

4-1-2011

Can This Outfit Make Me Toxic?

Alana Shuma
College of DuPage

Follow this and additional works at: <http://dc.cod.edu/essai>

Recommended Citation

Shuma, Alana (2011) "Can This Outfit Make Me Toxic?," *ESSAI*: Vol. 9, Article 36.
Available at: <http://dc.cod.edu/essai/vol9/iss1/36>

This Selection is brought to you for free and open access by the College Publications at DigitalCommons@C.O.D.. It has been accepted for inclusion in *ESSAI* by an authorized administrator of DigitalCommons@C.O.D.. For more information, please contact koteles@cod.edu.

Can This Outfit Make Me Toxic?

by Alana Shuma

(Biology 1110)

As a person heads to the store to buy a piece of clothing, there are usually two things considered: first, does this look good on me and second, can I afford this? This paper looks at how consumers' knowledge of clothing quality has changed, the history of how man-made fibers impact the clothing industry, and the pros and cons of various organic fibers including their environmental impact. The relationship between the environment and economics is debated by examining how the fashion industry views and markets eco-friendly fashion.

Why Clothing Matters

Clothing is used not only as a form of modesty, but as a means of personal expression and protection. Different types of clothing offer different forms of protection against the ultraviolet rays of the sun as well as warmth against freezing temperatures which can cause the bodies harm. The expectation of clothing as protection against the environment is normal, but consumers are typically unaware of how clothing dyed with chemicals can be toxic to the environment and health. A person has to read the clothes tag to learn about the garment's care while purchases are based on cost rather than quality and craftsmanship.

Until the late 19th century all clothing was made from all organic natural fibers: wool, flax, cotton, hemp and silk (Handley 1999). Young children and teenagers were involved in 4-H programs where they learned about natural farming practices that involved growing crops without pesticides. Females were enrolled in Home Economics class where lessons involved different types of fabrics and how to sew which resulted in women learning to distinguish between a poorly made garment that would not last versus a garment made from quality fabrics. These lessons were passed on as late as 1965, when Muriel Humphrey, wife of Vice President of the United States Hubert Humphrey, made the dress she wore to the inauguration (Handley 1999). A personal hand sewn outfit made for an important function is not part of today's society unless the hand sewing is done by a skilled seamstress working in a couture house. As the consumer understands less of how a garment is made, the higher the possibility that the clothing is less natural and more toxic.

Since clothing had always been made from natural fibers, the idea of turning chemicals into fibers was not discovered until the late 1800s. In the late 1890s, Count Louis Marie Hilaire Bernigaud de Chardonnet, known as the father of artificial silk, perfected the nitrocellulose process (Handley 1999). The patent for viscose rayon began the fascination with chemical fibers that would expand into household goods and clothing. In the early 1900s, the Du Pont Company, working on a chemical material to keep up with car productions, was also made from viscose and became known as rayon (Handley 1999). Rayon, introduced as nylon, was cheaply woven hosiery fabric which made stockings accessible to the average woman since hosiery had been made from expensive silk that would tear easily. Nylon was the new man-made fabric that was made from coal, water and air; and had very fine, elastic fibers (Handley 1999). Nylon rivaled the silk market because the price of silk varied whereas the price of nylon was steady. The affordable pricing made nylon a success without a consideration to the environment. Although nylon was originally used for women's hosiery, when the United States entered World War II, the imports of wool, silk and linen were cut off, and it was nylon that kept Americans from having a clothing shortage during the war (Handley 1999).

Following the war, new man-made materials, acrylic and polyester, became part of the American textile industry which was made possible because of the raw materials that were available (Handley 1999). The traditional fiber industry suffered because the new fabrics did not need ironing, were light-weight, stain-resistant and low cost. The American textile industry switched from a dependency on coal, limestone, cellulose and molasses prior to the war to a post-war dependency on oil (Handley 1999). Availability of non-organic oil started the rivalry between synthetic and natural fabric designers which became a battle of economics rather than a cause to care about the environment or the consumer wearing the clothing. There are hundreds of man-made, non-organic fabrics today.

