**Sewing Machines and the Ethical Treatment of Garment Workers**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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**Abstract**

The unethical treatment of garment workers is a prevalent problem all over the world that affects over 40 million people. This unethical treatment is closely tied to the availability of up to date sewing technology in the factories they work in. This paper argues that the unethical treatment of garment workers is highly affected by the inability of sewing machinery technology to keep up with the increasing product demand from consumers. Examples throughout history are used to show how sewing machine technology has not been able to keep up with changes in the garment industry and how this affects the garment worker. The Actor Network Theory is used to analyze the relationships between consumers, garment factories, garment workers, and sewing machinery. Through these relationships, the unethical treatment of garment workers is discussed as well as how technological advancements in sewing machinery has affected their treatment. Findings from the research are that while technological advancements help garment workers in some aspects, the machinery does not effectively combat the effects high consumer demand has on the garment industry.

# Sewing Machines and the Ethical Treatment of Garment Workers

## Introduction

In 2016, 107 billion units of apparel were purchased worldwide, with the average American buying 53 items of clothing per year. The number of items of clothing purchased per year has since only increased (Common Objective, 2018). With so many articles of apparel being purchased and produced a year, it has become commonplace to go into a store, pick up a piece of clothing, and not know how the article was produced or who made it. This missing information on how items are produced is a problem because there are over 40 million garment workers laboring to produce them, many of whom work in poor conditions with little say in improving their work environment (Ross, 1997). Garment workers are often underpaid and are made to work on average 14-hour work days to produce the amount of clothing demanded by the industry (Common Objective, 2017). The recent increase in clothing production and sales is known as the fast fashion model because large amounts of clothing are quickly made and sold (Legere & Kang, 2020).

Sewing machines are the main tool garment workers use and the technological development of the sewing machine is closely tied to the ability of the garment worker to meet the demand for clothing. Similar situations have occurred throughout history where the clothing industry model changes but the technology being used has not changed. In this paper, Actor Network Theory (ANT) is applied to the relationships between the garment workers, garment industry, consumers, and sewing machines in order to investigate their impact on the ethical treatment of garment workers. Focusing on the relationships between the actors helps in analyzing the complex and unequal relationships between members (Cressman, 2009). The following question must be addressed in order to evaluate changes in the ethical treatment of

garment workers: how has consumer demand changed the sociotechnical relationships of sewing machinery and workers in the garment industry?

The question above will be addressed with the following thesis statement: Changes in demand from consumers in the garment industry leads to a rise in the unethical treatment of garment workers because sewing machinery technology does not advance fast enough to meet the new production demand. The thesis statement addresses each part of the research question and begins by inspecting changes made within the garment industry model based upon consumer demand. Changes within the garment industry are made depending on how willing the garment industry is to produce a supply of garments. When garment factories first started during the Industrial Revolution, the demand for articles of clothing was low because many were still being made at home and the garment workers were able to keep up with the demand with the help of sewing machines ("Story of the Sewing Machine," 1860). Today however, millions of articles of clothing are produced a day to meet the current demand from consumers. Another prevalent example is how with the start of the Covid-19 pandemic, demand rapidly increased for cloth face masks to prevent the spread of Covid-19. On top of the continuing demand for clothing, garment factories were needed to sew the face masks and needed to keep up with the demand. Historical case studies will be used to show how the garment industry model changes based upon what the consumers want. Additionally, current demands will be evaluated such as fast fashion which means changing styles every season and how the change in the garment industry model has affected the ethical treatment of garment workers. Fast fashion has increased with the help of online shopping and has resulted in changes in the garment industry like a steep increase in production demand.

*Examining the Unethical Treatment of Garment Workers*

Many garment workers are forced to work in sweatshops which are defined as places of production where workers are paid under the minimum wage and work for long hours in suboptimal conditions (New York Department of Labor, n.d.). Some examples of bad working conditions specific to garment factories relate closely to the sewing of the textiles. The textiles can lead to bad breathing conditions because particles from the clothing can get into the air. The clothing particles can then be breathed in and affect the workers' lungs. Additionally, multiple pieces of sewing machinery are run in the same room which can lead to loud conditions and affect the hearing of garment workers. Many pieces of sewing machinery also involve sharp components such as needles or cutting blades that can lead to a safety risk. Unfortunately, many garment workers are unable to protest these bad working conditions because they are unable to unionize or gain representation. A reason behind not being able to gain representation is the fear of retaliation from management and possible loss of job for speaking out (Ross, 1997). Additional stresses have been put on garment workers with Covid-19 as they have to deal with the pandemic along with their working conditions. In a recent discussion with garment workers in Myanmar and Cambodia, several union-member workers noted that their bosses used Covid-19 restrictions as an excuse to fire them, meaning managers would not have to deal with their grievances (Paton, 2020). Large numbers of workers have been laid off due to Covid-19 restrictions and the workers feel that union members have been targeted to be fired. This worry stems from earlier demands for better working conditions for employees. With Covid-19 restrictions, factories can use the excuse of them violating restrictions or having to minimize workers as a reason to fire them. With garment workers having little say on their working situations, it is important to look into how their conditions can be improved.

