric scissors (Picture taken by Talene K., 2016).

Figure 23: Then, it is pinned, altered to a smaller size and sewn by hand (Picture Taken by Talene K. 2016).

Figure 24: After alterations are sewn, flowers and tulle were carefully removed with a seam ripper (Picture taken by Talene K., 2016).

After alterations were complete in the front, the back of the dress was also altered. Originally having a high back, the back design was measured, cut, hand sewn and altered into a lower back style. Refer to figure 25 to see original back design, and figure 26 for new back design.

Figure 25: Original back design of dress before any deconstruction.

Figure 26: Deconstruction design process of dress back. (Picture taken by Talene K. 2016)

Created Patterns

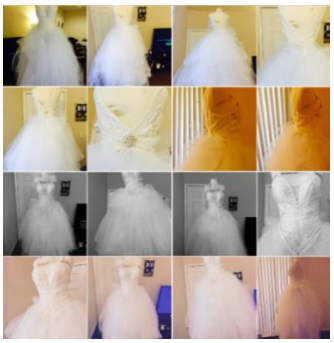
In terms of sustainable design, using zero waste methods was the best option, as it caused the least amount of textile waste (Rosner, 2014). In addition, rectangular cut patterns produced the least amount of textile waste (2014). All pattern pieces were cut and shaped into forms that would prevent waste development. For examples of this process, refer to figures 27, 28 and 29 below.

Figure 27 *Figure 28* *Figure 29*

Process of forming tulle panels, hand sewing them into pattern pieces, and then pinning and sewing onto the bottom portion of Diana's dress. (Taken by Talene K., April, 2016).

Mock up/Prototypes

Many prototypes were created before making final decisions on details of the finished design. After each prototype was created, pictures were taken and then turned into mood boards for the researcher to visually see how possible finished designs could look. Figures 30, 31 and 32 are some examples of the mood boards created for prototyping Diana's Dress.



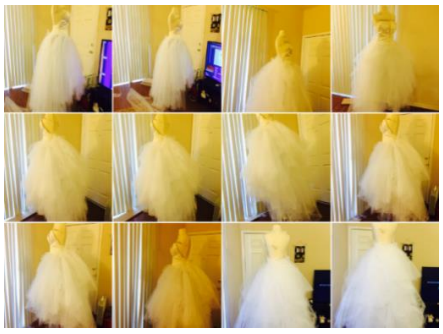


Figure 30 *Figure 31* *Figure 32*

Mood boards that were created for the prototyping process of Diana's dress. (Picture taken by Talene K., 2016).

Finished Design

After analyzing mood boards of dress prototypes, a final decision was made for the design of Diana's dress. When the final design was decided, more patterns were created, and temporary pins were taken off one by one as the researcher hand sewed each pattern piece directly onto the dress. Dress straps were altered to better fit the model wearing the dress for the fashion show. Figures 33, 34 and 35 below, are examples of the finished designs before and after fashion show dress modifications.

Figure 33: Finished dress design pre-fashion show alterations

Figure 34: Finished dress design post-fashion show alterations

Design Process of Susanne's Dress

Figure 35: Before and after picture of Susanne's upcycled dress design. Pictures taken by Talene K., 2016

Stage 2. Located Discarded Wedding Dress

Susan Anne Karkazian, my mother, donated her wedding dress that was purchased and worn on July 10, 1982 in Fresno, California. Susan found this dress in San Francisco, when wedding dress shopping with family and friends. This dress was named, "Susanne's Dress" as it is a combination of my mother's first and middle name. For pictures of Susan Karkazian's wedding dress, see figure 36 below.

Figure 36: Pictures of Susan Karkazian wearing her wedding dress at her wedding reception in 1982. Retrieved from Susan Karkazian, 2015.

Stage 3: Material Selection

The researcher decided to use tulle as the dominant fabric choice, since over 200 yards was collected from home, friends, family and remnant fabric stores. This was enough to upcycle Susanne's Dress. Besides using tulle, the researcher used discarded textiles at hand, including those collected from friends, family, textiles left over from old

projects, and those gathered from thrift stores. Below is a picture of some discarded textiles used in “Susanne’s Dress”. Refer to figure 37.

Figure 37: Discarded remnants researcher used for second dress design. (Picture taken by Talene K., January 2016)

Stage 4: Mood Board

Many mood boards were created in terms of upcycling specific areas. For example, the researcher had two mood boards for wedding dress back and front designs, and finally condensed them down to preferred styles that could work well with the second discarded wedding dress. Refer to figure 38, below, for final mood board selections.

