ABSTRACT

Title of Thesis: CHALLENGING THE FAST FABRIC INDUSTRY:
A ZERO FABRIC WASTE CAMPUS

Margot Bloch, Bachelor of Arts, 2023
Mia Chang, Bachelor of Science, 2023
Alexis Esuke, Bachelor of Science, 2023
Kira Fallen, Bachelor of Science, 2023
Kayleigh Gallagher, Bachelor of Arts, 2023
Mina Senthil, Bachelor of Science, 2023
Stephanie Zheng, Bachelor of Science, 2023

Thesis Directed By: Associate Professor of Marketing,
Mary Beth Furst Ed.D., M.B.A.
Robert H. Smith School of Business

The fast fashion industry creates environmental, humanitarian, and economic problems by selling inexpensive, poor-quality products, causing pollution during and after manufacturing, and encouraging throw-away culture. This research aimed to understand industry forces and consumer behavior while developing a process for diverting textile waste from landfills. Data gathered through surveys revealed cost as the leading factor among college students in clothing purchases. Additionally, students were deterred from sustainable habits such as upcycling and mending their own clothes due to a lack of time and skill. However, they were willing to make changes to behaviors as long as it was convenient. We also tested the feasibility of establishing a zero-fabric waste campus by collecting textiles and sorting them for redistribution for upcycling, donation, and recycling. The goal was to create a comprehensive blueprint for residential communities like universities to recreate a system as convenient as curbside recycling. More than 700 pounds of textiles were collected and diverted from landfills by donating them back to community organizations and giving them a second chance. As a result, we provided a channel for college

students to act on their knowledge of fast-fashion clothing. This zero-fabric waste system has the potential to be highly successful given the attitudes of students determined in our research, who will drive change as a more environmentally conscientious generation.

Keywords: fast fashion, textiles, clothing, waste, pollution, recycling, upcycling, sustainability, consumer behavior, survey

CHALLENGING THE FAST FASHION INDUSTRY:
A ZERO FABRIC WASTE CAMPUS

by

Team RECYCLOTH
Margot Bloch, Mia Chang, Alexis Esuke, Kira Fallen,
Kayleigh Gallagher, Mina Senthil, & Stephanie Zheng

Thesis submitted to the Faculty of the Gemstone Honors Program of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the citation of
Gemstone Honors College.
2023

Advisory Committee:

Mary Beth Furst, Ed.D., M.B.A., Associate Clinical Professor at the Robert H. Smith School
of Business, Chair
Nima Farschi, M.B.A., Lecturer, Department of Management & Organization at the Robert
H. Smith School of Business
Michael Levine, Chief Sustainability Officer at Under Armour, Inc.
Claire Runquist, Environmental Sustainability Coordinator at UMBC
Jie Zhang, Ph.D, Professor of Marketing at the Robert H. Smith School of Business

Acknowledgments

Table of Contents

List of Tables

List of Figures

Challenging the Fast Fashion Industry: A Zero Fabric Waste Campus

The industrial revolution and the post-war economic boom from 1948 to the 1970s dramatically changed the fashion industry. As new technologies transformed manufacturing, along with the rise of the middle class and unprecedented numbers of working women, the public had more disposable income thus creating a greater demand for fashion. The fashion industry shifted from only serving the affluent with luxury fashion to offering commodity goods appealing to the emerging middle class as well (Hoskins, 2014). In the last 30 years, fashion has grown from a mostly domestic $500 billion trade to a $2.4 trillion international market and employing more than 300 million people globally (Thomas, 2019; Ellen MacArthur Foundation, 2017). With the growing working population, increasing wages, and decreasing time to sew clothes at home, the fashion industry has surged in popularity and power, making fast fashion companies an increasingly significant segment of the global economy.

The definition of **fast fashion** (see Appendix A for glossary) retailers varies, and Caro and Martinez-de-Albeniz (2015) have identified three elements that characterize a fast fashion business model: quick response production, frequent assortment changes, and fashionable designs at affordable prices. Quick response production emphasizes the speed at which brands get new designs to store shelves, especially by focusing on logistical flexibility. Rapid production also allows for frequent assortment changes, encouraging consumers to constantly buy new items showing up in stores. Marketing strategies have evolved as well, effectively attracting customers and adjusting to their tastes, thus driving new purchases. The ultimate value proposition of a fast fashion company is trendy and up-to-date clothing at low prices (Caro & Martínez-de-Albéniz, 2015). Fast fashion is also used to describe fashion designs that move rapidly from the catwalk to the retailer. Fast fashion companies thrive on high-speed cycles through rapid prototyping, small batches with large variety, and efficient transportation and delivery (Joy et al., 2012). Previously, the turnaround from catwalk to consumer took approximately six months; now, brands like H&M have turnaround rates of two months, and companies like Zara are able to compress the process to just 13 days (Joy et al., 2012).

Given the expeditious processes that have developed over the past quarter century in response to greater demand from corporations and consumers alike, the fast fashion industry has contributed to various environmental and humanitarian issues around the world. Corporate interest in expanding business to a larger populus has resulted in rapid manufacturing operations that may

be efficient in producing up-to-date clothing to meet consumer demand, but has negatively affected our land, water, and people. The following sections will clarify terminology used in our paper to offer consistent definitions for environmental, humanitarian, and sustainability terms that may have various explanations in the popular press.

Environmental Issues

Fast fashion exacerbates environmental issues including increased carbon emissions and energy use, water pollution, and waste in landfills. The fashion industry contributes 10% of all global carbon emissions and that is projected to increase to 50% of all global carbon emissions by 2030 (World Bank, 2019). In 2018 alone, nearly 2.1 billion metric tons of greenhouse gasses were produced by the industry. The majority of fast-fashion clothing is produced by using unsustainable synthetic, petroleum-based fabric resulting in increased emissions. According to Claudio (2007), both synthetic fabrics, such as polyester, and natural fabrics, such as cotton, have an adverse and long standing effect on the surrounding and larger environment. Polyester is made from petroleum and requires large amounts of energy, crude oil, and other chemicals to produce. Limited and costly textile recycling methods contribute to almost "60% of all clothing produced" being disposed of and ending in a landfill or incineration within only a year of production ("The Price of Fast Fashion," 2018). Clothes disposed of via incineration result in high volumes of greenhouse gasses being released. Incinerating clothes releases 2,998 pounds of carbon dioxide per megawatt hour of electricity generated. Both burning coal and natural gas release less carbon dioxide than incinerating clothes; burning coal releases 2,249 pounds of carbon dioxide per megawatt hour and natural gas releases 1,135 pounds per megawatt hour (Segran, 2019).

Dyes and process chemicals used during production to improve color fastening and add finishes have greatly contributed to water pollution; they are released as **effluent**, or wastewater, into water sources when clothes are washed during production and consumption stages (Oliveira et al., 2007). In particular, **azo synthetic dyes** are the most harmful because they are carcinogenic and mutagenic (Kunz et al., 2002). For example, quinoline is a dye found in 100% polyester clothing. This class of chemicals is classified as skin/eye irritants and toxic to aquatic life (Luongo et al., 2014). Furthermore, his type of pollution not only endangers aquatic life but is a possible human carcinogen and could contaminate drinking water as well. (Evans et al., 2019). Water pollution also occurs post-production. A 2017 study found that plastic microfibers shed from

polyester clothing averaged 0.985 microfibers per liter along the length of the Hudson River (Miller et al., 2017). This study also concluded that 34.4% of the Hudson River's watershed drainage area contributes an average 300 million anthropogenic microfibers into the Atlantic Ocean per day (Miller et al., 2017). This waste affects the local ecosystem and accumulates in the food chain, potentially affecting humans.

Fast fashion production and consumption increases waste in landfills, posing another challenge. About 10% of clothing that people decide to discard are resold or reused; the other 90% ends up in landfills (Thorisdottir & Johannsdottir, 2019; EPA, 2017). To put it into context, Americans discarded 73% of their closets which were then sent to the landfill or incinerated (Ellen MacArthur Foundation, 2017).

Humanitarian Issues

In some cases, fast fashion outsources labor and utilizes **contract manufacturing** for textile and clothing production to minimize production costs. This creates both a number of humanitarian complications and various loopholes that distance fast fashion brands from their ethical responsibilities. Companies enter into an arrangement with manufacturers, often in foreign countries, to produce components that the fast fashion company will use in manufacturing garments (Hoskins, 2014). The manufacturers are provided specifications by fashion brands who can then buy the finished products. This allows brands to be disconnected from the manufacturing company and therefore avoid responsibility for any humanitarian issues that occur during manufacturing.

In some cases, manufacturing via outsourcing in foreign countries can be used to avoid labor rights violations, and can lead to the use of sweatshops. The U.S. Department of Labor defines a **sweatshop** as "an employer that violates more than one federal or state labor law governing minimum wage and overtime, child labor, industrial homework, occupational safety and health, workers compensation or industry regulations" (U. S. Government Accountability Office, 1994, p. 1). More generally, sweatshops are known for treating employees inhumanely and violating their basic human rights such as the right to a fair wage and the right to safe working conditions. Some fashion companies source their production abroad to countries with far fewer labor laws and restrictions. Primark, a European brand, is notorious for its inhumane working conditions. Laborers often work 80-hour weeks for around 7 cents per hour, and the company saw

the death of 100 workers in a two-month period (Hoskins, 2014). Several other brands have been exposed for also using exploited labor: H&M, Nike, Reebok, Adidas, and Ralph Lauren are some examples among the relatively high-profile brands exposed since 2001 (Hoskins, 2014).

In addition to poorly paid, high-stress work, laborers are continuously exposed to dangerous working conditions during clothing production. An example is the Rana Plaza accident, which occurred in Bangladesh, one of the major locations for garment and textile production. The Rana Plaza retail and apparel manufacturing complex, which contained five garment factories, collapsed in 2013, injuring 2,500 and killing over 1,100 people, making it the "deadliest garment industry accident in modern history" (Thomas, 2018). Bangladesh has long attracted brands as being among the cheapest places to produce clothes, with $30 billion worth of ready made garments produced there (Thomas, 2018). 83 percent of Bangladesh's foreign currency comes from the garment sector, and more than 4.4 million people work in its 3,000 factories, where the minimum wage is currently 32 cents an hour (Thomas, 2018). Working conditions in Bangladesh apparel factories are dangerous, with more than 500 Bangladeshi garment workers dying in factory fires between 2006 and 2012 (Thomas, 2018).

Fire incidents and building collapses are alarmingly common in clothing manufacturing plants where workers are also exposed to unsafe working conditions with high rates of work-related accidents, diseases, and deaths. There are an estimated 1.4 million work-place related injuries in the fashion industry each year (*Death, Injury and Health in the Fashion Industry*, 2018).

Corporations systematically seek out the most profitable locations for production through **global scanning** processes. According to Thomas (2019), in 1991, 56.2% of all clothes purchased in the United States were American-made but by 2012, it was down to 2.5%. According to the Bureau of Labor Statistics, between 1990 and 2019, the US apparel and textiles industry lost 1.35 million jobs (K. Harris, 2020). More than three-fourths of the sector's labor force was offshored to Latin America, Asia, and Eastern Europe, where labor is much cheaper due to a lack of protections against low wages (Thomas, 2019). By outsourcing production and utilizing contract manufacturing in selective global locations, fast fashion companies are able to reduce the cost of labor, and thus provide lower prices for end consumers (Hoskins, 2014). Current American government policies and laws mitigate the effects of fast fashion such as fair trade laws give the illusion that US brands operate with strict standards for labor conditions and follow all regulations.

However, brands can still choose to manufacture overseas where cheap labor and humanitarian issues are seen more frequently.

Sustainability

In this era, **sustainability** is more than just going green. The definition of sustainability varies in the apparel industry and among its consumers. Sustainability is a multidimensional concept (Garcia-Torres et. al., 2017). Most companies and the United Nations' Sustainable Development Goals use **Elkington's triple bottom line framework** to define the boundaries of what sustainability means. The framework aims to encourage organizations to measure their performance based on three key areas – commonly referred to as the 3Ps – profit, people, and planet (Joy et al., 2012). Sustainability in fashion can also be defined more simply as "efforts to minimize the fashion industry's adverse environmental and social impacts" (Peleg Mizrachi & Tal, 2022). Across varying definitions, there is a pattern: sustainability is about making the best use of the resources available and practicing mindful consumption of goods and services so that all basic needs and quality of life are met without jeopardizing the needs of future generations (Gordon et al., 2011).

<div align="center">Literature Review</div>

The literature review summarizes current fast fashion business models and practices, presents case studies about the fast fashion companies *Zara* and *Shein*, and examines current sustainability and recycling practices in the fast fashion industry. Lastly, it identifies and explores consumer behavior that supports fast fashion.

Current Fast Fashion Business Model and Practices

Overall, the traditional fashion strategy, which dominated the industry before the rise of fast fashion, focused on producing standardized clothing at the lowest possible cost. In the traditional model, brands release a few seasons per year, in which large numbers of new items are introduced, and subsequently stay in stores for a longer period of time. As a result of these longer seasons, sales forecasts must be made well in advance, leading to a higher level of demand uncertainty, which can result in overproduction and resource waste (Backs et al., 2020).

On the other hand, in the very definition, fast fashion business models emphasize quick response time and maximizing profit by appealing to customer wants and increasing sales (Backs et al., 2020). Quick response production allows brands to get new designs to store shelves as

rapidly as possible, responding to fresh demand trends generated from the catwalks and capturing more consumer value. The flexibility in logistics also allows fast fashion brands to work at the item level, producing items in smaller quantities and only stocking these items for a few weeks, rather than depending on collections to release large sets of clothing twice a year (Backs et al., 2020). Shorter seasons allow for more accurate demand forecasts, and this provides the freedom to introduce new products continuously, targeting consumers who are fashion conscious and seeking variety. The limited production of each good creates a high turnover of items available in stores and a sense of scarcity and exclusivity, encouraging customers to buy clothing items on the spot, rather than waiting for end-of-season markdowns (Backs et al., 2020). Frequent assortment changes also balance the use of resources such as designers, factories, and distribution centers over time (Caro & Martínez-de-Albéniz, 2015). With brands responding rapidly to new trends and production limits, clothes from fast fashion retailers are perceived as innovative and fashionable.

Low pricing is also a significant part of the value proposition for fast fashion brands, especially compared to traditional fashion companies. For example, a quick internet search will find a plain white H&M t-shirt for $2.99 (H&M, n.d.). At traditional fashion retailers like Macy's, a plain white cotton Champion t-shirt costs $20.00 (*Womens Cropped Cardigan Sweaters - Macy's*, n.d.). Even a simple pricing difference in "basics," a staple in almost every closet whether a consumer considers themselves fashionable or not, can make a great difference in purchasing patterns. A trendier example may be the price of a cropped cardigan sweater, ranging from $7.99-49.99 at Forever 21 (Forever 21, n.d.) and costing anywhere from $25.99-56.99 at Macy's (Macy's, n.d.). The fast fashion business model provides an endless supply of stylish and affordable clothing for consumers who want to stay fashionable (Caro & Martínez-de-Albéniz, 2015).

Case Study: Zara

Crofton and Dopico's (2007) case study on the brand Zara and its parent company Inditex is useful to consider because Zara is often identified as a pioneer of the fast fashion business model. Originating in Spain in 1975, the brand has revolutionized the fashion industry. With sales of $21.9 billion as of July 2020 and nearly 3,000 stores in 96 countries, Inditex is one of the largest fashion companies in the world (Crofton & Dopico, 2007).

Inditex emphasizes shortening lead time to increase flexibility in logistics and its response to ever-changing consumer demand. This is largely accomplished by vertically integrating stages

of production within the company. For example, rather than outsourcing production entirely to low-wage subcontractors in other countries, Inditex produces large proportions of its products in its own factories, only outsourcing certain stages that add less value. Distribution and retail sales are completely performed by Inditex subsidiaries. The standard design-to-retail cycle in the traditional industry is five to six months, whereas Inditex can get new styles to shelves in five weeks (Crofton & Dopico, 2007). This speed and flexibility allow Inditex and Zara to adjust to constantly fluctuating fashion trends. The rapid reaction to customer demand also enables Zara to cut some costs; for example, faster turnover rates eliminate the need for large stockrooms within retail stores. By constantly bringing new, trendy styles to stores and updating them frequently, Zara creates scarcity value around their clothing, leading consumers to visit stores often and buying out inventory immediately out of concern that limited stock will disappear if they wait for end-of-season markdowns (Crofton & Dopico, 2007).

The Business Model

The fashion industry has been accused of lacking responsibility in sustainability-related issues. The industry relies on a **linear business model** where environmental impacts are externalized and not properly accounted for within the model (Caro & Martínez-de-Albéniz, 2015). To reiterate, the essence of "fast" fashion is high production and consumption levels and fast turnaround times, all of which magnify waste and negative externalities along the value chain. During manufacturing, the pressure for fast inventory turnover results in a high production volume of many different clothing items, leading to the consumption of unsustainable raw materials and use of toxins and dyes. At the other end of the business model, high consumption levels, combined with short product life cycles and marketing tactics to keep consumers constantly buying new items, results in a major disposal problem (Caro & Martínez-de-Albéniz, 2015). Waste is produced during all stages: manufacturing, distribution, retail, consumer, and product end-of-life processes (Thorisdottir & Johannsdottir, 2019). In 2018 in the US alone, almost 13 million tons of clothing waste was generated (Thorisdottir & Johannsdottir, 2019; EPA, 2017).

