The Sustainability of Fast Fashion

Yu Jin¹, Zeyu Chen², Yunqi Chen³, Chenlin Gu⁴,*

¹University of California, Irvine, CA, 92612, United States;
²Ohio State University, Columbus, OH, 43210, United States;
³University of Miami, Miami, FL 33143, United States;
⁴Stony Brook University, Stony Brook, NY 11794, United States.

*Corresponding author. Email: gcllynn@gmail.com

Abstract

The fashion apparel industry has grown dramatically, and its shifting dynamics have pushed retailers to look for lower costs, more rapid market pace, and key tactics in the increasingly demanding market to retain a sustainable role, along with low cost and marketing mode of fast fashion, product quality problems and unsalable surfaced. In order to solve this crisis brought by fast fashion, the brand suppliers come up with the corresponding market optimization policies. Meanwhile, fast fashion brings unprecedented sales and power to the market, pollution and chemical waste will inevitably be produced in the production process. Some of the wastes will cause damage to the environment and human body. For the feasibility of sustainable development, we should appeal to not only producers but also consumers to pay attention to this matter. Among growth in economics and domination of sale skills, environmental and health problems are questioning long-term development of factories. In this paper, we discussed the sever pollution problems brought by fast fashion factories and solutions for market sustainability.

Keywords

Fast Fashion; Product Quality; Environmental Sustainability; Fashion Market; Promotion Method.

1. Introduction

The current fashion industry has dramatically evolved with the transition from a production-driven to a market-driven circumstance in the fashion industry facilitating the growth of a new and quick fashion trend, which is fast fashion. From the past, traditional fashion retailers concentrated mainly on predicting consumer demand before the time when consumers actually consumed. However, many recent fashion retailers prefer to focus on the speed to move fashion trends from fashion shows or runways to the stores. Subsequently, fast fashion is contributed by the increasing mass production of affordable fashion lines to reach the demands for the rapid shifting trends. Mass production like this might be a positive thing at first sight. As it has proceeded for years, however, it has been causing much more problems than it has been solving. For instance, a large number of fast fashion production factories are immoral and harm their front-line workers with mistreatment including extremely poor working conditions, low wages, and dramatically overtime working. Additionally, according to Global Labor Justice, garment workers, especially female workers, in H&M and Gap supplier factories in Asia are currently facing over-exploitation. Moreover, fast fashion production creates tons of polyester pollution to rivers, lakes, and oceans. Specifically, every time those products are washed in washing machines, microfibers from the garments are released into waterways and bring a disaster to
wildlife living in waterways. More garments produced means that more garments are wasted as well. The phenomenon that people currently do not keep their clothes as long as they used to also provide a sensible explanation of why fast fashion has resulted in numerous excess inventory and waste. Those problems mentioned above are just icebergs compared to all problems caused by fast fashion industries. Hence, it is extremely crucial for us to realize the importance of sustainability in fast fashion industry and how it has been dramatically influential to the fast fashion business.

2. A sketch of the fashion apparel industry

Throughout the last two decades, various and dramatic changes in the business of the fashion apparel industry have contributed to intense evolution encountered by the fashion apparel industry globally. When it comes to the research of the fast fashion industry, interpreting how the process has evolved is an inevitable step. As the term of fast fashion is considered to be established since the early 1990s, the following sections depict those changes that have taken place in the fashion industry since the early 1990s.

2.1. Fashion cycle and seasons

As fashion is defined as a temporary periodic phenomenon that is embraced by customers for a specific period [1], it becomes conspicuous that the cycle of fashion is smaller than it actually seems. Generally, the life cycle of a fashion apparel trend can be split into four phases as shown in Figure 1, which are introduction, acceptance, maturation, and finally rejection.

Starting with the introduction stage where fashion leaders or so-called innovators adopt and spread the new trend, it proceeds to the acceptance stage where part of the consumers, early adopters, begin to follow up and thus results in a rise of the trend approaching its climax, which the trend is accepted by the majority and is called the maturation stage. After the peak point, the trend slowly declines to reach the rejection phase which leaves the late majority or laggards and then eventually the obsolescence of the fashion trend. During the 1980s, the fashion calendar was concentrating on fashion shows, trade affairs, or exhibitions that represented the pattern of Spring/Summer and Fall/Winter ranges.