Figure 38: Final mood board for Susanne’s Dress (Created by Talene K. March 2016).

Stage 5: Sketches

During the upcycling process, many sketches were created as ideas changed along the way. Below are sketches created before and during the upcycling process. For sketch examples, refer to figure 39 below, which is a developed sketching mood board that was used for Susanne's dress.

Figure 39: A mood board of sketches developed for Susanne's dress. Possible designs for top and bottom of Susanne's dress. Created by Talene K., 2016.

Stage 6: Upcycling the Wedding Dress

Before upcycling Susanne's Dress, pictures were taken of the original dress design prior to deconstruction. Refer figures 40 through 43 below.

Figure 40

Figure 41

Figure 42

Figure 43

Original construction of Susanne's wedding dress

Deconstruction of Diana's Dress

The first part of deconstruction was removing the puffed sleeves and the top material layer of the dress bottom. A seam ripper was used to help better guide the direction of the cut. This was important as certain floral detailing was chosen to be preserved. The top layer was cut with fabric scissors, leaving ten inches of extra material from the waist down. The dress was only deconstructed as much as it needed to be, as the base of the dress has to be strong enough to withstand extra weight that will be added during the upcycling process. The bottom layers were left alone, as they would be used to help attach the first layers of thick and heavy tulle pattern designs. Figures 44 through 46, below, are examples of this deconstruction method.

Figure 44

Figure 45

Figure 46

Deconstruction method

The back of the dress was altered. Over ten buttons were carefully removed starting from the bottom of the dress. The decorative flower patterns were slowly removed from the

waist of the dress, as a higher waist was going to be created with tulle. These decorative flowers and buttons were saved and used later in the design.

Created Patterns

In terms of sustainable design, using zero waste methods were used during pattern design and creation. All pattern pieces were cut and folded several times, adding thickness to each pattern piece of tulle. The researcher sewed each panel piece by hand, as tulle panel placement was vital to the design's outcome. For examples of this process, refer to figures 47 through 49 below.

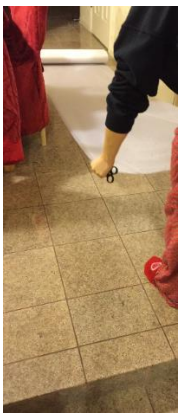


Figure 47

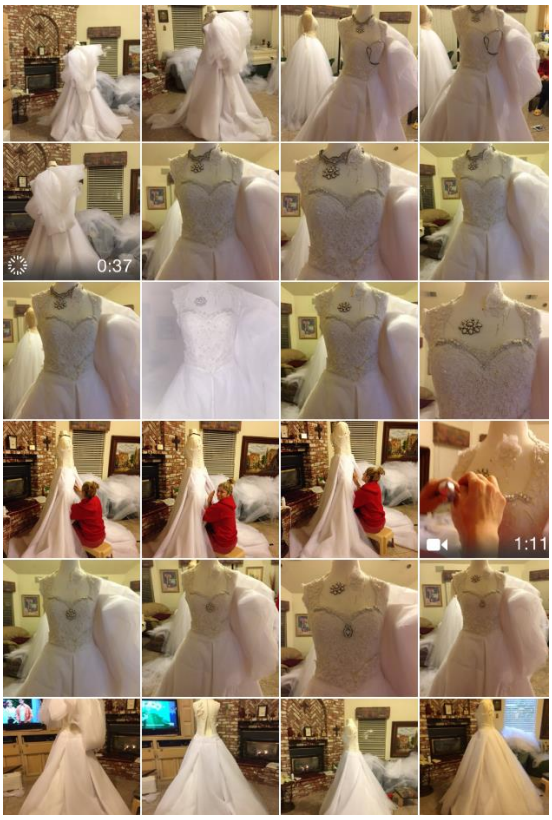
Figure 48

Figure 49

Process of forming tulle panels, hand sewing them into pattern pieces, and then pinning onto bottom portion of Susanne's Dress. (Taken by Talene K., April, 2016).

Mock up/Prototypes

Many prototypes were created before making final decisions on details of the finished design. After each prototype was created, pictures were taken and then turned into mood boards for the researcher to visually see how possible outcomes for the finished design. Figures 50 and 51 are some examples of the many mood boards created for the prototyping process of Susanne's Dress.