Knowing how garment workers are treated is important information for consumers to consider as consumers play a large role in how the garment industry is shaped. Consumers pay the garment industry and as a result, change what is produced and what production levels are required of the garment workers. If consumers are educated on the unethical treatment of the workers, they can make more informed decisions when spending their money, and in doing so, impact the way the garment industry treats garment workers by not funding the companies that use unethical labor. The unethical treatment of garment workers is also an important problem for garment companies because the companies contract out garment factories to make clothing and have the choice of which garment factories to give their business to. The companies have the option of using cheap, unethical labor to make a larger profit off of garments or to use their knowledge of how the garment workers are treated and give their business to factories with well treated workers. Within the garment industry, there are many decisions that can be made that are affected by the ethical treatment of garment workers.

**Sewing Machines and Garment Workers**

Before the sewing machine and garment factories, seamstresses were the main source for commercially available garments and were considered skilled workers in their craft. Seamstresses created garments from start to finish by hand and even a simple shirt could take multiple hours to sew. In response to the amount of work a garment took to make, inventors started creating sewing machines as a way to help seamstresses sew garments and seams faster. The first sewing machine was recorded in the Patent Office in February, 1842 (Urquhart, 1881). Soon after, many more patents were filed for sewing machines, each one more advanced than the previous. Early models were difficult for consumers to use and did not create reliable seams,

leading to a failure to gain much popularity. Subsequent designs worked to improve the ease of use and efficiency of the sewing machine. Eventually, a sewing machine model was well liked enough to be used for manufacturing purposes, the Singer & Co. model, which can be seen in Image 1 below (Urquhart, 1881). The Singer & Co. model was easier to use than earlier designs and was less likely to break on the user. The design led to many similar sewing machines being created that were also more user friendly. The early history of the sewing machine shows how important changes in the technology were for manufacturing processes. Earlier models were not well used because they did not provide meaningful support for the seamstress or garment worker, but instead slowed them down.

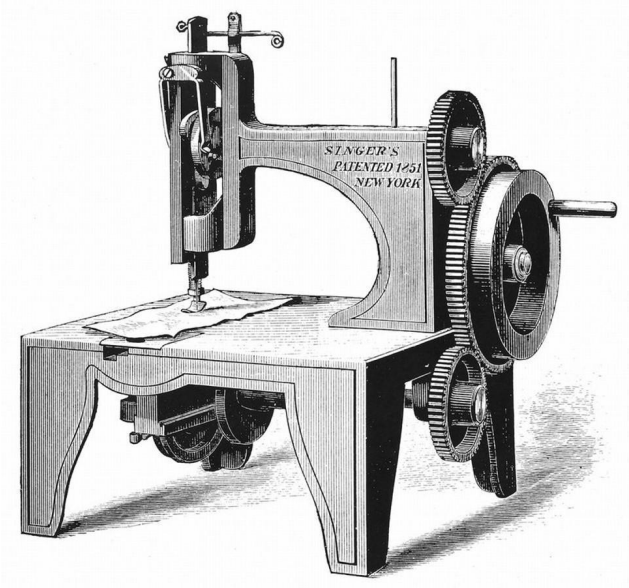


*Image 1. Early Singer & Co. sewing machine (The Mill Museum, 2019)*

The new sewing technology allowed unskilled laborers to also quickly learn how to sew, which led to the creation of garment factories. Companies could fill warehouses with sewing machines and workers to quickly start producing large amounts of garments. This was a big change from previous garment production methods in which specialized companies produced different garments. With the help of the sewing machine, the garment work force was changed

from a relatively small sector of seamstresses to anyone who could work a sewing machine ("Story of the Sewing Machine," 1860). The introduction of the sewing machine greatly influenced the garment industry in unexpected ways.