At the beginning of 1990s, however, some fashion apparel retailers commenced to focus on enlarging their products range with the up-to-date products. Their primary concern was how to move the newest fashion trends to the stores as fast as possible. Hence, to increase the diversity of the products, attaching more seasons apart from Spring/Summer or Fall/Winter...
becomes a new direction for the fashion apparel industry. For instance, Liz Claiborne, a famous fashion designer, has added two more seasons for womenswear and one season for menswear as expecting to work out one season every two months [2]. The adding more seasons concept is established mainly due to the changes in consumer’s lifestyles and their demand for fashionable clothing for different occasions.

2.2. Industry structure and supply analysis
At the beginning of the 1990s, the market competition extent in the fast fashion apparel industry was extremely high because of the power and domination of several enormous retailers like Zara. To survive under such predicament, smaller businesses came up with the idea of promoting their brands by cooperating with suppliers from other markets [3]. This unprecedented proposal turned out to successfully assist them with making a decent profit by associating with manufacturers overseas. The core objective of utilizing overseas factories is to reduce lead times (time between the initiation and completion of a producing process) and maintain their low costs. Since then, cooperating with overseas manufacturers has become a viral trend in the fast fashion industry.

Regardless of the success when the idea first came out, sometimes it works adversely that it actually increases both the lead times and production costs. By overseas manufacturing, firstly, the geographic distances render the production process much harder. Inconsistency can easily occur between the fashion designer and the manufacturer since the geographic distances limit the effective communication. For example, digital images can vary a lot from what the product actually looks like as sometimes it distorts the colors or the silhouettes. Consequently, designers can only view the "real" look of the product once the product is shipped which may lead to a rework of the product that is time wasting. The other reason is transportation. There exist unpredictable and immeasurable uncertainties during the transportation process. An obvious one related to the import and export procedure is the local regulations. The cost of transporting products varies significantly with the fluctuation of the import and export tax. Additionally, money spent on carrying inventory is also a huge cost.

3. Quality of fast fashion products
Fast fashion’s rapid update speed of the new season clothing industry itself has brought many problems. In order to meet its speed of update new season clothes and the demand for a large number of products, fast fashion shortens the time for new clothes to be updated on the shelves and makes strategy accelerates the speed of product sales. Then fast fashion lowers the price to attract consumers, so that effect fast fashion brands have control the price, such as fixed cost, production cost, labor cost and material cost. Different brand chooses to low different kind of cost and will cause corresponding problem and dilemma.

3.1. Low material cost and labor cost will cause the problem in quantity of clothing.
Low price labor force cannot guarantee the work quality and working ability of labor. That means, there are not only the adult labor force, but also the child labor force and the elderly labor force. That kind of labor force will cause a lot of mistakes, such as comes apart at the seams, or the threads come undone, since those labor

Low material cost limits the selection of clothing material. The fast-fashion brands consider using cheap materials like synthetic fabrics, which many factories use toxic fabric to produce, even some of the fabric are considered carcinogenic. Since human skin is porous, these chemicals are able to easily seep into the skin and cause dire health conditions [4]. Thus, cheap materials increase the risk of skin disease or even cancer. Also, polyester is very popular for fast fashion brand to use as material because of cheap price, and that is the worst clothing
material. It is made of plastic which releases micro-plastic to our water systems when washed. Polyester is not breathable which means that you get all sweaty under it [5]. Thus, when consumers wear clothing from fast fashion brand in hot summer, consumers would feel very uncomfortable.