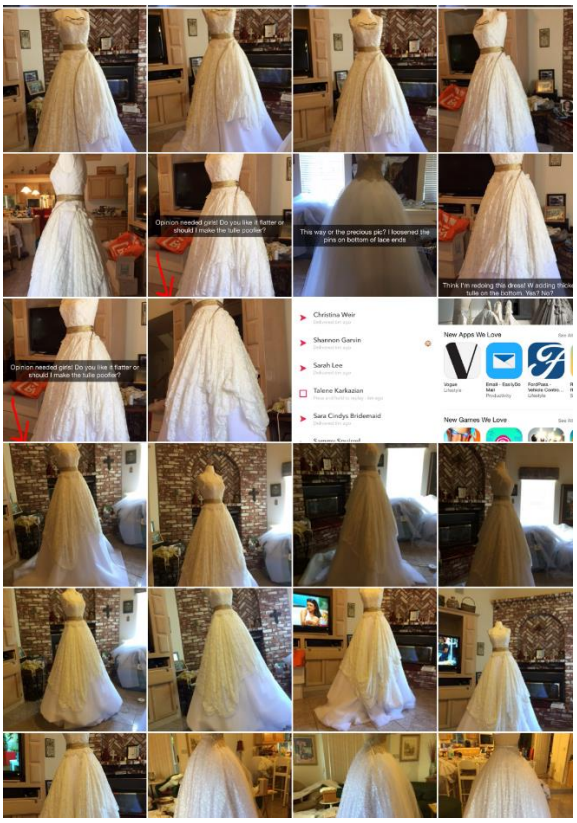


Figure 50

Figure 51

Mood Boards for Prototype development of Susanne's Dress

Finished Design

After analyzing mood boards of dress prototypes, a final decision was made for the design of Susanne's dress. When the final design was decided, more patterns were created, and temporary pins were taken off one by one as the researcher hand sewed each pattern piece directly onto the dress. This dress was more difficult to sew, than the first design, as the thickness of the tulle layers would sometimes be too strong for the needle to push through to the other side. Many needles broke in this process, and eventually a larger and stronger needle was used (on tulle fabric only), to help gather and secure all tulle. Figures 52 through 55, below, are examples of this process and figures 56 through 59 are pictures of the model who wore the dress design at the fashion show.

Figure 52

Figure 53

Figure 54

Figure 55

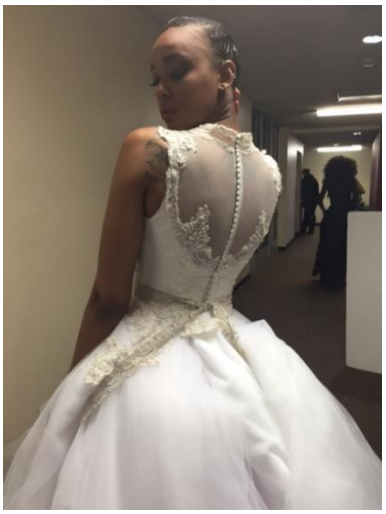


Figure 56

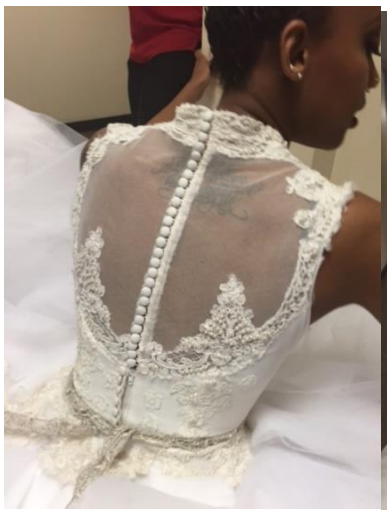


Figure 57

Figure 58

Figure 59

Evaluation of the Upcycled Designs

In regards to fashion show dress evaluations, upcycled dresses were displayed at CSUN's TRENDS fashion show on the evening of May 7, 2016. The upcycled designs were modeled at the end of the fashion show, and information was displayed on a large screen explaining the wedding dress collection. Along with the audience, undergraduate design students, and models, the five professional judges took pictures and were impressed with the couture designs that were able to come from two discarded dresses. Many models took pictures of the designs, while backstage, and exchanged information with the researcher for future contact. Figure 60 to 63, are pictures from CSUN's 37th annual TRENDS fashion show that were collected by friends and family who sat in the audience.

In regards to professional evaluations, over twenty professionals were contacted, and over ten provided their respected evaluation for each dress, including the following:

1. Designs were comparable to high couture fashion, designs were completely transformed and looked comparatively different than the original design.
2. Although professionals highly appreciated the detailing on both upcycled designs, they agreed that Susanne's dress was their favorite look, in terms of the concept to the runway.
3. When referring to the fashion show pictures, suggestions included adding more coverage to the mid-chest area of Diana's dress, possibly using a stronger discarded fabric that can carry the weight of any chest size, especially if the bride cannot wear a bra for support. Another suggestion was to alter and shorten the bottom of Diana's dress to proportionally suit the model on the runway.