The synthetic fabrics industry also brought about changes in the use of natural elements used as accessories. No longer were actual wood, stones, and glass being used as embellishments since replica items were now being made with plastic (Handley 1999). The fakeness of fibers was celebrated in the 60s as people felt they were being ethical by not wearing real fur or animal skins while being ignorant of the environmental costs of the synthetic pollutants.

Different Types of Fibers

A piece of clothing does not begin when a pattern is cut from a piece of fabric (Earth Pledge 2007). The fibers of both synthetic and natural sources that become a piece of fabric involve many stages. The first stage involves the fiber production. Whether chemicals are used, land and sustainability, and the treatment of animals are all considered during this process of production. The second stage involves yarn spinning in which energy consumption, waste by-products, and the materials used to process the fibers (including dyes) are considered in whether this stage is environmentally friendly. The third stage involves the production of fabric. Considerations involve energy consumption and the completion of the dye processes. The final step involves post-production transportation of the fabric to the manufacturing plants and then consumers. When looking for a piece of clothing that is considered eco-friendly, all these steps are taken into account. Several different fibers offer sustainable, non-toxic options for clothing options.

Bamboo, the primary food source for panda bears, is a sustainable grass (Earth Pledge 2007). It grows a meter per day and, unlike a tree that needs twenty-five years to re-grow, bamboo can be harvested in four years. The fibers of the bamboo plant have many of the same characteristics of cotton. In addition, bamboo is antibacterial, has a low absorbency rate, is hypoallergenic and offers ultraviolet protection (Earth Pledge 2007). Clothing made from bamboo is extremely soft and sheds dirt well making it an easier textile to clean. Bamboo is a highly-demanded commodity in fabric and furnishing opportunities; for example, Target, along with other convenience stores, has a line of sheets composed exclusively of bamboo. Although bamboo does not need any chemicals to propagate and mitigates water pollution naturally, there are no bamboo crops in the United States, and bamboo is currently imported from China as a man-made fiber with no organic standards (Earth Pledge 2007).

Hemp is a hardy weed able to withstand even harsh environments. Formerly allowed to be grown in the United States, Thomas Jefferson held the first U.S. patent on processing hemp (Earth Pledge 2007). Hemp is a high yield crop that requires little or no pesticides and requires one-fifth the amount of water than cotton. It is a vegetable that is biodegradable, renewable, and it removes five times the amount of carbon dioxide than trees. Although hemp is an environmentally friendly fiber, unfortunately, it has negative opinions associated with it. The United States has a ban on growing hemp so hemp grown for industrial purposes is produced in China, Romania, Russia and Poland (Earth Pledge 2007). Calvin Klein, Giorgio Armani, and Stella McCartney all use hemp in some type of their clothing collections.

Cotton is one of the most chemically dependent crops in the world. Most of the cotton crops in the United States are grown from genetically modified seeds and 70% of those crops are

chemically dependent. Producers in the United States claim that a smaller yield organic cotton crop cannot meet all the needs of the textile industry; thus, the use of a bioengineered cotton plant is necessary (Scaturro 2008). One of the most common pieces of cotton clothing is denim. To dye conventional cotton, it takes 100 gallons of water and generates toxic waste that costs approximately \$2.00 per pound of cotton to clean up (Earth Pledge 2007). Although DDT is no longer allowed to be used in the United States, there are counties where U.S. cotton is mixed with other cotton that has been sprayed with DDT and then made into clothing that is imported back to the U.S. Organic cotton sales are projected to be \$2.6 billion by the end of 2008 (Earth Pledge 2007). Sales of organic cotton items are now being sold in stores like Wal-mart, H&M, and Timberland. Organic cotton can be grown in different colors ranging from green and brown and can be dyed different colors (Black 2008).