For the manufacturing of garments, the invention of the sewing machine greatly reduced the time needed to produce individual articles. The sewing machine was invented during a time where everything was hand sewn, leading to poor working conditions for those who used sewing as their profession. Hand sewing even a simple garment took hours and required good lighting. The sewing machine allowed people to ease their work and increase their income ("Story of the Sewing Machine," 1860). Once sewing machines were introduced, the demand for articles of clothing increased because they were produced faster and with cheaper labor costs. The faster production rate led to a greater supply, which forced prices to drop. The lower prices lead to an increased demand which increased the accessibility of purchasing garments. This once again put a larger strain on garment workers to meet the demand even with the help of sewing machines.

Sewing machines used in factories today are more advanced than the first Singer & Co. machine used in the 1800's. Firstly, the ones used in garment factories then were controlled by a hand crank and required more manual labor than current sewing machines which are electric and use foot pedals, similar to the gas pedal in a car, to control the speed and move the needle of the machine. The advancement from a hand crank to electric foot pedal benefited the user because they could use both hands to maneuver the garment and increase accuracy of sewing. Some other improvements have been made such as integrated lighting systems so that workers can have better lighting conditions and have less strain on their eyes. Stronger motors have also been put into the machines so that workers do not have to struggle to sew through multiple layers of

fabric. As seen in the image below, the modern day industrial sewing machine looks very different from the early designs used in the 1800's.


*Image 2. Industrial Juki Sewing Machine (Goldstar Tool, 2020)*

The sewing machine shown above is a Juki industrial sewing machine that is used in many sewing factories and is priced at ~$700 per unit (Goldstar Tool, 2020). This price does not vary much from previous models of similar sewing machines but for large factories, replacing all old machines with this newer model would still be a large expense. Despite advancements in sewing machines however, there is still a speed limit on how fast the machines can sew which can reduce production rates. Additionally, garment workers still have to be careful of the sharp needle when maneuvering garments. However, even the advancements that have been made in

industrial sewing machines can not address the problems associated with sweatshops such as having to use the machine for over 10 hours a day and working in cramped conditions.

**Case Studies on The Effects Sewing Machinery has on Garment Industries**

While there are many influences on the ethical treatment of garment workers, one of the main contributors is the lack of changes in sewing machine technology to keep up with the changing garment industry models. The garment industry tries to meet consumer demand in order to sell as many articles of clothing as possible. This is detrimental to the treatment of garment workers because their quota changes based on consumer demand, which has been only increasing (Gordon, 2012). In order to combat high consumer demand, the garment industry could sell smaller amounts of clothing at higher prices to still make a profit while treating garment workers better. Many companies do not do so, however, as changing production levels would mean changing production and marketing practices, which companies see as detrimental (Hur, 2020).

Instead of changing production methods, an alternative would be to increase the efficiency of the sewing machinery. Factories that employ better technologies often have better treatment of garment workers because the sewing machinery allows the workers to work in a safer environment while producing more in the same time (Ross, 1997). In other words,the machinery allows for the levels of production to be kept the same while allowing the garment workers an easier time meeting the quotas. Further discussion will follow using specific examples of how changes within the garment industry and the inability of the sewing machine to keep up has changed the ethical treatment of garment workers.

*The Industrial Revolution and How Sewing Machines Gained Popularity*

During the Industrial Revolution, sewing machines increased greatly in popularity. The previous garment industry model was to have individual garment workers complete a garment from start to finish with hand sewing. There was, however, an increasing demand for garments so the garment industry model changed. Workers were made to quickly sew garments on the newly invented sewing machine. Sewing houses were no longer restricted to finding those who were trained in sewing and constructing garments, but could instead quickly train people on the sewing machine to start producing clothing ("Sweatshops 1880-1940", 2018). In this case, the sewing machine technology did not change to keep up with the demand but rather skilled seamstress workers were replaced with unspecialized workers who were forced to work longer hours in order to compensate for the lack of experience sewing garments. Once sewing machines were introduced into a factory setting, the use of the machine spread across the world and affected the garment industries in other countries. One such country affected by sewing machines was Japan, whose effects can be most notably seen in the garment industry after the Cold War.