The industry's marketing strategies encourage the disposal of relatively new garments; fashion trends change quickly, which often results in consumers discarding relatively new garments to make room for more up-to-date clothing. This problem goes hand-in-hand with fast fashion's emphasis on rapid inventory turnover. Brands are constantly stocking their shelves with

new, low-priced items that sell out quickly, incentivizing consumers to perpetually buy more and more to stay on top of trends (Caro & Martínez-de-Albéniz, 2015). This low-cost clothing closely mimics current luxury fashion trends, acting as the bridge between high fashion and the everyday consumer. Fast fashion's targeted consumer segments largely consist of young adults because they are equipped with both the desire for trendy apparel and significant disposable income (Joy et al., 2012). By offering of-the-moment designs and fulfilling consumers' want for immediate gratification, the fast fashion industry pulls young consumers into an endless cycle and encourages a high volume of consumption (Joy et al., 2012).

Fast fashion products also lack durability. Fast fashion companies openly proffer that after about ten washes, an item will no longer be expected to retain its original value because of poor quality fabric, cheap materials, and manufacturing processes that prioritize speed (Joy, et al., 2012). Though the industry could incorporate higher quality materials and more durable stitching, it purposely incorporates throw-away culture into its products. By designing products with a limited lifespan and built-in obsolescence, companies save costs on higher quality materials and production processes while reinforcing consumer behavior of discarding old or unwanted items, and fulfill their desire to constantly purchase new clothing (F. Harris et al., 2016). Simultaneously, it lowers the viability of the second-hand market by limiting the lifespan of each item. Clothes quickly wear out and are discarded rather than sent to second-hand retailers or donated to charity.

Case Study: Shein

Shein (pronounced "She In") is a Chinese fast-fashion retailer known for selling inexpensive clothes for women, men, and children along with accessories and lifestyle items. In addition to being the most downloaded shopping app and the largest fashion retailer in the United States and valued at $100 billion in April 2022 which made it worth more than H&M and Zara combined (Yip, 2022). Despite its current success, the company had a humble beginning.

According to Heldelmann (2022), Yangtian Xu, who also goes by Chris Xu, experimented with different business ventures before creating a brand named SheInside that sold wedding dresses to American and British consumers. After many trials and errors with the operation and funding from investors, Xu expanded products beyond wedding dresses in 2012 and rebranded SheInside to Shein in 2015. While growing, Shein experienced a data breach of 6.42 million accounts in September 2018 and was banned in India along with 68 other Chinese apps in June 2020. Despite these events, the company remained undeterred and continued to grow its footprint

in over 200 countries and generate $3 billion in annual revenue. Shein's success became especially prominent during the pandemic when brick-and-mortar retailers suffered losses and store closures while it took advantage of the shift to online shopping (Hendelmann, 2022).

Shein's success can be attributed to three mechanisms in its business model: algorithmic analytics, quick churns, and marketing tactics. Shein uses data from Google Trends, social media hashtags, scraping competitors' websites, and other sources to predict what is currently trending (Hendelmann, 2022). Using these trends, hundreds of in-house fashion designers, and Shein's required supply-chain management software in each factory, the suppliers are able to manufacture in quasi real-time (Hanbury, 2021; Hendelmann, 2022). Hanbury (2021) adds that Shein uses as few as 10 days to complete its design and production process. Not only is Shein able to monitor the manufacturing process with the software, the suppliers can also check current sales, stock levels, and even bid on manufacturing a new set of clothing (Hanbury, 2021; Hendelmann, 2022). Shein adds an average of 2,800 new styles to its website each week producing approximately 100 units for each style and determining future production based on the individual style's popularity (Hanbury, 2021). In comparison, its UK-based ultra-fast fashion rival Boohoo adds around 500 styles a week and has to order 300 - 500 items per style due to inability to place smaller bids (Hanbury, 2021; Hendelmann, 2022). The differences are even starker compared to its brick-and-mortar competitors. In a twelve-month period, the Gap listed roughly 12,000 different items on its website, whereas Shein listed 1.3 million (Vara, 2022).

In addition to the technology and analytics that enable speedy turnaround and demand monitoring, Shein's success is also partially credited to its marketing tactics. Shein is said to have poured tens of millions of dollars into having fashion influencers film their Shein Hauls and post them to social media sites such as Instagram and TikTok and promoting its brand on American and international television (Hendelmann, 2022). A haul is when consumers film themselves sharing large quantities of items they have bought, which effectively means social media users are using their own accounts to market for brands. For example, it has hosted a virtual show that stars such as Katy Perry and Ellie Goulding participated in and sponsored shows like *The Voice* by dressing contestants in its clothes (Hendelmann, 2022). These efforts have inspired some consumers to also share their hauls on social media. Though these techniques are often used by other clothing companies, Shein is unique in gamifying its promotion. Examples of the technique include "countdown timers, subscriber discounts, trending stickers, and more to entice customers

to make impulsive purchases" which all serve to create a habit around using Shein's website or app even if the consumer does not see notifications (Hendelmann, 2022). Its presence is so dominant on social media platforms that one cannot escape from seeing it.

Though its business model is impressively profitable, it is not without its controversies. Specifically, the controversies pertain to the division of labor laws, environment impact, design plagiarism, along with religious and cultural appropriation. Hendelmann (2022) notes that a Swiss watchdog group released a detailed report about Shein's violation of Chinese labor laws by forcing workers to work more than 70 hours a week and not having emergency exits and other basic protections in all of its factories. Further, two undercover Shein factory workers found that workers frequently work 18 hours per day with just one day off per month and could be fined up to two-thirds of their daily wage if they make one mistake (Jackson, 2022). Factory workers are paid piece wages earning 0.27 yuan which is or just under 4 cents (Jackson, 2022).

Though plagiarism is common in the industry and especially among the fast-fashion brands, Shein has been called out by many designers and artists about identically copying their creations without permissions (Hendelmann, 2022). Lastly, Shein is infamous for selling a swastika necklace as a Buddhist symbol and Muslim prayer mats as decorative rugs on its website (Hendelmann, 2022). In addition, shoppers have filed over 1000 complaints to the Better Business Bureau regarding the poor quality of Shein's products (Yip, 2022). These issues have led many to boycott against the brand while some look past them because of the affordable price tag.

Supplier Sustainability Efforts

There have been several attempts by fast fashion companies to shift into the realm of sustainable production. Many retailers have started conducting marketing campaigns to highlight their dedication to environmentally friendly business practices. For example, H&M's website now includes a tab titled "Sustainability" where they pledge to "close the loop on fashion," create as little waste as possible, and accelerate the innovation of sustainable materials (H&M, 2019). Much of the sustainability efforts in place have provided the industry a new positive look, without any real structural change. There are sustainable business models in existence such as slow fashion, however they do not operate on the level necessary, in terms of response time, pricing, and quantity of resources, to outcompete and to overcome the adverse effects of the fast fashion industry.

Sustainability Practices Within Businesses

There are four elements that drive organizations to form new sustainability strategies: coercive drivers (laws and regulations), resource drivers (buyers, suppliers, and shareholders), market drivers (competitors), and social drivers (community and press) (Hoffman, 2018). When integrating sustainability practices into business models, the social and economic factors must fit with the current organizational structure, capabilities, and resources. There are several advantages to adopting sustainable business practices: keep up with market competitors, gain financial advantages, promote innovation, comply with regulations, and benefit various stakeholders (Thorisdottir & Johannsdottir, 2019). Changing the corporation's mindset to create a competitive advantage from sustainability practices is essential, but strategies must be realistic, authentic, and transparent. Marketing strategies that position businesses as heavily emphasizing **Corporate Social Responsibility** (CSR) standards and sustainability are likely to increase positive perception in consumers' minds (Thorisdottir & Johannsdottir, 2019).

Some brands have tried to become more sustainable by allowing organizations to recycle textiles through their brand operations. According to Chavan (2014), Textile for Textiles uses an automated sorting system to separate textiles by color and material. Patagonia's Common Threads program incorporates recycled fibers from old clothes in the production of new items. Reebok uses algae, natural rubber, castor oil, bark, and recycled polyester to make their products (Reebok, 2021).

Textile waste can be used in many different industries beyond the fashion industry such as building insulation, cotton materials as catalysts for water treatment plants, new textile products, automobile insulation, agricultural feeds, furniture and upholstery material, and stuffed toys. This method of recycling across industries can be quite effective in reducing solid waste in landfill, the production of virgin materials, and energy consumption (Shirvanimoghaddam et al., 2020).

Organizations have also been introducing innovative programs designed to encourage longer lifetimes for textiles. For example, Patagonia stated that they not only manufacture clothes from recycled bottles and cardboard boxes, but also offer repair and reuse programs to extend the lifespan of their clothing (Patagonia, 2021). RecycleMatch is a zero-waste initiative that offers a marketplace to trade and reuse textile commercial waste. The initiative uses a closed bidding system for corporations, municipalities, recyclers, and buyers of high-quality commercial waste to be reused elsewhere (Chavan, 2014).

In addition to incorporating the above mentioned practices, shareholders and stakeholders are pressing companies to disclose records regarding changes and innovations in their operations to achieve sustainable aims. The two most common formats that industry uses are **Global Reporting Initiative** (GRI) and **Integrated Reporting** (IR), which adopts the United Nations' Sustainable Development Goals. However, the critics have argued that the reports are not effective in enhancing sustainability because they are not mandatory; they also lack legal-binding force (Garcia-Torres et al., 2017). Additionally, in reporting their sustainability efforts, many companies employ the materiality matrix, a principle that decides which topics should be disclosed based on its impact on profit and public opinion (Garcia-Torres et al., 2017). Because the matrix considers the report's impact on the company and stakeholders, the released information lacks absolute transparency (Garcia-Torres et al., 2017). In other words, the annual report is intended to feature the company, its brands, and profitability favorably and may omit unfavorable information.

With a rise of consumer interest in sustainable fashion and increasing critique of the fast fashion industry's environmental harms, the problem of greenwashing, or deceiving consumers into believing that a company's products are environmentally friendly, has become increasingly common. In their 2017 annual report, H&M stated that the organization will work to contribute to Agenda 2030 of the UN's Sustainability Goals (H&M, 2017). Since then, they have instituted a large-scale take-back program that incentivizes consumers to bring back old clothes in exchange for a coupon or discount on future in-store purchases. However, 43% of clothing is still discarded into landfills (H&M, 2019). Furthermore, H&M produces well over 500 million garments each year, but only 0.7% of their pre-consumer waste has been recycled (Strähle & Müller, 2017). Brands have been increasingly marketing products with ambiguous terms such as "recycled," "sustainable," "green," and "eco-friendly." Within the fashion industry, there is no set definition or standard that the company must meet before putting these phrases on their labels, which may mislead consumers into believing that the garments are more sustainable than they actually are (Hoskins, 2014). Though these "sustainable" programs may not perform as they are advertised, they do, however, increase foot traffic into fast fashion retailers, thus increasing the company's sales and profits. Such programs create positive brand impressions on the consumer by creating the perception that the company is environmentally sustainable (Strähle & Müller, 2017).

The examples of greenwashing, or the exaggeration of actions' positive environmental impact, from H&M can be generalized to a broader trend of fast fashion companies appealing to

increased consumer interest in environmental sustainability (Hoskins, 2014). Brands market their products or programs as environmentally friendly and sustainable without making significant changes to their business model (Hoskins, 2014).

Slow Fashion

Though fast fashion's attempts at sustainability have room for improvement, there exists efforts to promote a green, long-lasting industry. The greatest example of this is **slow fashion**, first coined by Fletcher (2007), which acts as the antithesis of fast fashion; working to move beyond current, slow-moving sustainability efforts within the fast fashion business model to create an entirely new, sustainability-focused business model. Whereas fast fashion relies on rapid production, short lead time, fast turnovers, and lower costs of production, a slow fashion business model promotes a slow-paced and more sustainable approach to designing and making clothes. This socially conscious movement shifts consumers' mindsets from quantity to quality, urging consumers to buy high-quality items less frequently (Jung & Jin, 2014). Slow fashion has emerged as an alternative fashion market, encompassing a variation of "sustainable," "eco," "green," or "ethical" fashion movements that have appeared over time (Ozdamar Ertekin & Atik, 2014). This approach entails slowing down both production and consumption processes while emphasizing durability, both in terms of physical materials and stylistic design. On the consumption side, slow fashion moves away from fast fashion's constantly shifting trends. Products are designed to remain "in fashion" beyond fashion seasons. Garments are viewed as long-term investments, intended to last, be cherished, and generate significant experiences for consumers in contrast to the current fashion system's disposable and throwaway culture (Jung & Jin, 2014; Ozdamar Ertekin & Atik, 2014).

Slow fashion also places a greater emphasis on utilizing local materials, resources, and skills, as opposed to fast fashion's standardized and centralized systems. Although slow fashion has been gaining traction, it remains a relatively niche market (Ozdamar Ertekin & Atik, 2014). There are multiple barriers on the mobilization of a large-scale slow fashion system, both on the macro- and micro- levels, that have prevented slow fashion from gaining enough popularity to become a formidable competitor against major fast fashion companies. For example, slow fashion companies do not engage in outsourcing practices like fast fashion does, which poses a macro-level challenge. Although there is a greater awareness of the pitfalls of outsourcing among consumers, outsourcing to different countries is still effective at distancing consumers from the

social and environmental consequences of goods produced, making the ethical considerations less of an imperative. For slow fashion, the ethical considerations are prominent, and consumers want to know exactly where their clothing was produced, and by whom. Additionally, slow fashion producers do not use low-wage regions or use materials that are cheap, low-quality and environmentally harmful (Ozdamar Ertekin & Atik, 2014). With these higher production costs, in comparison to fast fashion companies, slow fashion brands have a difficult time competing financially against fast fashion companies' lower costs and lower consumer prices (F. Harris et al., 2016).

According to Ozdamar Ertekin and Atik (2014), on a micro or individual level, barriers for consumers include inconvenience, lack of funds, lack of knowledge, and lack of trust in fashion companies. Consumers often have to invest more time and resources to adopt sustainable consumer practices. Sustainable products are relatively inaccessible, priced higher in comparison to fast fashion garments, and harder to locate and obtain. Sustainable clothes are oftentimes perceived as more expensive, despite the intention of having a longer lifespan. As a result, consumers are more inclined to depend on fast fashion's cheap and affordable offerings (Ozdamar Ertekin & Atik, 2014). Consumers often lack knowledge and awareness of the social and environmental impacts of the clothing they purchase; thus, it is difficult to connect their consumption practices with the impacts of the production process.

Case Study: Patagonia

Patagonia is one of the world's biggest outdoor clothing and gear companies, and unlike fast fashion companies, it is known for its focus on environmentally friendly production and retail practices. Patagonia was founded in 1973 by Yvon Chouinard, an American environmentalist and mountain climber who started making climbing tools because of his passion for making more durable, lighter gear (Biron, 2022). Patagonia's current headquarters is located in California, at the location of the first store. Within a few years of its founding, in addition to climbing gear, Patagonia started making rugby shirts, raincoats, gloves, mittens, and hats. The company emphasized humane working conditions: it had no private offices, there was no dress code, and employees were allowed and encouraged to take breaks to exercise and go outside, specifically to surf (Biron, 2022). Despite high prices, Patagonia had a profitable start which was not only due to their high quality clothing and gear, but also to their successful marketing and promotion of

sustainable business practices. Today, Patagonia has over 70 stores internationally and two distribution centers and is worth around $3 billion (Biron, 2022).

In 2005, Patagonia partnered with Japanese textile firm Teijin and started their Common Threads Recycling program. Patagonia collected used Capilene Patagonia base layers and Teijin recycled these products at a "fiber-to-fiber" recycling plant. Also in 2005, Patagonia started using their new polyester filament yarn with 30%-50% post-consumer feedstock, using materials from old clothes and discarded polyester bottles, uniforms, and tents (Chavan, 2014).

In addition to creating clothes from recycled materials and other sustainable clothing manufacturing practices, Patagonia also supports efforts to reduce climate change within National Parks and continues to donate to grassroots environmental organizations. In 1985, Patagonia started its 1% for the Planet program, in which the company pledged to donate 1% of all its profits to these organizations. According to their website, since then, Patagonia has given "over $140 million in cash and in-kind donations to domestic and international grassroots environmental groups making a difference in their local communities" (*1% for the Planet - Patagonia*, n.d.). Patagonia also has an effort to increase reusing and recycling gear called Worn Wear, where customers can return old gear and clothing, which is then fixed and resold for lower prices. Customers who bring back their used items can receive in-store credit (*Worn Wear - Better Than New*, n.d.). On their website, there is a page dedicated to activism, which provides information and resources for how to take action to do something about the climate crisis.

In 2020, Patagonia made headlines for suing the Trump administration for trying to reduce the size of two national parks in Utah. The Trump administration was essentially handing over public, protected land to corporations who wanted to use the land for drilling and mining. Although the court case never reached a final decision, when Biden took office he restored protections to the national parks. The company had been involved in politics since its foundation, but had never directly taken legal action against the government until this case (Gelles, 2018). In September of 2022, Chouinard transferred ownership of the company, valued at $3 billion, to a trust, Patagonia Purpose Trust, and nonprofit, Holdfast Collective, giving up his status as a billionaire. The money given to this trust and nonprofit will go towards fighting climate change (Varanasi, 2022).