Figure 60: Upcycled dresses on the runway at CSUN TRENDS Fashion Show

Figure 61: Model, Brenda, wearing "Diana's Dress" at the fashion show

Figure 62: Post Fashion show models posing

Figure 63: Wedding dress models sitting

Chapter 5 – Discussion, Limitations and Conclusion

The following discussion contains problems that were identified during the upcycling process and solutions that were used to resolve the situation. Limitations for this project are discussed, along with future suggestions on what changes can be made, altered or improved for the future of sustainable design. Finally, the suggestions from the professional were provided.

Problems in Upcycling Process

Altering certain areas of the dress caused an issue with the original boning and entire structure. Original boning, on each side of Diana's Dress, was cut down and altered along with the back of the dress. This caused a big issue with the top structure as it weakened the original base of the dress. Upcyclers tend to rely on the base of the dress as a strong foundation, able to withstand itself, in addition to the extra weight it will obtain from the upcycling process. The dress was originally designed to be strapless, but the missing boning along with the deep V cut that was first made, could not withstand itself without some type of support. The front top of the dress would not stay up on its own. Pins were added until an applicable solution was decided that would not harm or weaken the dress base any further.

Solutions: Originally designed to be a strapless dress, the researcher decided to keep working on the bottom of the dress, as over 50 pieces of tulle pattern pieces were created, pinned in a specific way, and eventually hand sewn to the base of the dress. To prevent any further damage to the dress, the first few layers of tulle were sewn onto the dress, and the other layers were sewn mostly onto the tulle. During this process, the dress was redesigned during one of the many prototyping stages of Diana's Dress. It was first decided to add a decorative halter strap, and the researcher decided to use her grandmothers' old fake peals for this solution. Luckily, the pearls

were temporarily pinned, because different straps were added once the researcher found out that the dresses were going to be on live models, and in the fashion show.

Limitations: Although the researcher tried several attempts to strengthen the dress along with keeping the original design, this was not possible with the resources available at hand. Original quality and structure of dress was not as strong as researcher first assumed; as this was the first time the researcher had ever created boning alterations.

Future Suggestions: The first suggestion would be to create designs that involve most of the boning. By keeping boning intact, it structurally prevents the base of the dress from losing any strength. Another suggestion would be to keep all frontal boning, create a sweetheart frontal design, as opposed to the deep V cut I made and altered in the front. This way the front is still altered with the boning structure and the back would slightly be altered, which would still support the frontal area of the dress.

Problems with Model Alterations

Dresses were upcycled on mannequins that were measured to 6'8", and both models were 5'9" tall. Models had 3" heels and this was also taken in to consideration, which added up to a total of 6 feet.

Solutions: The dresses were altered twice. The first alteration was sized down to 6'2", in case the 3" heels were miscalculated from information given. The dresses were altered again onto the live models on the day of the fashion show. This helped better fit the models and more accurate alterations were made. Dresses were altered down to 6' in the front only, so models would not trip and fall on longer tulle. When considering length, the researcher permanently altered the dresses, but left about five inches of length; in case anymore alterations needed to be made when fitting the models, for the first and only time, on the day of the fashion show.

Limitations: Designers usually have weeks to make alterations, and can usually have three or more fittings with the actual model. The researcher had four days to make find models, get their measurements and then alter their dresses accordingly. The researcher was blindly altering dresses, as these alterations were based off of measurements given by the models themselves.

Professional Evaluations and Suggestions

Future Suggestion 1: The stronger dress straps, altered to strengthen and support the models' chest, was a concern of an art professional who evaluated the collection. When referring to fashion show pictures, professional evaluators provided suggestions, including adding more coverage to the mid-chest area of Diana's dress. An art professional suggested that more material should have been added and reinforced to help support the chest area. She also included a picture of possible alternative designs that could have been added to help strengthen the top.

Future Suggestion 2: A sustainable design professional included notes on how to quickly make and adjust alterations, if required to do so, minutes before the fashion show. The first suggestion was to pack extra textiles, in case materials need to be added to the dress design after the model has the dress on. If materials were not packed, she suggested to then cut a piece of tulle from under the dress, where no one would notice, and use it to quickly create a belt that can also tie in the front. After creating a knot in the front center of the dress, under the chest area, the two tulle end pieces can lift up and over the chest area, creating another layer of support in a halter top strap style. Tulle was suggested because the professional explained that this was the strongest textile that could be used to properly add more support in the chest area for the model (based on what materials were available on hand).