*Garment Production in Japan After the Cold War*

During the Cold War, the Japanese garment industry was affected by western culture and styles (Finnane, 2016). Traditional Japanese garments required delicate needlework for embroidery or to create the correct shape of the garment. With western styles of clothing however, a different type of needlework was needed. Western style clothing used buttonholes more often and seams that were much easier to create with the use of a sewing machine (Gordon, 2012). With the changes in consumer demand for more western styles of clothing, the sewing machine was broadly introduced as a way to provide supply for the demand. The sewing

machine technology was seen as a way to provide help to seamstresses to achieve the necessary skills to create the garments. Once introduced, the sewing machine was portrayed to Japanese housewives as a way to stay home and make a profit. Theoretically, housewives could stay home and sell clothing to their neighbors because the speed of the sewing machine allowed them to finish household sewing, like mending, faster. However, while the idea that women could use the sewing machine to make a profit at home was pushed, another, conflicting idea was being pushed in Japan. The new idea suggested that in order to make a profit, the garment worker would need to spend all hours of the day working at the machine in a factory (Finnane, 2016). This change in production ideas affected the garment workers in unforeseen ways. Instead of providing a way to work for less time, the sewing machine was used as a way to push for longer work hours. Similar ideas are discussed in the book "More Work for Mother" where the introduction of technology into households did not really lessen the amount of work being done but rather just redefined what the work was (McConnell, 2000). While the new pieces of technology helped those expected to complete tasks, the technology also had the side effect of making the work seem minimal and increased expectations that more work should be completed in the same amount of time because the work was less strenuous. The idea of working for longer hours followed the garment production model when sewing factories began being set up in Japan. Many expected the sewing machine to bring about less work, but the work standards in Japan led to the unexpected outcome of expecting more production from the workers.

*The Effects of Fast Fashion on Garment Production*

Both of the historical case studies described above have contributed to the current garment production model of fast fashion. The cases of the sewing machine in the Industrial

Revolution and post Cold War Japan both show how important the sewing machine is to the garment worker. The case study of Japan's garment industry shows similarities to the current model of fast fashion where workers are expected to work more hours to meet production demand and make a profit . Fast fashion is where styles of clothing change rapidly and large amounts of clothing are produced each "season" to be sold to consumers (Lundblad & Davies, 2016). The consumer demand for different styles of clothing to match what is currently trending has led to a high production rate of garments. The garment workers thereby need to keep up with the demand for the garments of clothing. The higher production rate of garments in fast fashion is different from past garment industry models because the styles of clothing being produced changes so rapidly. Garment companies are focused on producing disposable items of clothing instead of lasting items because the companies want consumers to be constantly buying clothing instead of keeping items for a long time (Legere & Kang, 2020). The increase in clothing production has become a problem because the working conditions for the garment workers have not considerably changed despite the increased profits and desired production. The garment workers still use the same sewing machinery to sew clothing that they used before fast fashion as they do now. There have however been advancements made in other garment production machinery that has increased the speed of clothing production. While no new major advancements have been made with sewing machines, advancements have been made with the preparation of fabric for sewing. One such advancement is the mechanization of textile cutting. Previously, workers needed to manually steer a cutting blade through the textile, following a pattern. Recent advancements have been made where small scale batches of clothes can be cut with a laser cutter. Additionally, machines have been built where the machine holds the cutting blade and a computer moves the blade along on tracks to create faster and more precise cuts.

This reduction of work for garment workers helps with the working conditions because they no longer have to work closely with some of the dangerous instruments.

Advancements made in sewing machinery often not only help with the speed of production but also with the safety of the production. With the new advancements described above, the garment workers have a safer work environment and are put at less risk. Currently, this increased speed is not used to improve working conditions for the workers, but instead used as an excuse to require higher production output. Even though machinery is advancing in places, demand from consumers still drives the production demand much higher than the workers can keep up with.

In all of the examples provided above, a driving force behind changes within the garment industry has been consumer demand. Consumer demand leads to garment companies increasing their production rates and making their workers work more. Despite new sewing machinery being introduced like in Japan or during the Industrial Revolution, garment workers still suffered from the sudden increase in demand from consumers. The sewing machines helped the garment workers meet demand but not for long as production demands changed. Sewing machine advancements have not been made fast enough to keep up with the production demand and are unable to support the worker through the increase in work.