Despite the successful efforts to support climate justice initiatives, the company has been the target of controversies and claims of human rights violations. Patagonia states that it "strictly condemns and prohibits any form of forced labor or slavery including human trafficking, prison

labor, indentured labor and bonded labor as stated in our Code of Conduct," however forced labor and slavery have been found in their manufacturing processes (*Forced Labor & Human Trafficking Patagonia's Approach for Remediation*, 2012). In 2015, Patagonia made a public statement that they had been made aware of inhumane, slavery conditions for workers in Taiwan that made some of their gear. In a rare move for an American clothing company, they vowed that it became "an urgent priority to fix it [the problem of slavery in their supply chain]" (Hensel, 2015). As recently has 2021, the company has been accused of having ties to the forced labor of Uyghurs in China. The European Center for Constitutional and Human Rights asked for a Dutch prosecutor to investigate Nike and Patagonia, among other western companies, who have been "directly or indirectly complicit in the forced labour of members of the Uyghur population in China's Xinjiang province" (Stokes, 2021). Many of these human rights violations do not seem to be well known to the public, and Patagonia remains a flourishing business with a successful marketing strategy. Despite the violations that have been found, overall Patagonia still calls itself more ethical than fast fashion companies because of the accountability it has attempted and the environmental justice efforts it partakes in.

Current Recycling Processes

Recycling has emerged over the years as an approach to the growing clothing and fiber waste problem. According to the EPA, the recycling rate for all textiles was 14.7 percent in 2018 (US EPA, 2022). Recycling is defined as the process of converting waste into reusable materials (US EPA, 2013) and waste from textile manufacturing is classified as either pre-consumer or post-consumer. Pre-consumer textile waste is produced during the manufacturing process, before products enter the consumer market. Post-consumer textile waste consists of discarded textiles that a consumer no longer needs or uses. Post-consumer textile waste consists of any type of garments or household articles, made of some manufactured textile, that the owner no longer needs and decides to discard. These articles are usually discarded in municipal landfills either because they are worn out, damaged, outgrown, or have gone out of fashion (Rani & Jamal, 2018).

Fibers are recycled by two different methods: chemical and mechanical. According to Fletcher and Grose (2012), chemical recycling is limited to synthetic fibers; mechanical recycling can be done on all fiber types. The mechanical method on non-synthetic fibers involves physically tearing the fibers in the textile to break down the fabric structure. Tearing the fibers makes them

much shorter and lowers their quality, thus the method is only suitable for bulky yarns. The synthetic fiber polyester can be recycled mechanically. In this process, the fibers can come from a mixture of "post-industrial fiber waste and post-consumer plastic," for example, PET bottles, which are "chopped, ground and melted to reform polyester chip...then extruded, processed and textured" mimic virgin polyester (Fletcher & Grose, 2012, p. 70). This mechanical method does not destroy the quality of the materials because the PET can be melted down and reformed instead of torn into smaller pieces like non-synthetic fibers. Mechanical recycling of synthetic materials provides considerable resource savings over virgin material production. It uses significantly less energy and can also eliminate some of the negative water impacts caused by re-dyeing "if waste raw materials are sorted by colour and then processed in colour-specific batches" (Fletcher & Grose, 2012, p. 70).

Chemical recycling most often refers to the recycling process in which the polymers are first depolymerized or dissolved, then the monomers or oligomers are repolymerized, and finally the polymers are respun into new fibers (Sandin & Peters, 2018). Chemical recycling of textiles with large quantities of one type of fiber, for example polyester and nylon, are well established (Beall, 2020). Nylon 6 yarn can be created by recycling post-industrial waste that was rejected in initial clothing manufacturing due to quality issues (Fletcher & Grose, 2012). Both polyester and nylon require about 80% less energy to recycle than to make the virgin materials which use intermediate chemicals from oil and convert them to fiber (Fletcher & Grose, 2012). However, chemical recycling involves multiple processes and additional chemicals, making both the process and the resulting product expensive (Beall, 2020).

Although chemical recycling methods require more energy than mechanical methods, chemical recycling still requires significantly less energy than any virgin fiber production. Chemically recycled polyester is more expensive than mechanically recycled polyester, and the manufacturing costs of recycled polyester is more expensive than that of virgin polyester (Park & Kim, 2014). When recycling natural fibers, pulling apart the fibers and re-spinning diminishes the quality of the fabric, thus making it a less desirable practice (Singer, 2011). It is more cost effective to purchase newly produced raw materials rather than recycling to create lower quality fabric.

Another way to classify textile recycling processes is by comparing the quality of the product before recycling to the quality after recycling. If the recycled material is of lower quality than the original product, this is called downcycling (Sandin & Peters, 2018). The most common

existing textile recycling processes are most often downcycling, with clothing and home textiles recycled into insulation materials, upholstery, mattress stuffing, and industrial rags (Sandin & Peters, 2018). According to the Ellen MacArthur Foundation, less than one percent of material used to produce clothing is recycled into new clothing (Ellen MacArthur Foundation, 2017). Meaning, most waste that is produced from the fashion industry is not recycled back into the fashion industry. Additionally, fabrics made from recycled materials are rarely sold in retail clothing. One of the most popular indefinitely recyclable fabrics is polyester, however the recycling process has not been entirely commercialized or upscaled for mass production.

Another contributing factor that limits the textile recycling industry is the lack of clear sorting systems. Sorting determines whether a product will be recycled/reused or disposed of. The quality of recycled products largely depends on the accuracy of the sorting process (Chavan, 2014). At the Trans-America textile recycling plant, there are about 300 different categories for sorting depending on the type of item, size, and fiber content (Claudio, 2007). These categories may be entirely different to those of a different plant as sorting is entirely subjective. At Oxfam's Wastesaver clothes sorting and recycling plant in Yorkshire, UK, about 6 tons out of 80 in a week are of such poor quality that they are simply torn up and downcycled, and 35 percent of the clothes aren't physically recycled but go to Oxfam's partners in Senegal to be sold (Beall, 2020). Manual sorting is slow and can be problematic if the garment labels are unreadable or removed and expensive since it requires human labor (Notman, 2020). However, automated sorting systems are still in development and are not currently wide-spread. Textile recycling is currently not viewed as cost-effective and is rare among recycling plants. The difficulties associated with sorting largely contribute to this. These factors limit the amount of fiber recycled, leaving textiles to accumulate in landfills. For recycling to be better incorporated into the current clothing production system, the way clothes are designed needs to be rethought to facilitate recycling (Beall, 2020). An ideal system would be circular, with clothing waste recycled into new clothing products, and clothing products being designed for easy recycling.

Fast Fashion Consumer Behavior

The growth of the fast fashion industry has been a cyclical process of reliance from both the consumer and producer. This section analyzes various reasons as to why consumers are drawn to fast fashion retail and marketing efforts and offers a discussion on possible solutions that could minimize consumers' dependence on low cost fashion.

Throwaway Culture

In addition to fashion manufacturers' incorporation of planned obsolescence into clothing through low quality material and production processes, consumer behavior also contributes to a throwaway culture in which clothes are only worn for a short period of time before being discarded (Joy et al., 2012). Fast fashion's affordable prices correlate to consumers buying clothes more frequently (Joy et al., 2012). This enables even price sensitive consumers to regularly update their wardrobe with new fast fashion items while discarding old clothes (Horton, 2018). Throwaway culture largely relates to fast fashion's emphasis on trendy, up-to-date clothing and continuous fashion seasons. For many consumers, there is no need to buy durable clothing because the associated trend will be replaced soon with another trend; clothes are meant to be worn only for a short period of time before being discarded as unfashionable (Joy et al., 2012). The disposable nature and throwaway culture of fast fashion contributes to environmental problems. More than 15 million tons of used textile waste is generated each year in the United States, and the amount has doubled over the last 20 years (LeBlanc, 2019).

Attitude-Behavior Gap

The **attitude-behavior gap** explains how consumers can have a sustainable attitude and claim they would like to shop more sustainably, but rarely actually act on those beliefs. Although more consumers are becoming aware of fast fashion's harm to the community and planet, they find it hard not to purchase fast fashion (Horton, 2018). This is in part due to the fact that sustainable fashion companies' market share is less than 1% of the overall market, making it difficult for consumers to even find sustainable fashion options (Shen et al., 2013). Even if sustainable fashion was easier to find, many consumers' do not express any interest in buying it. Joy and colleagues' (2012) study found that while consumers are concerned about the environmental and social consequences of their non-fashion purchases, they did not apply such principles to their clothing shopping behavior. They also exhibited "relatively little guilt about fast fashion's disposability after realizing the discrepancy between their attitudes toward sustainability and their fashion choices" (Joy et al., 2012, p. 280). Interestingly, the study's participants cared greatly about sustainability, but only as it related to food, recycling, and make-up (Joy et al., 2012). Similarly, it is important to acknowledge that consumers are diverse in their concerns and some

may not care about sustainability at all (F. Harris et al., 2016). Many consumers noted that they are more than satisfied with fast fashion and see no need to switch to sustainable options (Joy et al., 2012). In another study, 30% of respondents said that quality, pricing, and styles are more important than ethical issues (F. Harris et al., 2016). Overall, many consumers do not consider sustainability to be a top priority when purchasing clothes.

A big contributor to the attitude-behavior gap is the value that consumers place on price. Research has found that "American consumers tend to pay more attention to the price of products than moral obligations, even though they express an interest in purchasing ethically" (Shen et al., 2013, p. 136). It is difficult for consumers to purchase sustainable clothing because the price point of sustainable garments are much higher than fast fashion and engaging in sustainable fashion would be economically infeasible (Lundblad & Davies, 2015). However, fast fashion may not be as cheap as consumers believe. The fast fashion industry encourages consumers to buy more clothes in larger quantities because of new styles, constantly changing clothing seasons and the low-quality materials. Therefore, the garments themselves are very cheap, but since consumers are buying much more, the total cost adds up. Sustainable clothing has a larger initial price tag but is long lasting which may result in less spending overall than fast fashion.

Consumers' Sustainability Efforts

The growth of the fast fashion industry has increased the dissemination of throwaway culture (Joy et al., 2012). As consumers increasingly buy fast fashion products in high amounts and at quick rates to keep up with quick changing fashion trends, more sustainable practices such as upcycling and purchasing clothes that are made to last become more limited and difficult.

Countering Consumerism and Throwaway Culture

Customers who are aware of the negative consequences of fast fashion and are passionate about environmental issues along with humanitarian welfare have been lowering their consumption and changing their care habits towards their clothes. Some have begun to wash their fast fashion purchases less frequently or employ proper laundering techniques to prolong the lifespans of the articles (Niinimäki, 2012). In doing so, they can preserve the fit, size, color, and other characteristics of their clothes. Others reduced the number of fast fashion products they buy overall. Still others are more conscientious and incorporate clothes that they will wear for a long period of time into their wardrobe (Niinimäki, 2012).

Niinimaki (2012) identified three categories of consumer behaviors that promise longevity and a longer possession: purchase more durable clothes, create emotional attachment, and upgrade garments via repair, alter, or upcycle. The more obvious category is to purchase clothes that are more physically durable because they can better withstand washing, drying, and longer wear and consumers will be able to use clothing in this category for a longer time as they retain their original fit, color, and still look like new after a few wears. Another way to prolong a consumer's purchase satisfaction is to make them feel more attached to clothes via person-product attachment. Clothes in this category allow consumers to use products to express their personality, identity, uniqueness, or values. This is achieved when manufacturers or retailers offer customization options, limited quantities, or sell halfway-done clothing kits. Compared to mass-produced apparel, clothes that offer unique designs and made-to-measure services better meet customers' individual preferences which then leads to higher satisfaction. Lastly, consumers keep their clothes longer when there are product-related services that allow products to be changed to meet consumer's changing needs by offering a new experience. This can be achieved through providing services such as repair and alteration shops, programs that buy old clothes, and refurbishing amenities to upgrade clothes by refreshing their appearance. In addition, modification/redesign services advise consumers how to modify their own clothes and encourage them to exchange or rent products (Niinimäki, 2012).

Redesign services are an example of **upcycling**. Definitions of upcycling all express a creative reuse or transformation of a product that was considered waste into a valued product (Kyungeun, 2015). This could involve any method of customization such as size adjustment, painting, embroidering, and bleaching. Upcycling allows consumers to form a more personal connection to their clothes since they had a hands-on role in creating the finished product. That personal connection makes it more likely that the item will be used for its entire intended lifetime, instead of discarded prematurely.

Research Direction

The aim of this research is to understand and disrupt the process of purchase, use, and discarding clothing by examining consumer behavior and attitudes and offer an alternative to discarding clothes on a college campus. Thus, our project aims to answer the following research questions:

1. What are the attitudes towards fast fashion/collection of clothes? Do attitudes change/can we change attitudes?

2. Can a system of collecting, recycling, donating, and reselling textiles be developed to create a zero-fabric waste campus? Can this be replicated for application on other college campuses?

Methodology

This research assessed student attitudes and behaviors through quantitative surveys and qualitative interviews, and collected textiles and redirected them from landfills. The goal of this investigation was to create a blueprint for other universities and communities to develop their own zero-fabric waste system.

Participants

This study focused on students who lived on campus - the University of Maryland, College Park is a land-grant university located in the Mid-Atlantic. According to the Department of Resident Life, approximately 9,601 students lived in the 39 residence halls on campus (*Residence Halls*, n.d.).

Measures

Measures included the Survey of Attitudes and Behaviors (Appendix E), the Collection Bin Survey (Appendix G), and the interviews during Earthfest (a sustainability event celebrating Earth day at UMD, Appendix H).

Materials

Clothes and other textiles were collected in 40 gallon cardboard boxes (Appendix G). A flier titled "Clothing Discard Bin" was featured on each bin, describing the purpose of the research. It also included a QR code linking to the Collection Bin Survey. Surveys were given through Qualtrics software and estimated to take 5 minutes to complete. Participants completed the surveys on their personal devices.

Clothing from the collection bins and other materials (glue, fabric markers, scissors) were provided at Earthfest for the upcycling event.

Procedures

Survey of Attitudes and Behaviors

After obtaining IRB Approval, the survey was released on October 1st, 2021 and results were collected up until October 22nd, 2021 for a total of three weeks (see Appendix C for timeline). The link to the Qualtrics survey was distributed online through UMD email lists, professors, student clubs, Resident Life, other on-campus organizations, and social media. Survey participants were provided with IRB approved consent waiver which informed participants about the survey, eligibility requirements, duration, and deadline for completing the survey (Appendix F). Participants were instructed to answer each question as fully and honestly as possible. The survey asked 34 questions (excluding the consent waiver and raffle interest) and was estimated to take 25 minutes to complete. Question topics included impressions and words that describe fast fashion versus sustainable fashion, spending habits, buying patterns, and the impact of the Covid-19 pandemic (Appendix E). Response types included multiple choice or multiple select, slider, 5-point Likert scale, rank order, and free response. Participants were also asked seven demographic questions: year in school, housing situation, academic college in UMD, age, race/ethnicity, gender, and family income. The survey was incentivized through a lottery for the chance to win one of two $20 Terrapin Express gift cards (Appendix B). By taking the survey, participants acknowledged that they gave their informed consent. Email addresses were collected for those who wished to participate in the lottery by redirecting participants to a separate survey to maintain confidentiality. To conduct the raffle, email addresses were collected and assigned to numbers (Appendix F). Using a random number generator, two numbers were pulled and the corresponding emails were provided to the UMD Gemstone Financial Director to receive the $20 amount to their Terrapin Express accounts.

Collection Bins

Researchers sent an IRB-approved email to the resident hall and apartment directors in October 2022, requesting to place the collection bins in the campus residences (Appendix G). Permission was granted and the team placed one collection bin in the lobbies of 25 residence halls and 2 university-owned apartment communities for one month, starting November 2nd, 2021 (Appendix D and E). One bin was placed at the Courtyards community building and three bins were placed by the three front desks for the 7 South Campus Commons buildings. The poster on the bin instructed students to place clean and dry articles of clothing or textiles in the bin and

encouraged them to take the displayed survey (Appendix G). The team also accepted costume donations from the Clarice Performing Arts Center.

At the two-week mark of the collection period, researchers checked on the bins' status at each location. Reminders were distributed through email mailing lists and social media to encourage students to donate (Appendix F). At the conclusion of the collection period, researchers collected the bins and clothing for storage and analysis. The team rented a 10'x15' unit that cost $211 per month for seven months from March to September 2022 (Appendix B).

Sorting

The team took a sample of 344 pieces of clothes and recorded their respective attributes relating to garment type, description (pattern and color), material, brand, collection source, condition, Good On You rating, button/zipper presence, potential (good for resale and reuse, donation, or upcycling), and brand. Good on You is a fashion brand rating tool that considers a brand's impact in the world through its entire supply chain from raw materials to a product's end of use while the condition score is based on the visual examination of a piece's physical condition (Good on You, n.d.). The ratings are defined by GOY as follows:

1. **We Avoid** - These brands disclose little to no relevant or concrete information about their sustainability practices. In some cases, the brand may make ambiguous claims that are unlikely to have a material impact.