Silk has been around for thousands of years and is considered to be a fabric of luxury. The silkworm is no longer confined to China, and is a precious fabric that developed international trade along the famous Silk Road from China through Asia, Africa, the Mediterranean to Europe. The silkworm secretes a protein which is spun into its cocoon. One cocoon can yield one mile of silk (Black 2008). Since silk is biodegradable, it is considered eco-friendly as long as the dyes used are natural. The latest controversy in silk manufacturing is that some countries are forcing families, including children, to take care of silkworms during their breeding stage which is a twenty-four hour process for approximately one month. The worms must eat seven times a day or they will die (*Daily Herald* 2010). Since there are not any international standards regarding child labor laws, knowing if a garment is made with silk from a country forcing silkworm breeding is unavailable.

Linen has clothed men and women since the beginning of time. This cloth is made from the stems of the flax plant, creating a strong and durability textile. Linen is considered an expensive fabric because of the high cost to produce it. Although an organic fabric, many linen fabrics are now coated with resins or formaldehyde compounds so that they are less likely to wrinkle (Black 2008). Other natural fibers being using are: coir, sisal, jute, banana, nettle, coconut, seaweed, daisies, raspberries, carrots, poppies, mint, roses, vine stems and paper as fibers to make fabrics (Black 2008). The opportunity to develop clothing using renewable resources is an exciting prospect for the environmental movement.

Animal skins and hair are traditional options used for warmth and protection. Animal hair fibers used for warmth come from fauna such as alpaca llama, cashmere mountain goat, and sheep's wool. Wool has been a staple in the clothing industry for centuries. With animal welfare rights a concern for many people, obtaining wool from a sheep is more than just raising sheep on a farm and sheering it. In certain parts of the world, sheep-dipping, known as mulesing, has become a problem. Sheep-dipping involves dipping the sheep in pesticides to prevent the sheep from developing diseases (Black 2008). The alpaca llama fleece has been used as a fiber dating back to the Incas and has now evolved into a lightweight, strong, warm clothing item (Black 2008). Cashmere is an expensive, soft, luxurious fabric made from the hair of the cashmere mountain goat. Cashmere is the fine undercoat that must be brushed frequently during the molting season of the goat (Black 2008). Because of the expensive nature of cashmere, the worry among farmers is that people will cross breed the goats to try to get a higher yield of hair. When most people think of animal skins, they think of cowhide. Leather processed in modern tanneries uses a chemical process involving chromium which is toxic to humans. This toxicity is why 95% of U.S. tanneries have moved overseas so they do not have to comply with EPA regulations (Earth Pledge 2007).

What Is a Fabric

There are different terms used when classifying fabric. The term natural is considered a fiber has been harvested and produced with a minimal amount of human processing. These fibers are cotton, wool, silk and linen. While a fiber can be natural, it is not necessary organic unless it is

certified by the Organic Trade Association. Although there are no fibers that have zero impact to the environment, an eco-friendly fiber has at least one major step of processing that has less of an environmental impact compared to its conventional counterpart. Examples of eco-friendly fibers are bamboo, soy, hemp and organic cotton. Eco-friendly fibers normally use little or no pesticides (Earth Pledge 2007).

The dyeing process of conventional fibers sends a huge amount of dioxins into the environment. There are 1,600 chemicals used in the dyeing process; however, only sixteen are approved by the EPA. Chemicals can cause environmental and personal issues. There are bioaccumulation affects of flame retardant chemicals in clothes that can show up in humans. Chromium and cadmium are heavy metals that are used to make dyes bright and vibrant; however, the hazards posed by these chemicals range from chronic health hazards to skin irritations. Knowing that natural dyes can be made in a variety of colors and do not cause environmental or human hazards is cause to question why hazard chemicals are still used in the clothing that touches our bodies (Earth Pledge 2007).