3.2. How fast fashion increase quantity to achieve sustainability

With living and economic condition becoming better, consumers begin to pursue high-quantity life. They are going to abandon poor quality clothes. In order to achieve sustainability, increasing quantity is essential for fast fashion brands. UNIQLO, which is committed to clothing comfort, has made a great leap in sales in recent years. UNIQLO’s clothes seemingly ordinary, but has many innovative technologies, the quality and comfort of clothing have been greatly improved. One of its unique innovative technology called HEATTECH can convert the water vapor emitted by the human body into heat for keeping warm, which also makes UNIQLO’s winter clothes increase sales. Furthermore, in order to get high-quantity material at low price, UNIQLO orders the material by large number and negotiate with manufactures. UNIQLO’s elastic sports material clothing has also been greatly welcomed by the market because of its softy and comfortability. UNIQLO also cooperates with high-quantity manufacture. UNIQLO procures specific spinning and dying denims from Kaihara corporation, Japanese denim fabric manufacture [6]. Those strategies make UNIQLO produce high-quantity clothes and stand out in fast fashion market.

3.3. Stock of fast fashion

Fast fashion establishes commercial model that can be used to launch fashionable clothes exhibited in fashion show in a short time. That feasible makes their product in a short selling time. After the brand offer new season clothing, it is very hard to sell the “over season” clothes, since the new season clothing is more popular. The cumulation of over season clothes become a serious problem for fast fashion. Thus, some brands make strategy to reduce the number of over season clothes in stock.

3.4. Reduce the number of shipping clothes to stores

Zara is very accurate in the distribution of goods in the store. According to the sales situation of each store, the headquarters takes the initiative to allocate goods. The design team in the headquarters can clearly see what kind of style, color and size are needed for each single store, each city and each region, as well as the approximate quantity of each replenishment. Furthermore, Zara’s success relies on keeping a significant amount of its production in-house and making sure that its own factories reserve 85 percent of their capacity for in-season adjustments [7]. In-house production allows the organization to be flexible in the amount, frequency, and variety of new products to be launched. Zara holds an order meeting every three or four days. This ensures that Zara has a basis in production quantity and will not blindly press goods into the store. Even if there is stock in the store, consumers will not put forward the clothes that have been removed from the shelves and want to buy them. This creates a sense of scarcity for consumers, making them feel that Zara’s clothes will not have this store after passing through this village.

3.5. Discount activity

In order to clear the inventory, gap has set up a variety of discount forms. In addition to the common single product discount, it is often used in the form of "buy more and get more discount". This kind of discount has attracted a large number of people to the store. In the discount activities, the number of customers in the store is at least three times of that in the non-discount period. Moreover, consumers are immersed in the discount and prefer to buy average three or more in such discount. At this time, customers have forgotten the original
intention that buying things is whether they need it. Thus, it stimulates consumers to buy more than one garment in shopping. A large number of people buy a lot of clothes, which can help the brand to clear the inventory at a very fast speed. Make these out of season clothes sold in the form of bundling with low prices.

4. Marketing Method in Fast Fashion Market

Since styling becomes more popular around different ages and body shapes, fashion frequently appears during people’s daily lives. People want to spend more money on dressing up themselves and show their styles. However, not everyone can afford the high price of luxury fashion brands. So, people choose to buy some cheap but high-quality clothes. Fast fashion can fit their demand by producing lots of low-price styles to fit every group of people. The main question of every fast-fashion brand is attracting more customers in this competitive market when they all have good-quality clothes.

4.1. Pertinence customer group & promotion methods: Brandy Melville & Hollister Case

Different groups of people with different styles and body shapes are interested in fashion, and some brands design new clothes focusing on the specific style and body shape. The most typical example is Brandy Melville. This Californian lifestyle-inspired retail company has become increasingly popular among teenagers [8]. As social media has become the platform that the young generation communicates their ideas with others, Brandy Melville chooses to manage its social media account first. One of the most creative marketing decisions they made is finding the Instagram bloggers who fit their brand style and shoot with them. Moreover, they upload those pictures to their own Instagram account, tagging the model’s account. As those bloggers have their fans, Brandy Melville can expand their popularity around new groups with the same style. The brand’s official, US-based account @brandymelvilleusa has more than 3.8 million followers (October 2020). Furthermore, they can have larger groups of customers gradually through this method. They also hire part-time brand representors with the same style as Brandy Melville in the store as sales and cashier. The way they match clothes can give customers inspiration on buying clothes as a set. Sometimes, they select some brand representors as their models to shoot the Instagram photos and look book. Another tricky marketing method is sending colorful logo stickers to the customer when they order online. Lots of girls love those stickers and stick them on the computer or wall. It is tricky but valid to increase their online order numbers.