2. **Not Good Enough** - These brands disclose some information in one or more areas and consider some material issues but do not yet adequately address the impacts across their supply chain.

3. **It's a Start** - These brands are transparent about their policies and practices to manage some material issues and are making good progress on one or more of them.

4. **Good** - These brands adopt policies and practices to manage multiple material issues across their supply chain and often demonstrate leadership in one or more areas.

5. **Great** - These brands demonstrate leadership in all three areas (People, Planet, and Animals). They are typically very transparent and have both strong policies and strong assurance (e.g. from relevant certifications or standards systems) to address the most material issues across their supply chain (Good on You, n.d.).

The potential of the garments also received a condition score defined as follows:

1. **Poor** - very ripped, stained, and ragged; unwearable
2. **Very Used** - moderately stained or ripped
3. **Good Used** - in good shape and can be worn again
4. **Excellent Used** - Almost new but without a price tag
5. **New with Tags** - new with price tag

Donations were sorted for distribution into three categories: upcycling, donation, and recycling. Since a bulk of donations were received from The Clarice Smith Performing Arts Center, those items were separated into a theater category. Clothing in each category was weighed. Standards for sorting were based on quality, appearance, material, and durability. Criteria for each category were as followed: Clothes and textiles for upcycling consisted of a small number of garments selected from materials unsuitable for donation. This portion consisted of clothes that required small or no adjustments, minor fixes, and large, durable t-shirts. Donated clothes and textiles consisted of garments that were good quality (clean, with few or no holes). This portion consisted of clothes and textiles for reuse or resale. Recycled clothes and textiles represented the remaining portion of textiles that could not be upcycled or donated. This consisted of single-material garments with stains, holes, and other damage. Recycled textiles did not include those with buttons, zippers, and other accessories that will inhibit the recycling process (Chavan, 2014). These materials must be suitable to be repurposed into rugs, mattress filling, and materials for other industries. A minimum weight requirement must be met for the textiles to be accepted for recycling.

All the clothes collected were suitable for donation and no clothing was recycled. Clothing was sorted by item: costumes, dress clothes, t-shirts, sweaters/jackets, other tops, jean pants/shorts, dresses/skirts, undergarments, accessories, and children's clothing. The clothing was inventoried by recording garment type, description (color and pattern), material(s), brand, if it is fast fashion, where it is from (Clarice or the collection bins), the condition on a scale from 1-5 (1 - poor to 5 - new with tags), the presence of zippers or buttons, its distribution category, and other miscellaneous notes. Clothes intended to be given away and t-shirts for upcycling demonstration were further separated.

Distribution

Costumes received from the Clarice Center for Performing Arts were donated to a local theater group and the remaining clothes and textiles were donated to the local Value Village, a thrift store. Costumes received from the Clarice Center for Performing Arts were made available to the team through a team member who worked at the Clarice Center. The team member was informed that the old costumes are normally thrown away, and heard about our project, and allowed us to take the clothes as donations to prevent them from being thrown in the landfills.

Members of the team participated in Earthfest at UMD, where some clothes were donated to students and an upcycling project using some of the donated clothing was conducted (turning donated clothing into tote bags). It was expected that with all these donations, some clothes would be used for upcycling and donations in Earthfest.

Sustainability Survey During Earthfest Event

Researchers encouraged students who took clothes to respond to the Sustainability Survey (Appendix H). A QR code linking to the survey was provided and participants responded to the survey on their personal devices. The survey consisted of a Google form asking 19 questions about upcycling, altering, donating, and buying clothes second hand; and 7 demographic questions. The purpose of this questionnaire was to learn about students' behaviors towards these activities. This study intended to ask questions verbally in a formal, recorded interview. However, the event was on a larger scale than expected. Students also may have preferred to look around on their own and decline a formal 15-minute interview. Therefore, the interview was altered into a survey to collect data more conveniently. Earthfest was an event hosted by the Sustainability Office at UMD, celebrating Earth Day. It was expected that this group of students would be "greener" and more conscious about sustainability than the general student population, as they took the time out of their day to attend the event and participate in upcycling demonstrations.

Findings and Discussion

Summary of Findings

The Survey of Attitudes and Behaviors sought to understand participants' perspectives on fast fashion and sustainability. As expected, a positive correlation between shopping frequency and the amount spent was observed. Participants highly valued price and fit/comfort when purchasing clothing, and convenience was the top reason why they did not engage in sustainable habits such as upcycling and fixing/mending clothing. Although participants seemed to understand the concept of sustainable fashion, they were unfamiliar with brands in this category. The collection bins were used to determine the need and utility of a system of recycling and donating clothing for a zero-fabric waste campus. Almost 740 pounds of clothing was collected in one month from residence halls, suggesting that the system was successful and accessible to students. As expected, much of the donated clothing was in good condition. The Earthfest survey sought to understand student's current sustainability habits and compare them to the results of the Survey of Attitudes and Behaviors. Since those who attended Earthfest were more conscious about sustainability, it was expected that these respondents would have donated more and been more aware of sustainability. However, most students did not see the collection bins across campus, suggesting that more awareness was necessary. The Earthfest survey also indicated that a majority of respondents' sustainability practices in regards to clothing are influenced by social media trends. Overall, participants in this survey were "greener" due to the fact that they came to Earthfest to participate in upcycling, donating, and recycling events on campus. Each of these findings will be explained further in the sections that follow: Survey of Attitudes and Behaviors, Collection Bins, and Earthfest Survey.

Survey of Attitudes and Behaviors

The Survey of Attitudes and Behaviors (the survey) was released on Qualtrics and open for three weeks beginning October 1st, 2021. The survey was taken by 133 UMD undergraduate students. Out of 133 total participants, 113 (85.0%) answered all of the demographic questions representing 0.4% of undergraduate students enrolled at UMD in Fall 2021 (*Institution Data for*

UMD, 2021). The majority of responses were from typical college-age students (18-21 years), and most were women and juniors in college (Table 1). A majority of respondents lived in on-campus residence halls; either belonged to the School of Engineering or the College of Computer, Mathematical, and Natural Sciences (CMNS); and were either White or Asian/Asian American. The median income range was reported to be $200,000-249,000 which was far greater than the median household income of $90,000 of Maryland residents in 2021. Students might have been unaware of their actual family income, or may have reported their own income as a college student, which is typically much lower. Thus, data related income range was interpreted as a relative factor. Because of the focus and distribution channels, the population was skewed towards women and STEM majors. See Appendix E for survey data.

Table 1

Participants for Survey of Attitudes and Behaviors

Year	Female		Male		Gender Non-Conforming or Non-Binary		Prefer not to respond		Total	
Freshman	16.8%	19	5.3%	6	0.9%	1	0.0%	0	23.0%	26
Sophomore	15.0%	17	4.4%	5	0.0%	0	0.89%	1	20.4%	23
Junior	23.9%	27	6.2%	7	0.0%	0	0.0%	0	30.1%	34
Senior	20.4%	23	3.5%	4	2.7%	3	0.0%	0	26.6%	30
Total	76.1%	86	19.5%	22	3.5%	4	0.9%	1	100.0%	113

Note. Demographic information of participants. Participants ($N = 113$) self-assessed and assigned themselves as low, moderate, or high spenders based on their context/reference group. When asked to characterize their current spending habits, 43.4% said they spent a little on clothes, 44.2% respondents spent a moderate amount on clothes, and the remaining 12.4% respondents spent a lot on clothes.
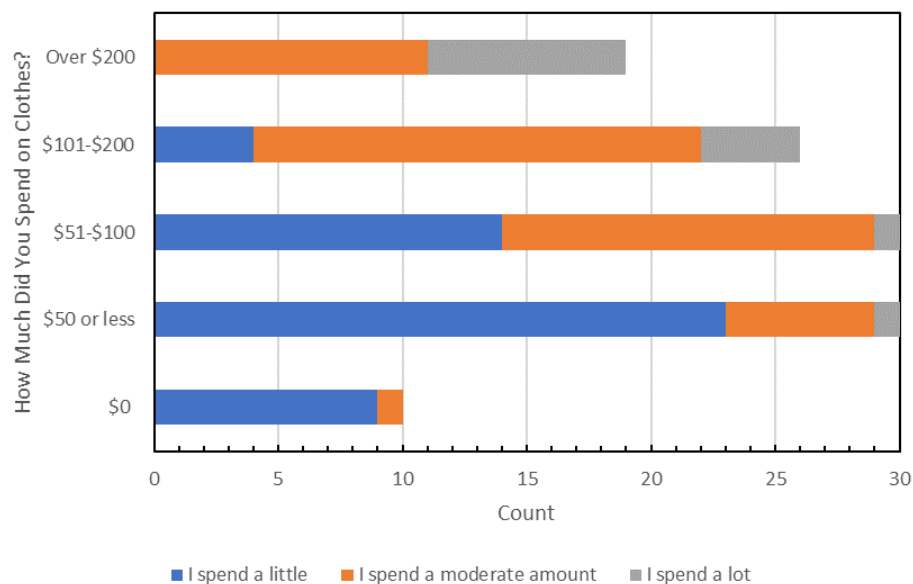
Participants were asked how much they spent on clothing purchases in the last three months (July through September 2021), 16.8% of respondents spent over $200 (Figure 1). In general, self-assessed low spenders were more likely to spend $50 or less on clothing, self-assessed moderate spenders were likely to spend $50 or more, and self-assessed high spenders were more likely to spend $100 or more. These self-assessed groups will be referred to as low, moderate, or high

spenders. It was expected that their self-assessed perception of spending habits would positively correlate with how much they actually spent. More than half of high spenders spent over $200 in the last three months while low spenders were on the opposite end of the spectrum, with 65.3% spending $50 or less. The moderate spenders were the most dispersed. Interestingly, this wide distribution among the moderate spending category suggested that participants had varying definitions of "moderate" spending. Spending may also differ across different seasons. Participants may have spent more or less money in the winter or spring compared with the months preceding the start of a new school semester. Additionally, summer and fall clothing may cost less compared to winter clothing such as coats, jackets, and boots.

Figure 1

Spending Total in the Last 3 Months vs. Spending Habits

Note. Participants self-assessed and assigned themselves as low, moderate or high spenders and indicated how much they spent from July through September 2021 ($N = 113$).

Given two shirts priced at $5 and $15 and no indication of the material, 74.8% of respondents selected the $5 shirt, regardless of how they characterized their spending habits. Looking further into the data, 74.0% of low, 76.5% of moderate, and 71.4% of high spenders selected the $5 shirt. This suggested that no matter how much they spent, respondents were conscious of price. To assess the impact of material content on purchases, participants were

presented with the choice of a "$5 top made with 96% polyester and 4% spandex" versus a "$20 top made from upcycled material, organic cotton." Nearly half of all respondents (47.8%) chose the $5 top made with 96% polyester. Looking further into the data, 52.0% of low, 47.1% of moderate, and 35.7% of high spenders selected the $5 top made with 96% polyester. As the spending category increased, the number of respondents who selected the top made with polyester decreased, indicating that higher spenders were more likely to spend more money and chose the more sustainable option. Low spenders were more price sensitive and were unwilling to trade off price for sustainability. A little more than half of moderate spenders and most of high spenders were willing to do the same. Overall, since almost half of all respondents were willing to buy the more expensive shirt, there was some kind of willingness to obtain sustainability for a higher price. However, when broken down by spending category, there was confirmation of price sensitivity among the lower and moderate spending categories.

When taking into account factors that are most important to purchase decisions, 80.6% of all respondents identified cost as the first or second most important factor. Looking further into the data 89.8% of low, 78% of moderate, and 57.2% of high spenders ranked cost as the first or second most important factor. In general, self-described high spenders were less likely to indicate cost as the most or second-most important factor when making a clothing purchase. Accessibility and convenience were also less important factors in making a clothing purchase decision for higher spenders, than those who spend little to moderate amounts on clothing. Those who spent the most on clothing tended to care more if the clothing was "on trend" compared to the other two groups. Based on this information, it can be hypothesized that respondents that spend a lot of money on clothing have more discretionary income to spend on clothing in order to keep up with current fashion trends. Regardless of how much money respondents spend on clothes, fit and comfort were the top two factors for 62.8% of all respondents.

Half of participants set a budget when shopping for clothes. Slightly more than half of all women set a budget, while slightly over half of all men did not. As spending on clothing increased, the budget per shopping trip tended to increase as well (Figure 2). Of high spenders, 64.3% did not set a budget while those who did typically set one between $51 - $150. High spenders cared less about setting a budget; 49% and 46% of light and moderate shoppers did not set a budget, respectively.
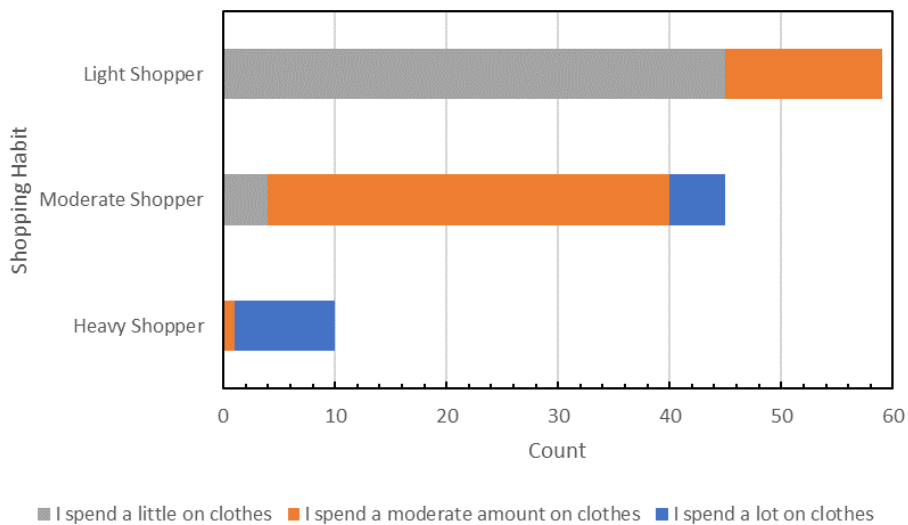
Figure 2

Budget per Shopping Trip vs. Spending Habits
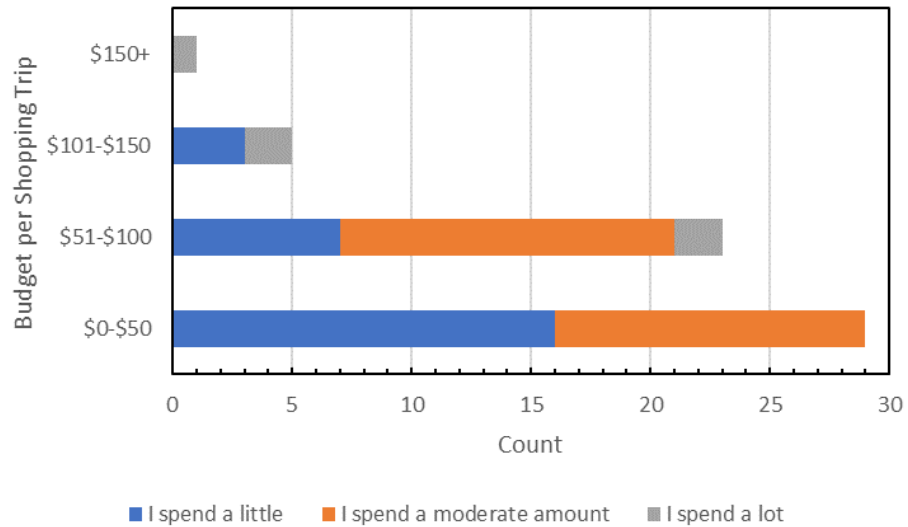
Note. Participants self-assessed as low, moderate and high spenders and indicated their budget per shopping trip ($N = 113$).

Figure 3

*Shopping Habits vs. Spending Habits*

Note. Participants self-assessed themselves as low, moderate and high spenders and self-assessed themselves as light moderate or heavy shoppers ($N = 113$).

When asked to characterize their current clothing shopping habits, (i.e. how heavily or lightly one shopped), those who characterized themselves as low spenders also identified themselves as light shoppers. These terms were not defined in the question. Similar trends were seen for moderate and high spenders, which was as expected (Figure 3). Interestingly, the self-described moderate and high spenders also classified themselves as light and medium shoppers. Men were more likely to characterize their current shopping habits as light, while women were split between characterizing their current shopping habits as light or moderate (Figure 4). No men considered themselves to be a heavy shopper.