**Science, Technology, and Society Analysis**

The Actor Network Theory (ANT) will be used to help analyze the relationships between each part of the garment industry. ANT is particularly useful in this research as it treats human and non-human actors equally in their contributions to a network (Cressman, 2009). An ANT view of actors will allow the research to not only focus on the garment workers and consumers,

but also the garment industry model and sewing machinery to see how they each contribute to the treatment of garment workers. First, each player in the network will be discussed along with their contribution to the network and then some criticisms of ANT will be discussed. It is important to think about the criticisms of ANT because the garment workers are in a relationship with many players who have critical impacts on their working conditions. Garment industry companies set the production level for garment workers and work to meet consumer demand. In doing so, the ethical treatment of garment workers can be neglected in favor of appeasing the consumers who provide money to the industry. The garment industry model plays a role in paying for research and development of sewing machinery. They decide if money should be spent creating better machinery or if the money is better spent elsewhere. This is important because if they decide to spend money on sewing machinery, then this will make the machinery work better and increase the ethical treatment of garment workers because they do not have to work in such difficult conditions with the machinery.

Garment workers produce articles of clothing based upon quotas provided by the garment industry. Many garment workers do not have a say in this unless they are unionized. Being in a union allows the garment workers to discuss their working conditions and be a part of a group when confronting higher ups within the company. Unfortunately, many garment workers are not unionized and are unable to make their needs known collectively, reducing their power (U.S Department of Labor, 1997). In this way, ANT shows one of its own flaws in treating every actor equally. Compared to the rest of the actors, garment workers have less of a say in what happens in their relationships. This allows the garment industry to treat them unethically and leads to their worsening conditions. The garment workers are highly impacted by any changes the garment industry makes as many of them are considered “unskilled” laborers by their employers and can

be replaced quickly if fired (Paton, 2020). This means that much of the improvement for their working conditions is either from improvement in sewing machinery or from direct changes made in the garment industry.

Consumers interact with the garment industry by buying what they produce and creating a demand for certain products. Individual actions are often driven by societal needs and the want to fit in, which often leads to a disregard for how consumer demand impacts garment workers. Looking at current trends, the demand for garments has increased in recent years, fueled by social media and the garment industry itself pushing to sell more clothing (Legere & Kang, 2020). The increase in demand puts pressure on garment workers to produce more clothing as the garment industry focuses more on catering to the wants of the consumers than the ethical treatment of the workers. The garment workers are unable to keep up with the increase in demand, so they are expected to work for limited pay and unpaid overtime to meet the demand. On the opposite end, however, there has been a recent push for slow fashion and conscious buying of clothing. Slow fashion considers not only the environmental impact of clothing manufacturing, but also the ethical treatment of the garment workers (Lundblad & Davies, 2016). Slow fashion emphasizes limiting purchases and researching companies and their actions to keep consumers informed. With slow fashion, consumers can have the opposite effect on the garment industry than fast fashion and with their choice of purchases make garment companies more accountable for their actions.

Sewing machinery fits into the relationships above by being highly influenced by the garment industry and highly influential for the garment workers. The relationship between the garment industry and sewing machinery will first be investigated. New development of sewing machinery is funded by the garment industry based upon if the garment industry sees a need for

technological advancements such as if production needs to be faster or safer. The garment industry and factories, however, have the option between funding and purchasing new sewing machinery to help the garment workers and reach production goals or to make the garment workers work for longer hours and achieve the same effect. Another part of the relationship is that sewing machinery advancements are made much slower than changes made within the garment industry and with consumer demand. This creates a constant lag on the part of sewing machinery to keep up with demand from consumers so the slack has to be picked up by the garment workers. For the relationship between sewing machinery and the garment workers, sewing machinery efficiency highly impacts the work life of garment workers while the garment workers often do not have a say in what sewing machinery the factory provides. The garment workers not having a voice in what sewing machinery they work with has an impact on the ability of sewing machinery to reduce the unethical treatment of garment workers.

Changes made in any of the groups discussed above will have effects on all of the other actors because they are linked together in a network. Consumers, however, have a larger impact on the garment industry than garment worker complaints as consumers feed the industry with money. With consumer demand having such a large impact on the industry, other parts of the network need to change to accommodate consumer demand. Often, the compromises come in the form of the garment workers working for longer periods of time or working in worsening work conditions. Sewing machinery can absorb some of the impacts consumer demand has on garment workers by making work less tedious and demanding. However, sewing machinery has not been able to advance as quickly as consumer demand has increased so much of the impacts are felt by the garment workers.