On the other side, Brandy Melville is also known for its controversial one-size-fits-most policy: the majority of the clothing only comes in one size. Most pieces are tagged with ‘one size’, ‘XS’ or ‘small’, with an exception of selected bottoms, which come in a few different sizes [8]. Since this sizing policy is extreme, there have been arguments around media. Some girls choose to diet extremely for dressing up Brandy Melville tops and bottoms. However, it does not affect order numbers. Hollister Co. is the brand opposite to Brandy Melville. They have all sizes for their pieces: XXS to XXL tops and waist 23 to waist 32 for girls’ jeans. They are the competitor to Brandy Melville; both from California, and the target customers are teenagers. They use the opposite way on promotion to Brandy Melville. All size pieces and the decoration of the store have their Californian style, which attracts more customers. Also, Cal cologne scent is sprayed directly on Hollister’s clothes gently, which can attract customers who love perfume, and this is a suitable promotion method fully represent their brand style. Moreover, the In-store model is Hollister’s main promotional strategies. The in-store model strategy made Hollister totally different from other clothing stores [9]. Hollister is a brand accepting different culture and body shapes, which can be seen from their look book containing models with several skin colors and body shapes.
4.2. **Jointly-designed: UNIQLO Case**

Jointly-designed is a common promotion method for the fashion market during these years when social media becomes popular. Jointly-designed can target the customers of two fan groups from two brands separately. People who cannot afford luxury brand pieces' prices choose to buy the jointly-designed pieces cooperating with fast fashion brands. The price of those pieces is much lower than buying designer brands. The most typical example is UNIQLO. UNIQLO loves to design the plainest and lifestyle clothes and bottoms. The primary promotion method of their brand is cooperating with luxury fashion designers. Early in 2009AW, Jil Sander cooperated with her signature modern style with UNIQLO and published the +J collection. UNIQLO cooperated with several individual designer brands during these years, such as Undercover, Theory, Kaws, and Lemaire who is the design director of Hermès. Also, they cooperate with some idols such as Billie Eilish, Takashi Murakami. Moreover, they target teen generations by cooperation with Disney for years.

All of those cooperations bring large profits and order numbers for UNIQLO. The jointly-designed clothes with Kaws sell more than ten thousand on the first day. The annual sales in China approach 700 million.

5. **Fast Fashion and Environment**

Fast fashion is used to describe popular and cheap fashion-style. Its design changes with the new international style and the update of fashion trends. In recent years, the rise and development of fast fashion show that the world’s demand for quick consumption increases by a large margin. Globally, 80 billion pieces of new clothing are purchased each year, translating to $1.2 trillion annually for the global fashion industry [10]. To meet consumers’ needs and enlarge the market share, retailers quickly transform the design of t-platform to store, providing consumers a cheaper way to get a close touch with luxury fashion. With globalization, retailers can set up factories and shops everywhere to make profits and expand the market. The internationalization of the supply chain has shifted the manufacturing of fibers, textiles, and clothing to cheaper labor areas.

The huge demand has led to an increase in the number of factories, especially in countries with cheap labor. However, mass production brings too much production waste and toxic substances after processing. For example, synthetic fibers can flow into waterways through the drainage system and affect water quality and resources. Rayon, as Dr. Paul Blanc says, long-term exposure of rayon producers to carbon disulfide can cause serious health problems, such as Parkinson’s disease, early-onset heart disease, and stroke.