**Figure 4**

Shopping Habits vs. Gender
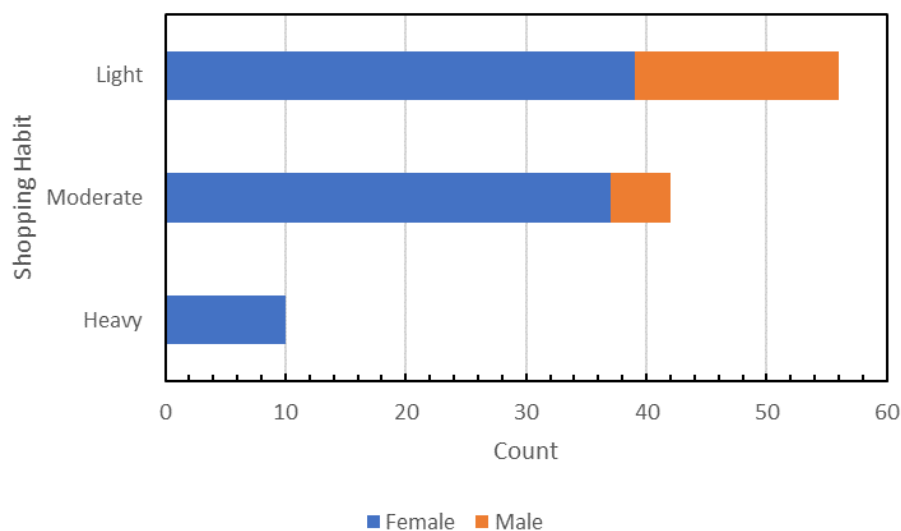
To determine factors considered when making a clothing purchase, participants ranked the following factors: cost, convenience/accessibility of buying, environmental factors, humanitarian factors, style (i.e., in trend or in season), fit/comfort, and others. Respondents picked either cost or fit/comfort as their top choice when deciding on a clothing purchase; for women, cost was typically ranked first while fit/comfort was more important for men (Figure 5 and Table 2). The high rankings of cost and fit were expected. Our findings reflect previous research, such as a 2016

survey where respondents were more concerned with quality, pricing, and styles over ethical issues, suggesting attitudes have not changed significantly in the past seven years (F. Harris et al., 2016)**.**

Figure 5

Factors Participants Considered To Be Most Important In A Clothing Purchase
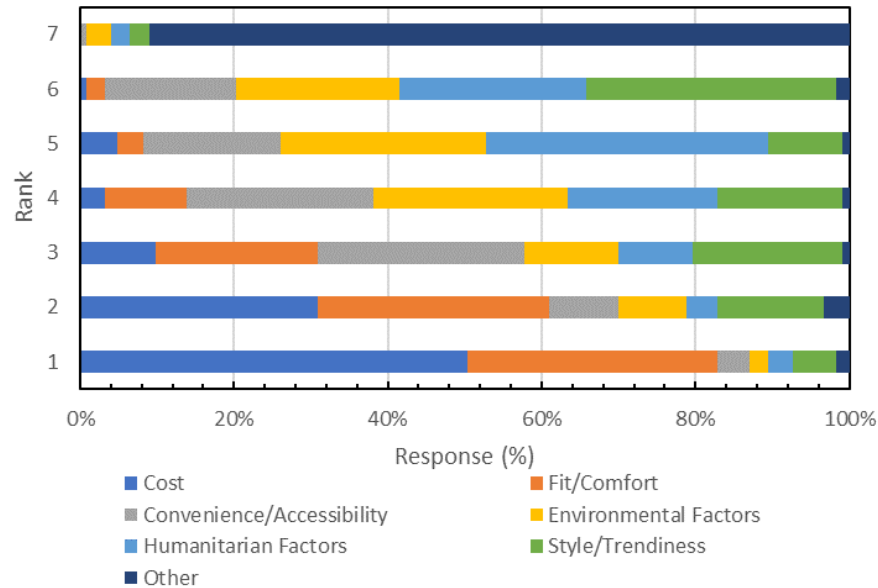
Note. Participants ranked factors they considered to be most important in a clothing purchase.

Table 2

Factors Men (M) And Women (F) Considered To Be Most Important In A Clothing Purchase.

Rank	Cost		Fit/Comfort		Convenience/ Accessibility		Environmental Factors		Humanitarian Factors		Style/ Trendiness		Other	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M
1	52.3%	36.4%	29.1%	45.5%	3.5%	9.1%	2.3%	0.0%	3.5%	4.5%	7.0%	4.5%	2.3%	0.0%
2	26.7%	50.0%	32.6%	18.2%	9.3%	4.5%	10.5%	4.5%	2.3%	9.1%	15.1%	13.6%	3.5%	0.0%
3	9.3%	9.1%	18.6%	31.8%	26.7%	31.8%	12.8%	9.1%	12.8%	0.0%	18.6%	18.2%	1.2%	0.0%
4	4.7%	0.0%	12.8%	0.0%	24.4%	22.7%	23.3%	40.9%	18.6%	13.6%	16.3%	22.7%	0.0%	0.0%
5	5.8%	4.5%	3.5%	4.5%	18.6%	9.1%	29.1%	22.7%	34.9%	45.5%	7.0%	13.6%	1.2%	0.0%
6	1.2%	0.0%	3.5%	0.0%	17.4%	18.2%	19.8%	22.7%	24.4%	27.3%	32.6%	27.3%	1.2%	4.5%
7	0.0%	0.0%	0.0%	0.0%	0.0%	4.5%	2.3%	0.0%	3.5%	0.0%	3.5%	0.0%	90.7%	95.5%

Note. Percentages are response rates out of each gender.

Participants were also asked to rate how important each factor was, with 0 being indifferent and 100 being extremely important (Table 3). Of all the factors, only design/style, fit/sizing, and price had a minimum rating above zero. As expected, fit/sizing and price had the highest rating from participants, averaging 83.3 and 81.2, respectively. Environmental and humanitarian factors were ranked lower, possibly because of lower levels of awareness about the industry. However, previous research has also shown that many consumers who self-identify as caring about sustainability still buy fast fashion and even after learning that fast fashion is not sustainable show relatively little guilt about their choices (Joy et al., 2012, p. 280). Men appeared to consider those factors more than women, and those in the $300k income range ranked environmental factors to second and third place, higher than any other range. Surprisingly, style/trendiness was ranked lower more frequently than any other factor. This insight contradicts the typical fast fashion business model that focuses on selling fashionable and trendy clothing to consumers. Trendiness or social media presence of a clothing style had an average rating 37.9, and was the least important factor to be considered overall.

Table 3

How Much Participants Considered Factors in a Clothing Purchase on A Scale from 0 to 100

Aspect	Minimum	Maximum	Mean	Std Deviation	Count
Fit/Sizing	5	100	83.3	16.3	113
Price	12	100	81.2	17.7	113
Design/Style	26	100	78.8	16.6	113
Durability	0	100	67.1	22.3	112
Material	0	100	64.3	23.3	113
Reviews	0	100	54.1	28.0	112
Opinion From Loved Ones	0	100	50.9	27.7	112
Sustainability	0	100	50.4	25.5	112
Trend/Social Media Presence	0	100	37.9	28.5	110

Note. A score of 100 meant the factor was extremely important to the participant and a score of 0 meant that they were indifferent.

Participants were asked to indicate how well certain statements related to perceived value such as deals, coupons, and free shipping described them (Figure 6). These are important marketing tactics to entice consumers to purchase. Convenience or accessibility of buying was also highly considered, but it mattered less for those who considered themselves to be in the higher

income ranges. However, 64.3% of heavy spenders marked trendiness as their first or second choice. Heavy spenders typically made up the largest percentage of frequent shoppers at any particular brand. This population may buy more and more often to keep up with trends, or spend more heavily because they keep up with trends. Besides these factors, 9.0% of respondents also considered how practical or necessary the purchase would be and whether or not it matched their wardrobe based on the clothes they already owned.

Figure 6

Statements That Described Participants When Making A Clothing Purchase
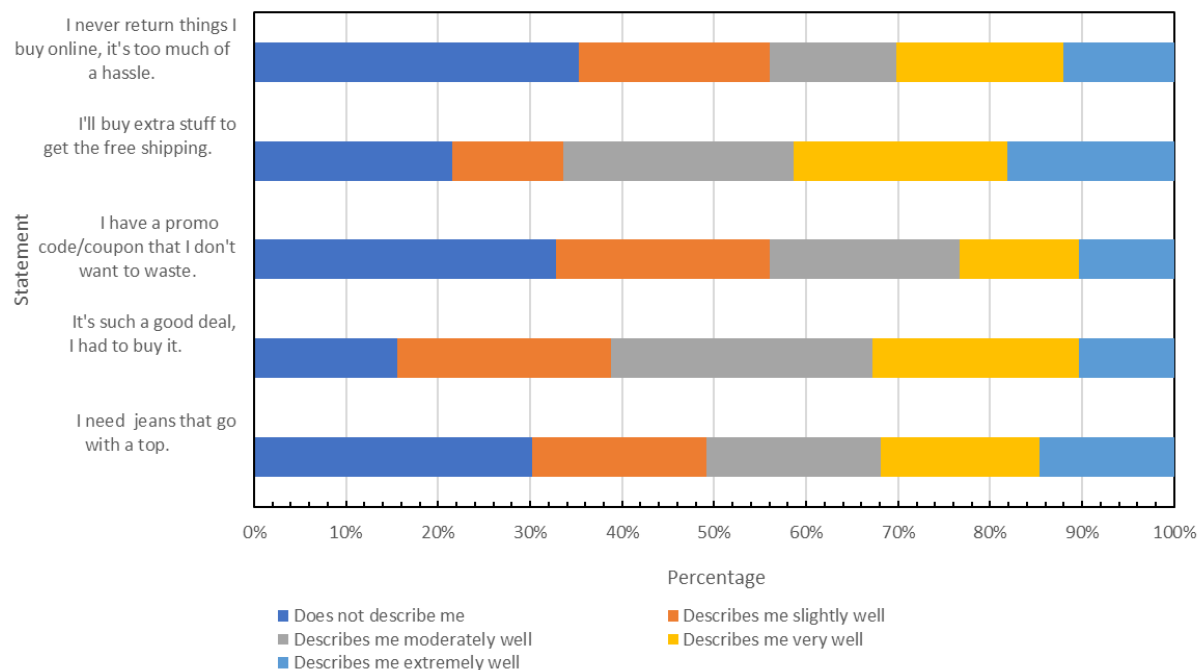
Note. Participants selected statements that describe themselves when shopping.

Participants' opinions on fast fashion, sustainable fashion, organic, eco-friendly, second hand/thrifted, and vintage descriptors were gauged by asking them to select the adjectives they associated with the category (see Appendix E for the full survey). The purpose of these questions was to understand how participants viewed these categories.

At least 63% of respondents viewed fast fashion as affordable, bad for the environment, bad quality, cheap, fashionable/trendy, and unethical (Figure 7). For each adjective, a higher percentage of women agreed with those terms compared with men. Overwhelmingly, cheap and

bad for the environment were associated with fast fashion. While cheap could be describing price, it could also describe the quality of the clothing. Interestingly, a higher percentage of men viewed fast fashion as comfortable (22.7%) or did not know the term at all (27.3%) yet none voted for good quality. For brands that sell both women's and men's clothing, there may be differences in the range of selection, material, and even quality that account for these contrasting opinions.

Figure 7

Adjectives Men And Women Associated With Fast Fashion
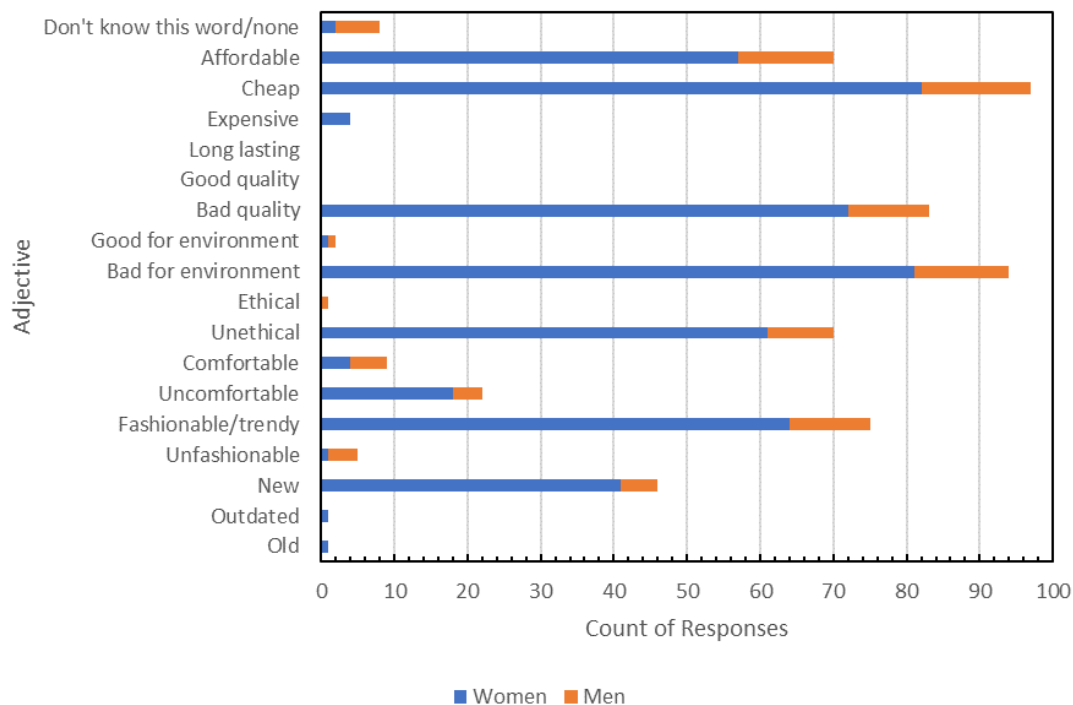
Note. Participants, identified by gender, selected adjectives they associated with fast fashion.

Participants' responses for sustainable fashion were mostly the opposite compared to fast fashion. However, perspectives were not completely conflicting; fast fashion and sustainable fashion were described as fashionable/trendy by 66.4% and 31.9% of respondents, respectively (Figure 8). Most respondents associated sustainable fashion with the terms long-lasting, good quality, good for the environment, ethical, and expensive. As mentioned previously, slow fashion aims to shift consumers' mindset towards buying fewer, long-lasting clothing items at a slower rate, as opposed to frequently purchasing fast fashion items (Jung & Jin, 2014). With price being

a major concern for most consumers when buying clothes, sustainable fashion brands can emphasize that investing in higher quality items that last longer can be budget-friendly in the long run. By highlighting the value of durable, high quality clothing, sustainable fashion brands can help consumers make more informed and sustainable purchasing decisions.

Additionally, 66.7% of the lowest income range viewed sustainable fashion as fashionable/trendy, higher than any other range. In this case, sustainable fashion may be perceived similarly to designer or luxury brands that are more expensive and unique compared to other large retail brands. Another surprising result was that 93.8% of those who self-categorized in the highest income range viewed sustainable fashion as expensive; there was also a 20-40% difference compared with responses from other income ranges. Furthermore, more heavy spenders believed that sustainable fashion was expensive and fast fashion was affordable, cheap, and trendy compared to light spenders. This suggested that heavy spenders were more likely to be consumers of fast fashion and to a higher degree in contrast to light and moderate spenders.

Figure 8

*Adjectives Men And Women Associated With Sustainable Fashion*
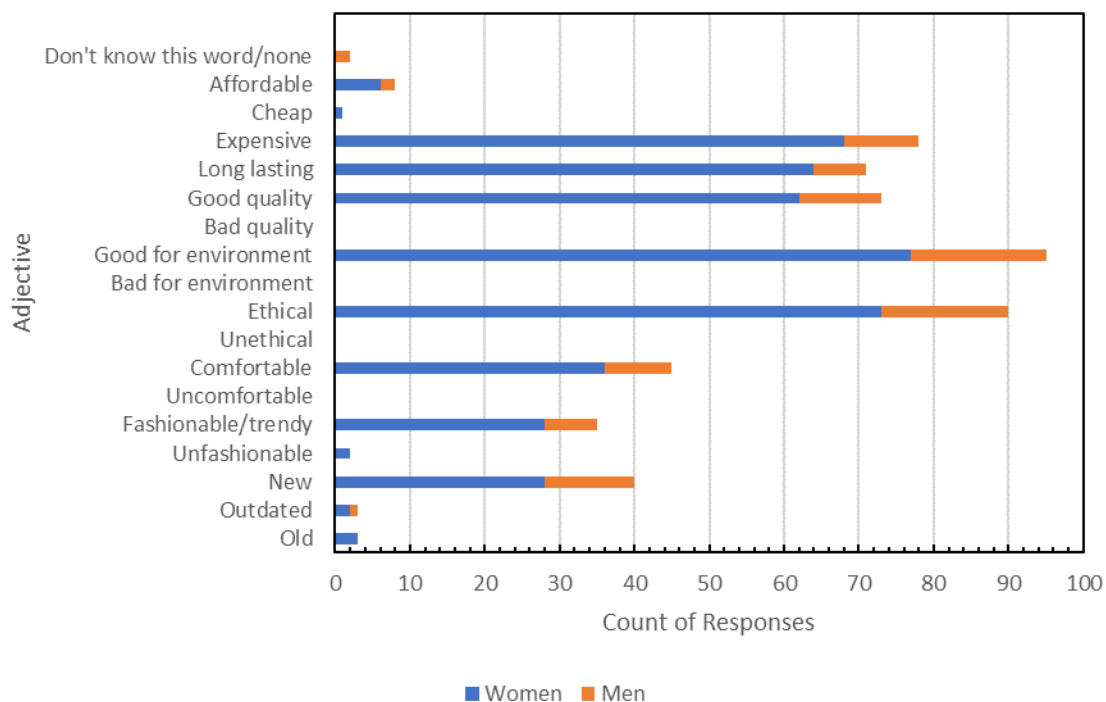
While men and women agreed that sustainable fashion was ethical and good for the environment, men were less likely to vote the same for expensive, good quality, and long lasting. In fact, men and women had the greatest difference in opinions about sustainable fashion being long lasting compared with any other result. Although men are more aware of the term sustainable fashion compared to fast fashion, messaging or advertising from sustainable brands may be too focussed on attracting women as their main consumer base. This is also reflected in the high amount of women's or unisex styles on sustainable brands' retail sites.