Future Suggestion 3: A professional suggestion was to alter the bottom of Diana's dress to a shorter length, but only in the front. They suggested that the model wear taller shoes, or that the

front half should be tucked underneath and sewn or temporarily safety pinned to the dress. This can prevent the model from tripping over any long pieces of tulle in the front, and the back length of the dress can stay the same length.

Limitation 1: In regards to the first professional suggestion, the ideas were the most fashionable, but they were not the quickest fix a designer could make previous to a show. Although the drawing was beautiful, but the process would be too time consuming and the designer could possible hurt the model when hand sewing with a sharp needle and thread.

Limitation 2: In regards to the second professional suggestion, packing extra textiles was a good idea. However, the idea of using tulle (or the packed materials), may or may not work, depending on how creative and efficient the designer is at that moment in time.

Limitation 3: In regards to the third professional suggestion, altering the front of Diana's Dress would have been beneficial, but a designer may not have the extra time to make those alterations, when making alterations so close to the fashion show time. In regards to the safety pinning alterations, this was already a technique the designer applied a day before taking them to CSUN for fitting the models. However, this technique was not re-altered, because there was very little time left, and the model was comfortable walking with the length.

Conclusion

The global fashion industry is the second most pollutant industry in the world, producing insurmountable wastes in landfills due to increasing fiber production leading to increased wastes of textile and garment manufacturing. This increase in pollution has negative downstream effects on our planet's water supply and soil as well as for its people. Nevertheless, major western brands are still sourcing the cheapest of materials, while avoiding all responsibility for the growing cost to human health and the environment. As the fast fashion industry has rapidly

increased global consumption, it has also become the biggest pollutant in the fashion industry today with wedding dresses at the head of the pack.

Every sustainable method is inevitably unsustainable in one way or another. However, upcycling is a process that continues after the use phase, by upgrading the material or garment to create something that is valuable to consumers. In turn, this creates the usage of the same product in a more efficient way (Payne, 2011). Upcycling is the most sustainable method for designing because it is cost efficient and produces the least pollution. Upcycling wedding dress design has the potential to be not only highly profitable, but to help curb the uncontrolled waste production in the fashion industry.

Future Goals

Future goals include further research on the wedding dress industry; with aims to improve and publish this paper, lecture about sustainable design and eventually open a wedding dress boutique that would be called, *Playing Dress Up, Up-cycouture* or *Talene's Upcycled Couture.*

"Videos where designers talk about how a wedding dress is constructed and construction elements that are worth paying more for and those that are not essential could be posted on the designer's website with easy links for sharing with online community forums like Brides.com" (Thomas & Peters, 2011). I would like to continue my research, with aims to develop a website that allows women to view the whole upcycling process through pictures and videos.

This boutique would comprise of upcycled couture including wedding, bridesmaid and eveningwear dresses that are complimented with real jewelry and upcycled costume jewelry. Realistically, carrying this merchandise would be costly; however this is not a regular boutique as discarded dress purchases will be affordable, the researcher already upcycles costume jewelry,

and real jewelry can be sold from her family's' jewelry stores located in Fresno and Clovis, California. Merchandise will not be wasted; as it can be instantly posted on Etsy.com, Pinterest.com, Instagram, Snapchat or other social media revenues that may be more relevant to sustainability in the future. If certain items have been damaged or unsold, even after posting through social media, the merchandise can be upcycled again, or donated to any schools that are interested in sustainable design. This way, unsold dresses will still be appreciated and may never have to end up in a landfill.

In regards to general marketing techniques, like flyers or ads, the researcher will recruit some friends and family to come model the clothing, and pictures can be taken during this real experience. In turn, having friends and family over to act as themselves, is a great way to naturally have a photoshoot and doesn't cost anywhere near the price of a professional photoshoot. In addition to this idea of low-cost smart marketing, the researcher would also like to create and post videos through social media, including the upcycling process of each discarded dress. Each dress will have a price tag, including a story about the upcycling process it went through and a picture of its original design.

In regards to service, alterations and custom dress upcycling will be available. Customers can bring anything they would like to have custom made or upcycled. First, the customer will bring in any items they want to have upcycled. The designer, along with her amazing sewing team, will decide if the original items can withstand the upcycling process. If they can use these items, the customers will be given three different prices, based on sewing time, materials used and detailed embellishment hand sewing. The researcher would love to create this business in a sustainable and efficient environment, as long as it promotes sustainability and creates happiness.

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