In Conclusion

With hundreds of fashion designers who have an opportunity to make an environmental impact on the industry, very few designers have embraced this opportunity. Designer Issac Mizrahi created *paillettes* from wild-caught salmon. The *paillettes* were used to cover a dress used in an exhibit at the Cooper-Hewitt, National Design Museum in New York (Glausiusz 2009). A line of carbon neutral conversational neckties have been introduced by fashion designer Nicole Miller that are designed to spark discussion on environmental issues even though the ties are made in China and made of only 30% recycled silk (Patton 2009). Stella McCartney has made eco-friendly pieces a part of her collection as have Calvin Klein and Giorgio Armani have added hemp pieces to their collections. Other aspects of sustainable fashion include celebrity Natalie Portman who has a line of vegan shoes (Vartan 2008).

Looking through the August 2010 issue of *InStyle Magazine*, there are 275 pages with two mini articles about eco-friendly ideas not related to fashion and one question and answer article about not wearing leather. The magazine does a disservice to readers; however, when directed to an option to leather, the answer directs the reader to purchase products made from PVC (polyvinyl chloride), a phthalate, rather than an eco-friendly alternative. The first advertisement in the magazine is a multi-page spread for The Gap which does not mention anywhere that they are using sustainable cotton in their clothing. There was one eco-friendly advertisement toward the back of the magazine for cosmetic items. Nowhere in the issue was there any distinction made if a piece of clothing was eco-friendly or not. Individual items were labeled (e.g., silk, rayon, etc.); however, these labels do not guarantee or determine whether than item is eco-friendly. In several places fashion pieces by Stella McCartney were shown; however, if a person is not aware that she has a line of green clothing, this information is just another designer name. The fashion industry needs to embrace designers who are willing to work with these resources to support their efforts. Popular magazines can embrace these efforts by featuring designers so consumers can learn about different types of eco-friendly fashion rather than featuring the same designers every month.

The opportunity to purchase eco-friendly clothing can be done on-line and at a small number of stores. Another option considered environmentally friendly is the wearing and purchasing of second-hand vintage clothing. As the economy has made extravagant clothing purchases prohibitive, wearing designer clothes from previous decades is a viable alternative to new apparel. Less consumer consumption and environmental protection are admirable reasons to consider and purchase vintage clothing. From an environmental side, the care needed for the garment also needs to be considered as part of its impact. Does the garment need to be dry cleaned or can it be hand washed with a phosphate free detergent? Wearing eco-fashion is not always as easy as it seems (Beard

2008).

A lifestyle that includes non-toxic, non-polluting faces many challenges. First, finding clothing that is readily available can take considerable time and effort since these items are not readily available. In addition, it can be cost prohibitive if it is necessary to shop on a budget since these items are not as inexpensive as clothing in big box stores such as Target or Walmart; however, these clothes are usually of higher quality and will last longer. Determining whether a piece of clothing is actually eco-friendly can be confusing since there is not an industry standard. For working men and woman, professional and conservative, fashion-forward clothes are a necessary convention in the business world. Non-toxic, organic clothing needs to be produced in a variety of styles and designs to suit the needs of a variety of people and circumstances. Proper information and education on the health benefits of non-toxic textiles can convince the average buyer to modify their buying habits; it take a change from both the clothing industry and consumers to transform the way clothing is manufactured.

References cited

- Beard N. 2008. The branding of ethical fashion and the consumer: a luxury niche or mass-market reality? *Fashion Theory: The Journal of Dress, Body & Culture* 12:447-467.
- Black S. 2008. *Eco-Chic the Fashion Paradox*. Black Dog Publishing, London.
- Daily Herald*. 2010. Silk's dark side: Uzbek's kids made to grow cocoons. Associated Press.
- Earth Pledge. 2007. *Future Fashion White Papers*. Greg Barber Co., New York.
- Glausiusz J. 2009. Sustainable fashion. *Nature* 459: 915.
- Handley S. 1999. *Nylon the Story of a Fashion Revolution A Celebration of Design from Art Silk to Nylon and Thinking Fibres*. Johns Hopkins UP, Maryland.
- InStyle Magazine*. August 2010. Time, Inc., New York.
- Patton JR. 2010. Ties to get you talking. *E* 20:57.
- Vartan S. 2008. A case for eco-fashion: eco-couture is changing fashion for the better. *E* 19:33-34.