Participants described organic with similar choices as sustainable fashion but to a lesser extent (Figure 9). Organic was not associated as strongly with ethical, which could be attributed to greenwashing, as mentioned in the literature review. Fashionable/trendy, good quality, and long lasting descriptors were selected 20-30% less for organic compared to sustainable fashion. In particular, only 38.9% of participants chose ethical for organic in contrast to 82.3% for sustainable fashion.

Figure 9

Adjectives Men And Women Associated With Organic
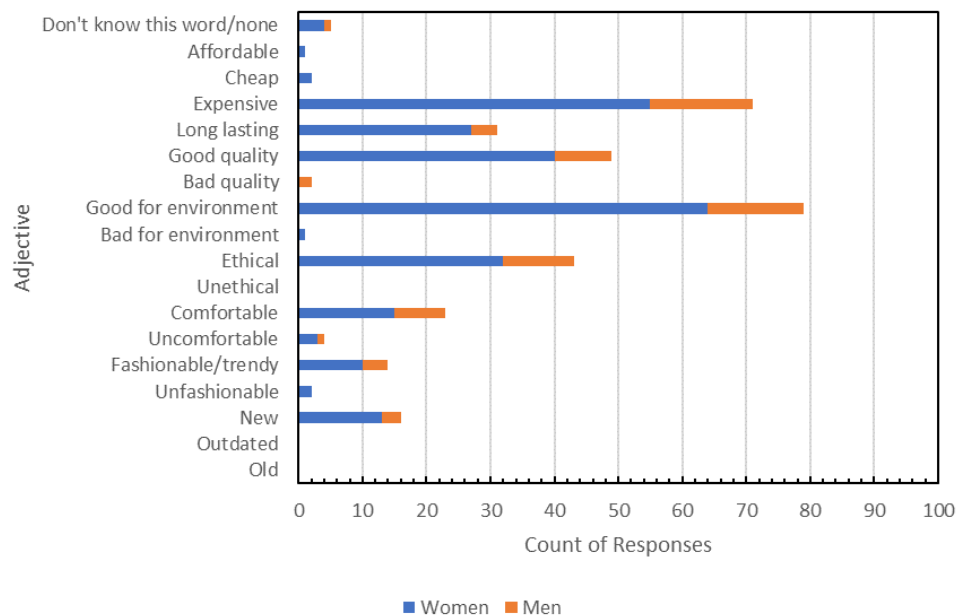
Participants who associated organic with expensive were evenly distributed across all spending habit categories. It is possible that organic food, which is much more widespread in advertising

than organic clothing, played a part in the perceived value. On the other hand, while 71.0% or more of light and moderate spenders voted for good for the environment, only 57.1% of high spenders voted for it. High spenders may have more knowledge about certain categories of fashion.

Responses for eco-friendly were very similar to those for organic, but there were two deviations (Figure 10). As expected, participants overwhelmingly associated eco-friendly as good for the environment, even more than sustainable fashion. Additionally, 10% more respondents viewed eco-friendly as ethical compared to responses for organic, although ethical was most strongly associated with sustainable fashion. Additionally, this result presented the second largest difference in opinions between men and women, with more men choosing ethical.

Figure 10

*Adjectives Men And Women Associated With Eco-Friendly*
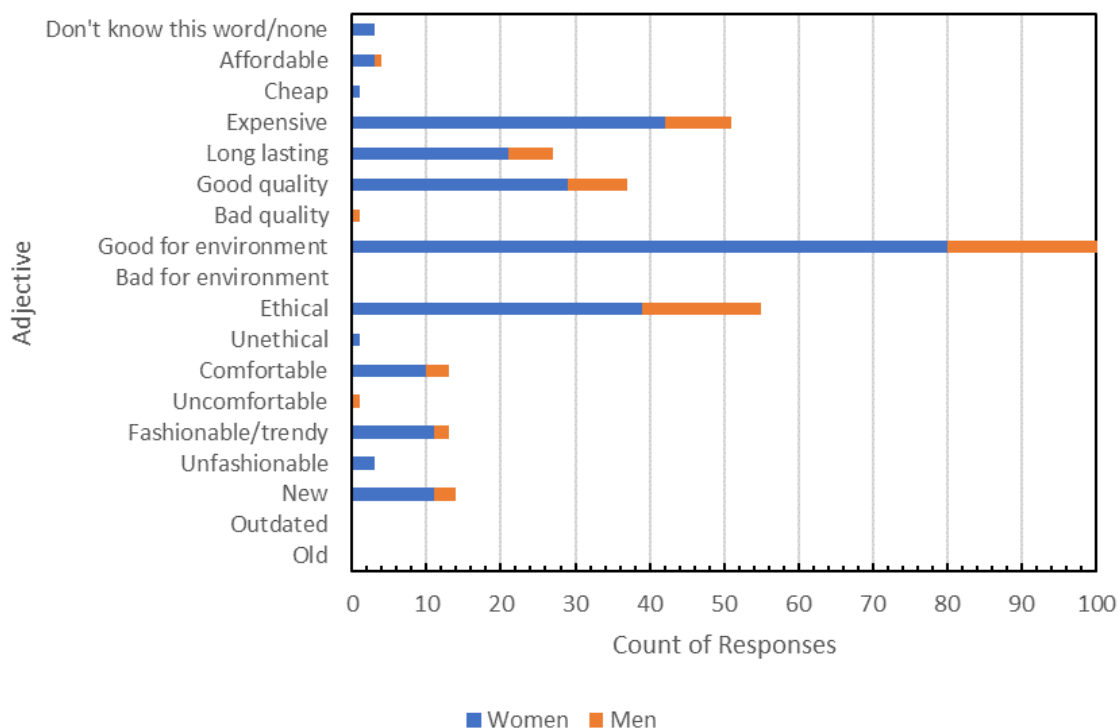
Perspectives on the second hand/thrifted category were also expected (Figure 11). However, men had stronger opinions about second hand/thrifted clothing being affordable, bad quality, cheap, fashionable/trendy, and old compared to women. Notably, 50% of men versus 34.9% of women viewed the second hand/thrifted category as trendy. This diverged from another

question where more women shopped second hand and thrifted than men. Participants may have viewed the act of shopping second hand or thrifting as trendy rather than in regards to the actual clothes themselves. Participants who viewed themselves to be in the higher income ranges were more likely to associate this category with affordable and old. Another interesting result was that 58.4% of respondents chose good for the environment, less than the previous categories besides fast fashion. Shopping second hand or thrifting is considered to be more sustainable than buying new because it diverts clothing from landfills and makes use of goods that already exist. This is only true of clothes that are sold; unsold items often end up in landfills or are incinerated (Ellen MacArthur Foundation, 2017). However, it is unlikely that enough participants were aware of the intricacies of donated clothes to consider diverting clothes from landfills as a possible result of their shopping.

Figure 11

*Adjectives Men And Women Associated With Second Hand/Thrifted*
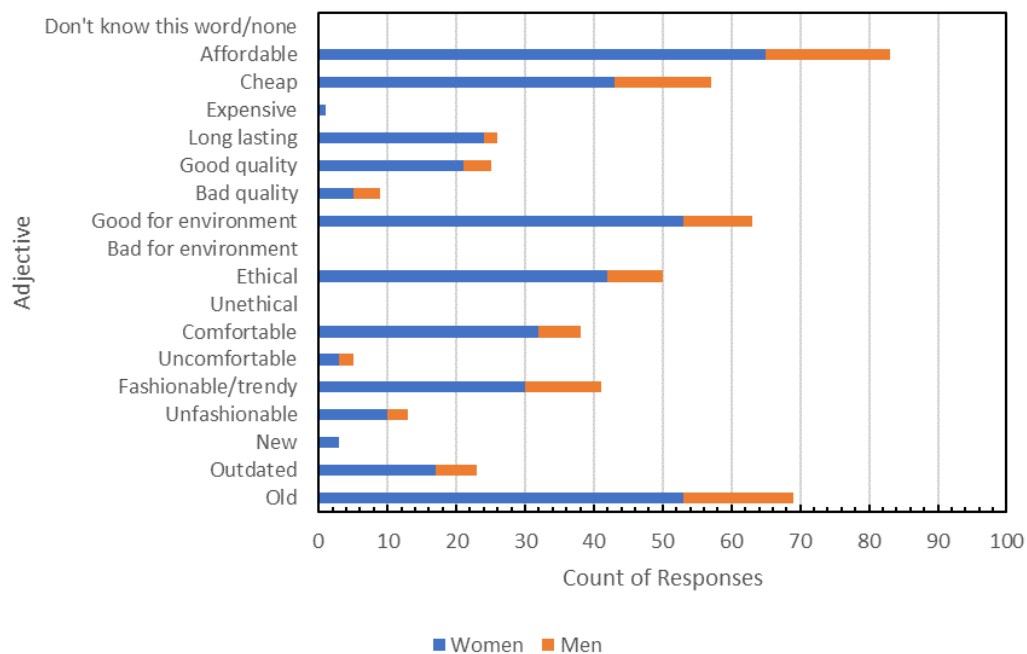
Responses for the vintage category were mostly as expected in being similar to second hand/thrifted but more expensive and fashionable/trendy (Figure 12). In fact, 81.3% of the highest income range associated vintage with fashionable/trendy. Vintage typically refers to things of

higher quality in terms of both material and craftsmanship; as such, limited edition and designer clothing or accessories are often found in vintage shops, explaining this perceived value. Despite this definition, less than a third of respondents associated vintage with good quality. This may be because of the relative age of vintage clothing, making it worn out with time. Unexpectedly, the vintage category was the second to last choice among all categories for ethical and good for the environment. While many vintage items use materials such as real fur and leather making it non-vegan, vintage items are technically still second hand but received different responses.

Figure 12

Adjectives Men And Women Associated With Vintage
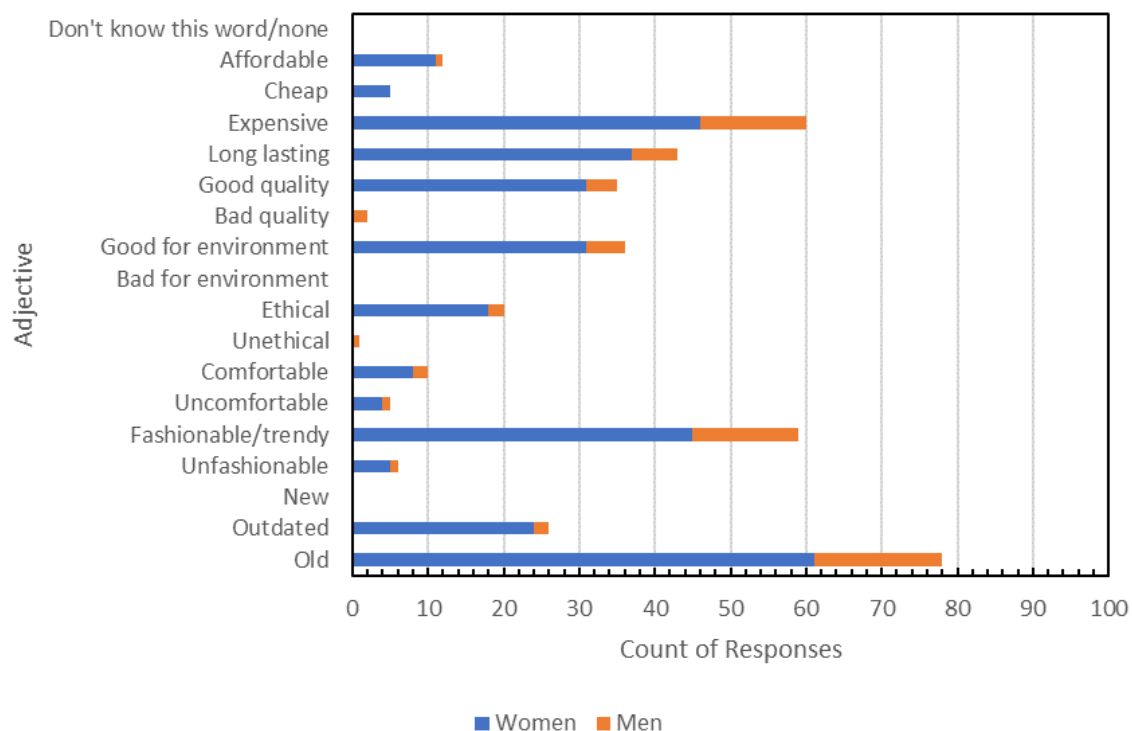
Brand familiarity of fast fashion, sustainable fashion, second hand or thrift, and other brands in between were judged using a 5-point Likert scale: (1) Never heard of it, (2) I know the name, (3) I have been to the store/website (no purchase), (4) I have purchased things from here a few times, (5) I regularly shop here. Brands that received a Good on You (GOY) score of 4 will be referred to as 'sustainable brands,' and include ForDays, Reformation, and Patagonia. Brands that received a GOY score of 3 will be referred to as 'in-between brands,' and include Adidas,

Everlane, H&M, Nike, and Uniqlo. Brands that received a GOY score of 1 or 2 will be referred to as 'fast fashion brands,' and include PacSun, Shein, Urban Outfitters, and Zara. Goodwill, thredUP, and Value Village are second hand stores and did not receive a rating. Unsurprisingly, women were more familiar with all brands and heavy spenders were more likely to have purchased a few things from the brand or be a regular.

Overall, participants were much less familiar with sustainable brands, with a majority of respondents having never heard of ForDays or Reformation (Figure 13). Between the two, Patagonia, on the other hand, had a normal distribution of familiarity and was the most recognized sustainable brand. This was likely due to the age of the brand; Patagonia, Reformation, and ForDays were founded in 1973, 2009, and 2016, respectively (*For Days Company Profile*, n.d.; "Patagonia, Inc.," 2023; *Reformation - Yael Aflalo*, n.d.). Almost 30% of participants have bought a few things or more from Patagonia; however, the brand also sells outdoor gear in addition to clothing, which may have skewed the results. Patagonia's products also attracted more male consumers, which was unsurprising. Respondents were also quite familiar with Reformation. Reformation is iconic and unique enough in the sustainable fashion world for fast fashion brands such as Shein to make 'dupes,' or knockoffs, of their styles (Pauly, 2022). At least 40% of participants knew the name or have visited the retail site. Exposure from influencers likely played a role in the brand's recognition among consumers. Price was identified as the most important factor when it came to clothing purchases, making it no surprise that only one person has bought anything from the brand. In fact, the participant was identified as a woman who was a regular shopper at Reformation and from the highest income range. Regular shoppers at Patagonia and Reformation were more likely to be heavy spenders as well. ForDays was the least recognized brand, and only women have heard of the brand or have visited the retail site. Because cost was the top factor in college students' purchase decisions and familiarity towards new sustainable brands was low, it may be more difficult to push this population to trade off price for sustainability.

Figure 13

Familiarity with Sustainable Brands
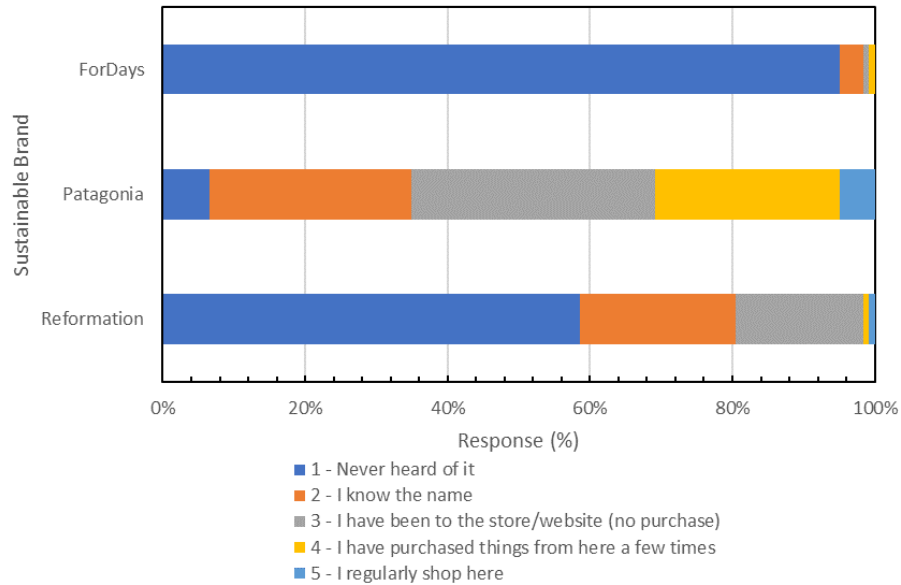
Note. Participants ranked their familiarity with top sustainability brands.