**Counter Arguments**

In concluding the argument that technological advancements in sewing machinery is directly tied to the improved ethical treatment of garment workers, there will be criticisms of the argument that will be addressed. The first main counter argument is that the technological evolution of sewing machines does not have a large impact on the ethical treatment of garment workers as the garment workers will have trouble obtaining the new equipment. Even if there were advancements made in sewing machinery fast enough to keep up with the demands of consumers, there would be no guarantee that factories would actually purchase the machinery for the workers. As discussed in Winner's article, "Do Artifacts Have Politics?" pieces of technology can be made in order to solve problems within a community, which in this case, would be advancements in sewing machinery to help reduce the unethical treatment of garment workers. Winner, however, also discusses that the effectiveness of technological advancements in addressing problems are influenced by what group uses them and in what social system the technology is used in (Winner, 1980). Advancements in sewing machines can be made, but the amount of impact they have on the garment workers will be decided by what social system they are used in, such as if the garment factories' main priorities are the welfare of the workers or keeping a large profit. On one hand, the garment factories might be unwilling to purchase the new equipment because it is an initial large investment. While on the other hand, garment factories are likely to buy the new machinery if they are focused on the well being of the garment workers. Sewing machines are the pieces of technology the garment workers use every day, so any improvements in the sewing technology greatly improves the quality of not only the working conditions, but also the production rate. The workers will have an easier time completing the same tasks and meeting consumer demand. Additionally, more social movements are happening

where there is a push for more ethical treatment of garment workers and the investigation of sweatshops. Garment factories are more likely to purchase the new machinery for their employees if it will keep production rates up while reducing the possibility of closure from an unethical treatment of worker investigation.

Another counter argument is that the problem of the unethical treatment of garment workers can be addressed fully by only changing factory management without the need for introducing technological advancements in sewing machinery. One aspect of the unethical treatment of garment workers is the high demand for products and the factory management pushing the workers to meet the demand. Changing factory management will not change the consumer demand for large amounts of products so the production amount needs to be addressed and that cannot change with just a management change. Factories are also pressured to produce a certain amount of product from the clothing company that hired them so there are more factors that have to change than factory management.

Some could say that clothing companies can focus on producing less clothing and charging a higher price for the quality. While this would reduce the pressure of demand on the garment workers, many companies are unlikely to change their production practices if the changes would lose the audiences already buying from the company. Increasing the prices of garments might make people search for cheaper clothing at other brands and make the company lose money. Factory management could also hire more workers instead of purchasing new sewing equipment to reduce the workload of current employees. While more employees would take some of the workload off of current employees, it is still not an optimal solution because there is no guarantee that the new workers will make the treatment of the current workers any better. The garment workers either need help in some way to produce garments easier and faster

or multiple parts of the relationship need to change. If changes are made within factory management and consumer demand then changes with sewing machinery would not have to be made.

**Conclusion**

Consumer demand for articles of clothing has been quickly increasing and impacting production demand and garment workers' ability to meet the demand. Sewing machinery has not advanced enough to critically help garment workers bridge the gap between an ethical workplace and high production rates to meet demand. The unethical treatment of garment workers is a pervasive and prevalent problem and even with the large amount of people working as garment workers, many do not have a say in their working conditions and are dependent on the conditions of the garment factories for ethical treatment. The garment industry is fast paced and often requires more supply from the garment factories than they can provide, leading to extra stresses put on the garment workers. Technological advancements made with sewing machinery can lead to a more ethical treatment of garment workers because some of the load of meeting consumer demand is taken by more efficient machines.

The ethical treatment of garment workers is affected by many different relationships between the garment industry, consumers, garment workers, and sewing machines. Each of these relationships in turn affect the price and speed of production of garments. The current garment industry model of fast fashion focuses on reducing the price of garments for consumers and increasing profit for the company and often neglects focusing on fair compensation for the garment workers labor. To help garment workers, fundamental changes need to take place within the garment industry on multiple levels. Restructuring the industry to focus more on the rights of

the garment workers might cause the rise of garment prices for consumers while compensating garment workers more. The concept behind the restructuring would be that consumers are educated about the production practices of the clothing companies and understand that the higher prices are helping garment workers have a more ethical workplace. The garment industry has a certain amount of money going in and out of the system and it is important that everyone in the relationship, garment workers, consumers, and garment companies, are taken into account when decisions are being made on the structure of the garment industry. By analyzing each of these relationships, it becomes clear that more advanced sewing machinery would help the garment workers with their work. Sewing machinery technology, however, is not changing fast enough to effectively deal alone with the effects increases in production demand from consumers have on the ethical treatment of garment workers.

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