5.1. **Pollution During Production**

Unlike luxury brands, which use silk or hand-made garments, fast fashion factories produce massive clothes simultaneously. The most commonly used textiles are human-made fibers, such as polyester or viscose. These synthetic fibers stretch well, dye easily, and cost less than one-tenth of silk. Approximately 90% of clothing sold in the United States is made with cotton or polyester, both associated with significant health impacts from the manufacturing and production processes [10]. Polyester contains macromolecular compounds produced by the polycondensation of organic dicarboxylic acid and diol. The wastewater treated with these fibers will include many ultrafine fibers, which will cause irreversible pollution to the water quality of rivers and oceans and deposit in the body of aquatic organisms. According to new research, microfibers are the major marine pollutant worldwide, estimating 13 million tonnes of coastal synthetic fabric waste entering the ocean each year, out of which 2.5 million tonnes enter through adjoining rivers [11]. Since Fiber microparticles are non-biodegraded, the more fibers animals eat, the more they accumulate in their bodies. Therefore, these particles will
eventually enter the human body through the food chain. Even if they do not contain toxins, they will be harmful to health after continuous accumulation. In addition to the direct pollution caused by artificial fibers, dyeing fibers' by-products can also lead to various decay and diseases. Since the rise in production, the demand or human-made fibers have doubled in 15 years, which leads to a more considerable amount of usage in crude oil and releasing emissions, including volatile organic compounds, particle matter, and acid gases [12]. In the process of fiber dyeing, massive toxic gases are produced, such as chlorine, carcinogen, which evaporates into the air and is absorbed by the skin or lungs. Inhalation of chlorine may lead to acute respiratory diseases, severe respiratory injury, and even irreversible damage to eye mucosa. The toxic gas will disturb cells' normal functioning and cause alteration in animals' physiology and biochemical mechanisms, resulting in impairment of essential functions like osmoregulation, reproduction, and even mortality [13]. The disease is even hereditary and can cause injury or deformity before a child is born.

5.2. Solution for Sustainability
After the fast fashion business model has become the norm of big fashion brands, the increasing demand for a large number of cheap clothing has led to the deterioration of the environment. As global enterprises, sustainable development should be reflected in operation and profitability and environmental protection and energy conservation. Environmental damage is not just an event that a single country or region needs to consider. For the fast fashion industry, it is essential to reduce overproduction and use environmentally friendly materials. Factories can use natural fiber or protein fiber instead of artificial fiber. Lyocell, made from the cellulose of bamboo, is made in a closed-loop production cycle in which 99% of the chemicals used to develop fabric fibers are recycled [10]. Simultaneously, every enterprise should have stricter treatment standardized requirements for production and apply advanced equipment to treat the waste. For example, Wd-TENG is a new cleaning system that can recover kinetic energy from flowing wastewater by self-power supply and conduct electrochemical degradation of degumming wastewater. It can remove 90% of pollutants in sewage within 120 minutes, widely used in the textile industry as innovative green technology [14]. Promoting environmental protection will help to achieve sustainable production and consumption.

6. Future research related to fast fashion
As reviewing published articles tackling environmental perspectives of fast fashion, it shows that generations have gradually grown solid knowledge about the importance of sustainability in the past few years. The consumers' rising awareness of advocating sustainability in the fashion industry has dramatically damaged the business of the fast fashion industry because of the fact that most of the fashion retailers, especially small retailers, are indeed causing irreversible destruction to the environment. The trend of organic clothing (using sustainable fabrics) implies the researchers examine and analyze the consumers' purchasing behavior, like the extent of willingness to purchase environmental-friendly products, to develop new strategies that contribute to an enhanced profit. Additionally, another valuable research topic is what are consumers' perspectives towards the opinion that products from the fast fashion industry can be considered as knock-offs of products from highly brands as the lower price and quality.

7. Conclusion
The rapid development of the fast fashion industry will bring higher GDP to society and promote national economic growth. Facing the problems caused by the fast fashion marketing model, many brands have made strategies to adapt to the market to maintain sustainable
development. Every brand wants to find unique promotion methods to increase sales amount. They do it well, indeed. The different promotion ways give customers lots of choices to find a suitable style themselves. However, in applying these marketing strategies and profit-seeking means, people should further consider whether the living environment is deteriorating. Most people don’t realize they need environmental protection in peacetime because they don’t face the disease and death caused by pollution. In this article, we would like to call on all the fast-fashion clothing manufacturing industries to reduce pollution emissions as far as possible within their capabilities. Behind the beautiful fashion designs, if the price paid is the death of animals and human beings and the reduction of water resources, all the beauty will be fleeting.

Acknowledgments
All authors ranking regardless in no particular order.

References