The most popular brands, in which a majority of participants have purchased a few things or were regular shoppers, included Adidas, Goodwill, H&M, and Nike (Figure 14). They all belonged to the 'in-between' or second hand brands. Respondents at least knew the name or more for the brands mentioned except H&M, which only 1.8% of respondents have never heard of. It was interesting to note that more men were regular shoppers at Adidas and Nike than women. These two brands sell athletic wear where performance and quality is important and style is not the main focus. In contrast, the fast fashion brands named in the survey are heavily marketed towards women, despite selling products for men as well. Surprisingly, Everlane received a GOY score of 3, despite its message about its commitment to sustainability. They are marketed similarly to other sustainable brands, but have been involved in disputes about the brand's actions and claims of being ethical (Testa et al., 2020). Cases like this make it difficult for consumers to differentiate brands that are sustainable from those that greenwash. While a majority of participants have never heard of Everlane, there was one woman in the highest income range who was a regular shopper, much like the Reformation regular. She was also a regular at H&M, Nike, Patagonia, and Shein. After Adidas and Nike, H&M was the next brand where participants have purchased the most from.

Figure 14

Familiarity with 'In-Between' Brands
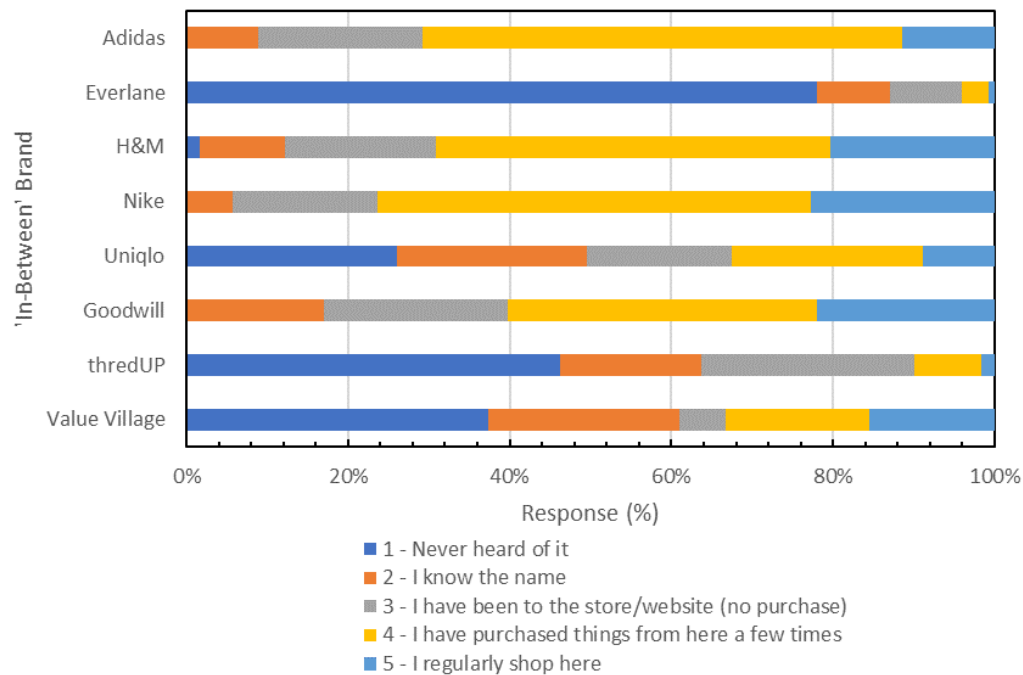
Note. Participants ranked their familiarity with brands that are not sustainable but also not fast-fashion.

Of the second hand stores, Goodwill was more popular than thredUP, an online consignment and thrift store, with almost 60% of participants having bought clothing from Goodwill or more. Almost similar proportions of women and men have purchased a few things from Goodwill, women were more likely to be regular shoppers. Another interesting finding was that moderate and heavy spenders were more likely to regularly shop at Goodwill, which wasn't the expected population for the brand.

Among fast fashion brands, Urban Outfitters was the most well known, and men were less familiar with the brands as they are mostly targeted towards women (Figure 15). Although Shein appeared to be the least recognized brand, it was mostly men that had never heard of the name. Low spenders were less familiar with the brand, whereas heavy spenders were more likely to have made a purchase from Shein. Shein also attracted consumers from all income ranges, primarily due to its affordable prices. As one of the most famous fast fashion brands today, it was surprising that participants were not as familiar with Shein. It may be because Shein is an online retailer and

has only begun to open physical stores recently in Asia, compared with other brands that have physical stores in the U.S. Often seen as the pioneer of the fast fashion business model, Zara was the second most recognized fast fashion brand. Most men just knew the name, whereas most women have been to the store or retail site without purchasing anything.

Figure 15

Stacked Bar Chart of Familiarity Towards Fast Fashion Brands
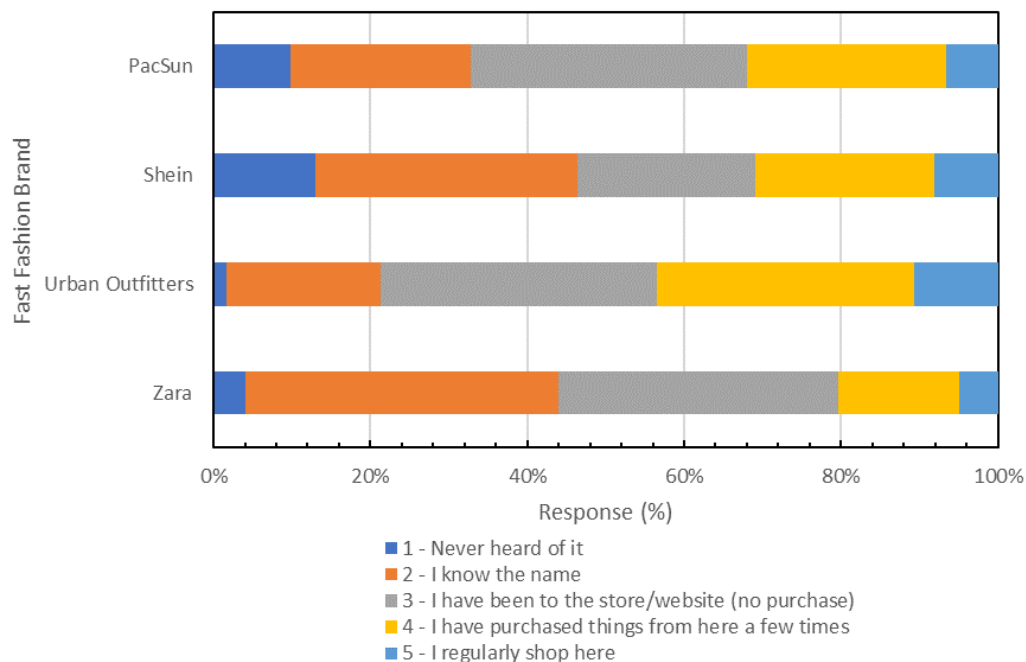
Note. Participants ranked their familiarity with fast fashion brands.

Participants were also asked why or why they don't participate in sustainable activities, including shopping second hand, thrifting, upcycling, and fixing/mending clothes (Figure 16). Overall, more respondents shopped second hand or thrifted than upcycling or mending clothes. As expected, the top reason was to save money. Men were less likely to have time or know how to do any of those activities, and of the men who did these activities, they were less aware about the fast fashion industry than women.

Figure 16

Reasons Why Respondents Participated In Sustainable Activities
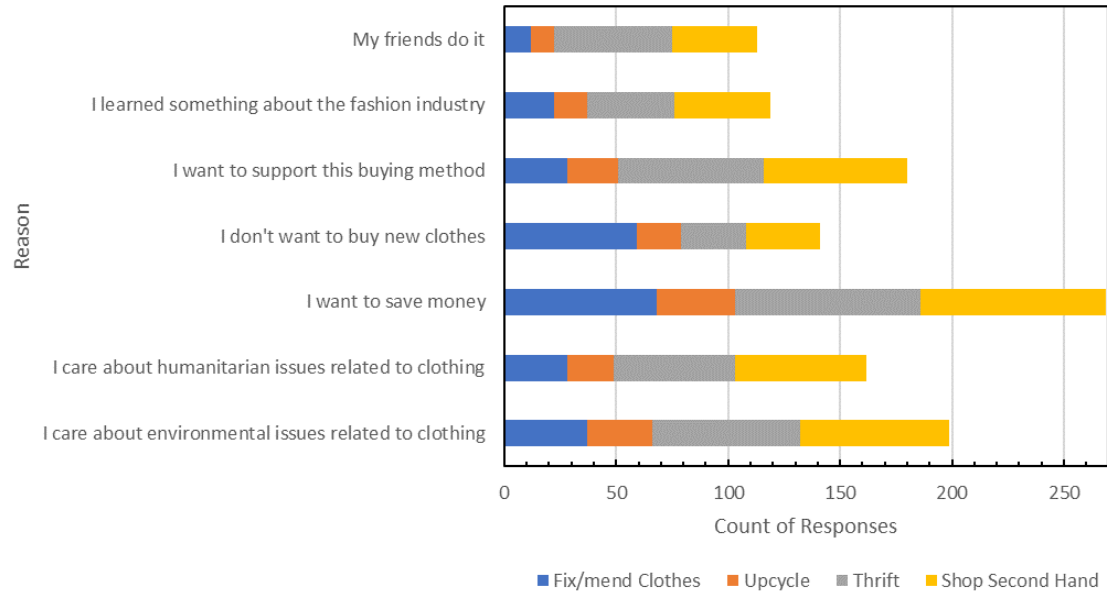
Note. Participants ranked their top reasons as why they participated in sustainable activities.

Figure 17

Reasons Why Respondents Did Not Participate In Sustainable Activities
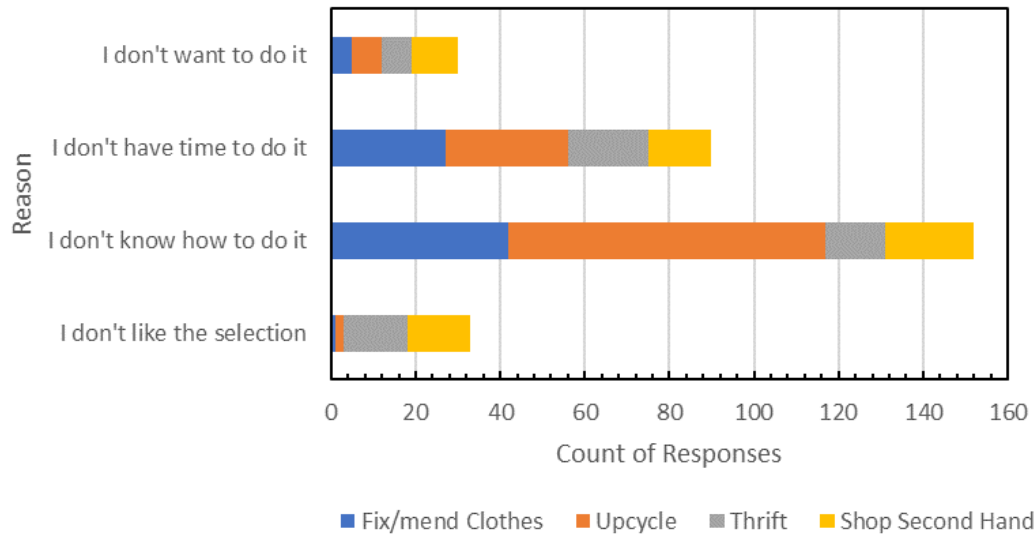
Note. Participants ranked their top reasons as why they did not participate in sustainable activities.

Although responses for shopping second hand and thrifting were similar, more people thrifted because their friends did it. This supported the previous analysis that the activity of

thrifting is seen as trendy. Additionally, a little over half of participants did these activities because they cared about the environment, which was consistent with the percentage of those who associated the thrifted category with good for the environment. Fixing or mending clothes was the third most common activity, being the top choice for those who did not want to buy new clothes (Figure 17). Upcycling was the rarest activity among participants. Almost 75% of men did not know how to upcycle, and the lack of time was equally a concern for men and women. Only 5.3% of respondents did not want to upcycle, indicating that if they fit the other criteria (knowing how or having time), they would. Overall, convenience seemed to be the biggest factor in why participants did not participate in sustainable activities.

Almost 70% of participants shopped for clothes monthly without necessarily buying anything in store online from July to September 2021, and 8.8% (10 respondents) did not shop at all in that period. Overall, most respondents shopped for clothing monthly, with similar trends across men and women (Figure 18).

Figure 18

Shopping Frequency within the Last 3 Months vs. Spending Habit
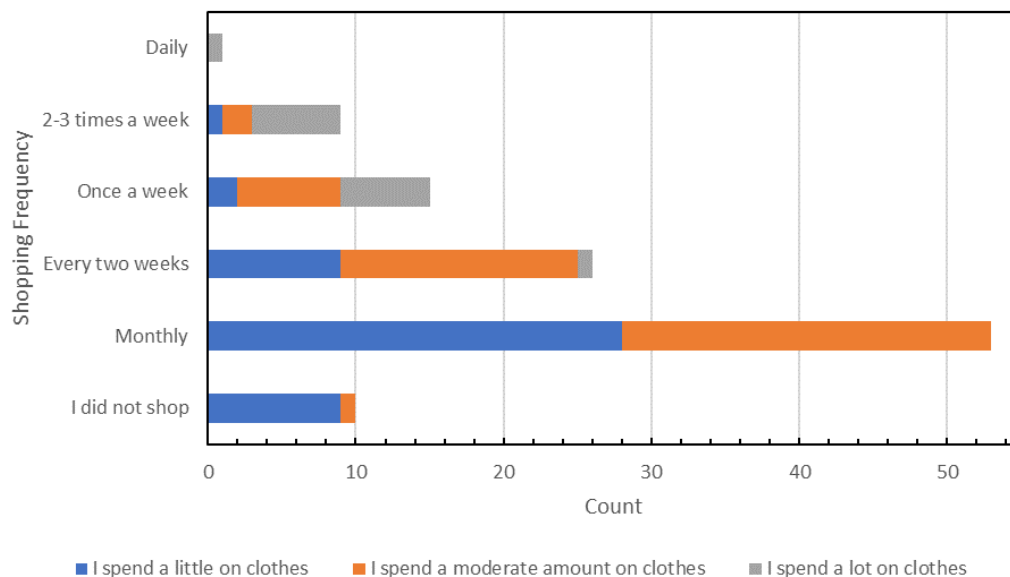
Note. The last 3 months indicated July through September 2021.

Respondents across all income ranges reported shopping for new clothing every two weeks or monthly more often than other categories. This is interesting to note because it was expected that

those with higher income ranges would be more likely to shop more often, but most respondents reported shopping every two weeks to a month. In comparison to spending habits on clothes, high spenders tend to shop more frequently compared to the other groups; 92.9% of high spenders shopped for clothes 2-3 times a week or more. Those who said they spend a little on clothing, approximately 75% of them shop every two weeks or monthly. About 82% of moderate spenders shopped every two weeks or monthly as well. Moderate spenders were more likely to shop every two weeks than low spenders, while low spenders were more likely to shop monthly.

Participants were also asked if they shop for clothes with others, how often they find themselves purchasing clothes. Participants were more likely to purchase clothes when shopping for clothes by themselves than when shopping with others (Figure 19). Of the respondents who did not shop within the past 3 months, 30% said they never find themselves purchasing clothes for themselves when shopping for clothes with others, 40% of that group said rarely and only 20% said about half the time (Figure 20). Of those respondents who shopped daily, 100% said they sometimes find themselves purchasing clothes when shopping for others. Of respondents who shopped 2-3 times a week, 11.1% rarely purchased clothes for themselves, and 22.2% did so sometimes and half of the time each. Of those who shop 2-3 times a week, 44.4% end up purchasing clothing for themselves most of the time. Most of the respondents who shop once a week, end up purchasing clothing for themselves most of the time. Of those who shop every two weeks, 26.9% rarely purchased clothing for themselves, while 3.85% of that category always end up purchasing something for themselves. Finally, those who shop monthly, 33.96% rarely end up purchasing clothing for themselves. Overall, those who shop 2-3 times a week to once a week end up purchasing something for themselves while shopping for others most of the time, while those who shop daily or monthly, did not end up purchasing something for themselves while shopping for others.

Figure 19

Shopping Frequency vs. Clothes Purchase Frequency When Shopping Alone
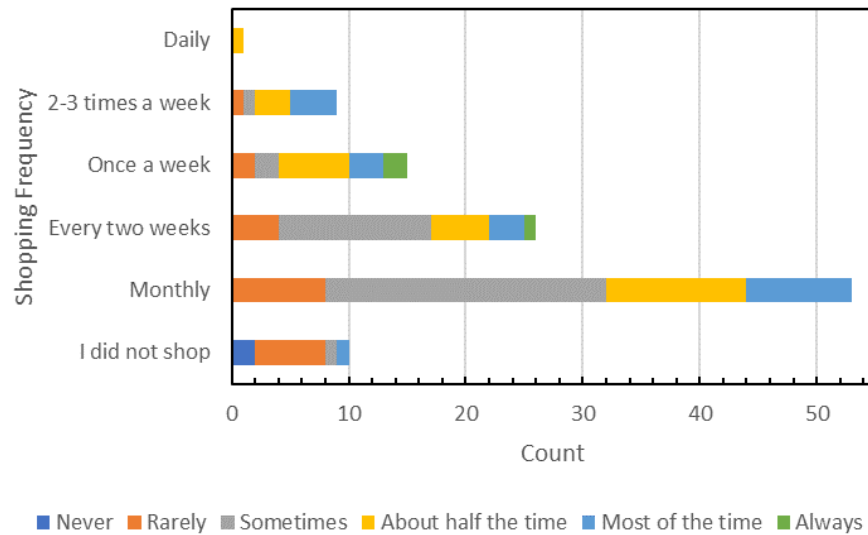
Note. Shopping frequency within the last 3 months versus purchase frequency when shopping for clothes alone. The last 3 months indicated July through September 2021.

Figure 20

*Shopping Frequency vs. Clothes Purchase Frequency When Shopping With Others*
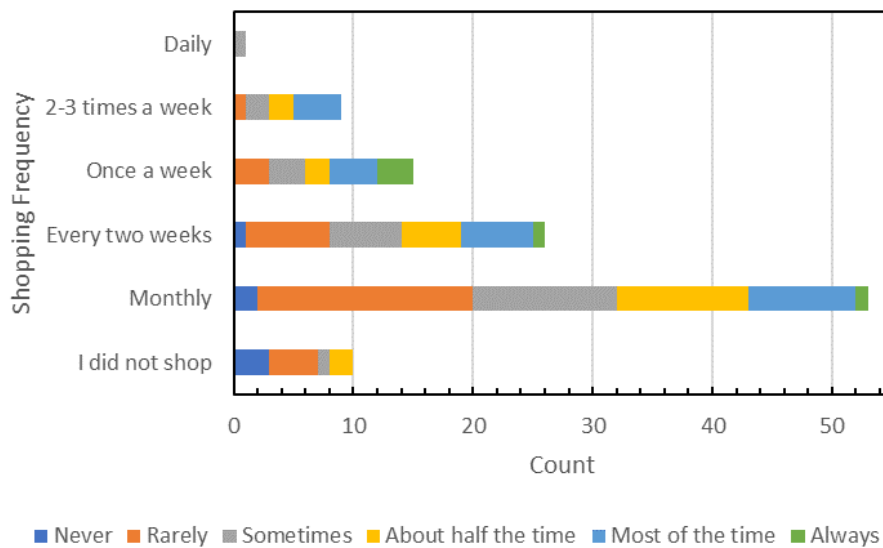
Note. Shopping frequency within the last 3 months versus purchase frequency when shopping for clothes with others. The last 3 months indicated July through September 2021.

Another aspect of this survey was to ask participants questions about how the COVID-19 Pandemic has impacted their buying and/or shopping habits. To have a standard time frame, the survey stated that the COVID-19 lockdown started in March of 2020, when UMD students were sent home. Before the pandemic, 53.5% of respondents said they spent a little on clothes, 36.0% said they spent a moderate amount and 10.5% said they spent a lot of money on clothing (Figure 22). Participants appeared to spend slightly more during the pandemic, with those who stated they spend a moderate amount on clothing increasing more than those who said they spend a lot on clothing. Overall, participants spent more money on clothing during the Covid-19 pandemic in a 3 month period. Before the pandemic, in Fall 2019, 85.1% of respondents spent $200 or less on clothing, while only 5.3% spent more than $200 (Figure 22). During the pandemic, participants who spent less than $200 dropped to 74.8%, but those who spent more than $200 tripled, jumping to 16.5%. Despite delays in transportation due to the pandemic, online shopping became more convenient and popular. This was also seen in businesses that offered grocery delivery services, contactless pickup, and food delivery. Convenience and accessibility of shopping has already been established as a top factor in purchase decisions for participants; this increase in spending was expected.
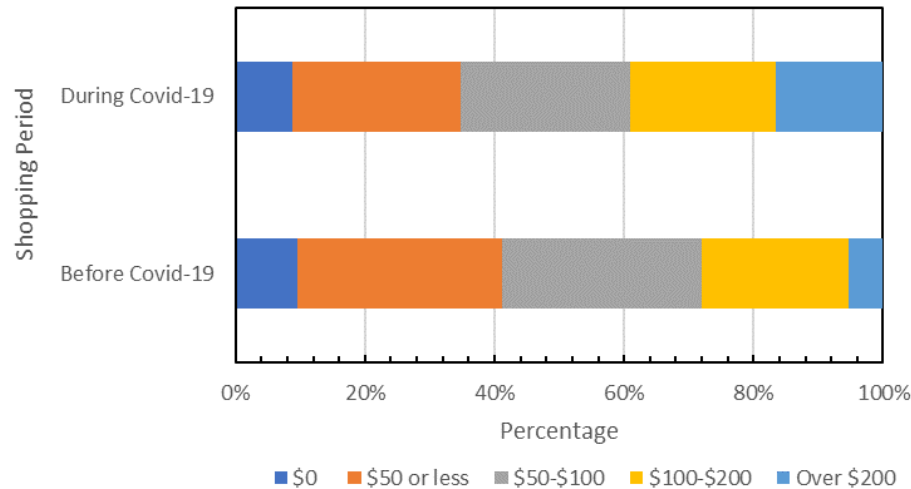
Figure 21

Spending Habit Before and During the Covid-19 Pandemic
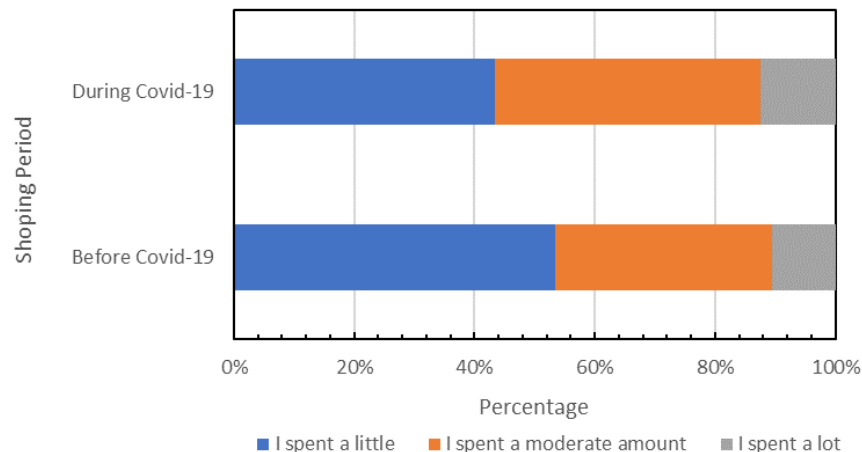
Note. The Covid-19 Pandemic started in March of 2020.

Figure 22

Spending During a 3-Month Period in the Fall Before and During the Covid-19 Pandemic


Note. The Covid-19 Pandemic started in March of 2020.

A little over half of all respondents observed that their spending habits on clothes have changed since the Pandemic. Since the pandemic, there was a good distribution of people who shopped more due to different reasons. Of those who spent a lot on clothing before the lockdown, respondents said they shopped less because they were: more budget conscious due to the economic effect of COVID-19, shopped less because they were pleased with their closet or wanted to use their money for something else (Figures 23 and 24). Those who spent a moderate amount of clothes before the lockdown shop more because online shopping makes buying items more convenient, because the lockdown and social restriction have been lifted, while the other half said they shop less because they want to use their money for something else or because they do not really have anywhere to go. Of those who spent a little on clothes before the lockdown, 23.7% shop more now because they have changed their clothing styles, while 18.4% said they shop less because they want to use their money for other things. Overall, it seems that there was a mix of respondents who shop less since they want to use their money for other things or that they are conscious due to the economic effects of COVID-19. On the flip side across all respondents, a quarter of respondents said they shop more because they have changed their clothing style since the pandemic.

Figure 23

Reasons for Shopping More During the Pandemic vs. Spending Habit Before the Pandemic
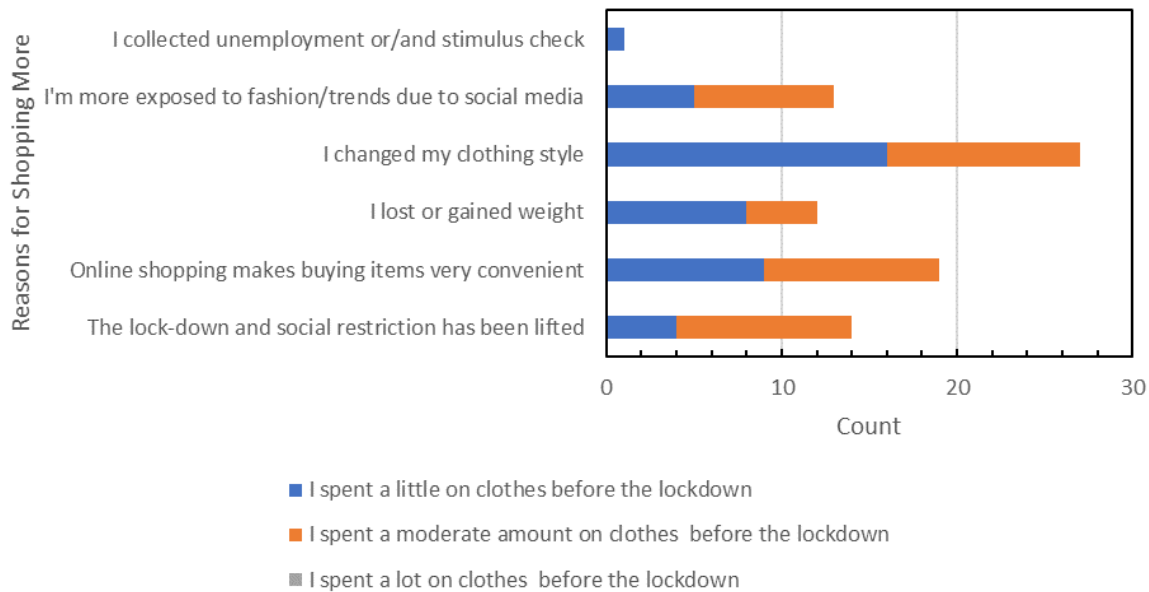
Note. Before the lockdown is before March 2020 (specifically in Fall 2019 semester).

Figure 24

Reasons for Shopping Less During the Pandemic vs. Spending Habit Before the Pandemic
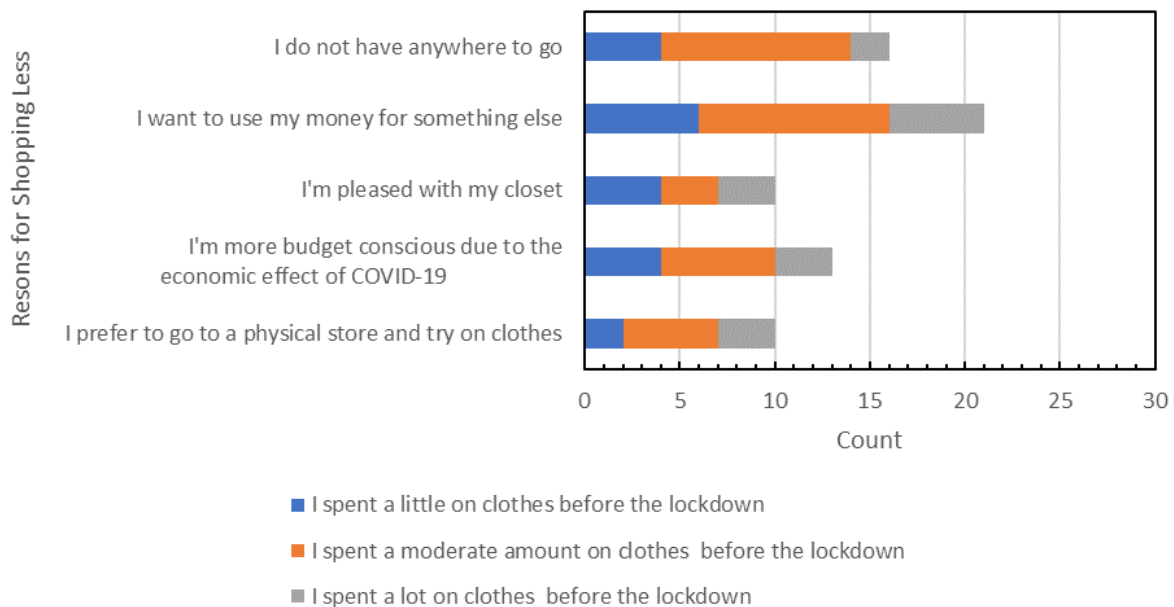
Note. Before the lockdown is before March 2020 (specifically in Fall 2019 semester).

In terms of the pandemic and cost, those who spent the most on clothes were relatively price insensitive. Price was among one of the most important factors when making buying

decisions of those who spent a little, moderate or a lot on clothes prior to the lockdown (Figure 25). For those who said that price is one of the most important factors when buying clothes, they spent little on clothes prior to the lockdown. For those who said they consider price and other factors equally, they spent a lot on clothes before the lockdown. There were no substantial trends between those who solely base their buying decisions on prices and their spending habits on clothing. Those who spent little on clothes before the Pandemic had a majority that said they solely base buying decisions on prices while a second majority said that price is one of their biggest factors when making buying decisions. Those who spent a moderate amount on clothes had a 50:50 split between saying they don't care about price when shopping and 50% who considered price. Those who spent a lot on clothes did not have any significant decisions that were affected by the price.

Figure 25

Spending Habit Before Covid-19 vs. the Importance of Price in a Buying Decision
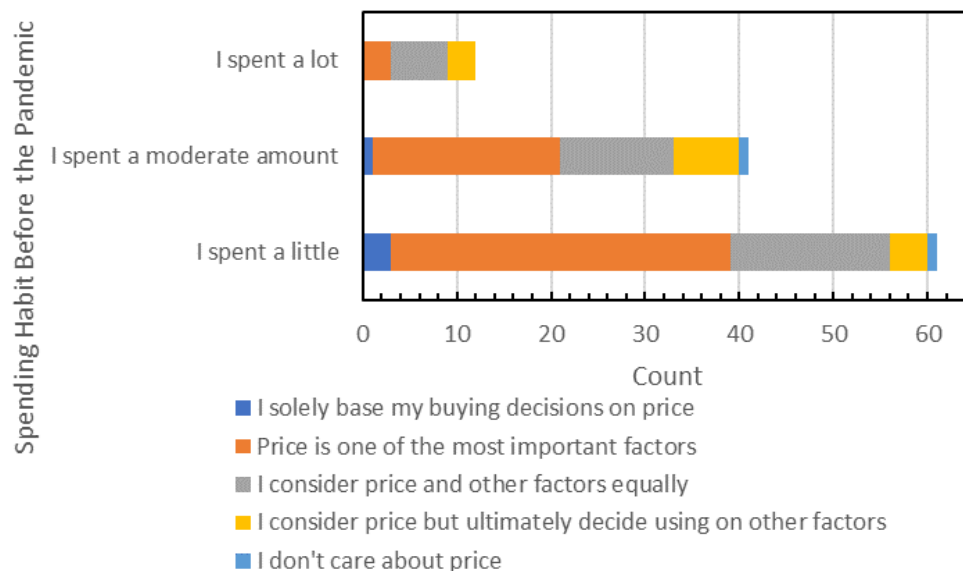
Note. Before the lockdown indicated before March 2020 (specifically in Fall 2019 semester).

Earthfest Survey

A survey was distributed to attendees of the University's Earthfest celebration on April 20, 2022. It consisted of 26 questions and received 62 responses. The survey aimed to find out students' current sustainable habits and knowledge to compare with the results of the Survey of Attitudes and Behaviors. This helped better define whether or not the project had a positive effect on awareness towards sustainability. The population surveyed from the Earthfest survey was very different compared to that of the Survey of Attitudes and Behaviors. Almost 90% of participants were women, and freshmen and seniors made up only 13.3% and 11.7% of the sample. Additionally, 12.3% of respondents were graduate students and there was one postdoc and one middle schooler who answered the survey because it was not limited to undergraduates. Interestingly, a majority of participants were part of the College of Behavioral and Social Sciences (26.3%), followed by the College of Arts and Humanities (19.3%).

The Earthfest survey gauged the accessibility and visibility of the collection bins, collected additional data on college students' attitudes and behaviors in regards to clothing, and determined if the table was educational to students. Given the fact 71.0% of participants had not seen the collection bins on campus, more advertising may have increased the awareness of the bins. Only 24.2% of participants saw the bins, and just 4.8% donated clothing. However, the 25.4% of students who lived in on-campus residence halls were not the only ones to make a contribution. Interestingly, a mix of on-campus, off-campus (32.2% total), and commuters donated clothing. The bins placed at these locations may not have been as visible or accessible to all students. It was also possible that participants saw the bins but did not recall their purpose. Although Earthfest survey respondents had low participation with the bins, almost 740 lbs of clothing was donated. More advertising and awareness of the bins could increase clothing donations and minimize fabric/clothing waste. In addition, this suggested that the average college student, not just the extra environmentally conscious student, valued the sustainability involved with donating clothing.

A majority of participants already engage in sustainable practices in regards to clothing. In the Survey of Attitudes and Behaviors, 30.9% of participants upcycled clothing. In contrast, 69.4% of respondents from the Earthfest survey had upcycled in the past (Table 4). While there is a large difference in the results, participants in the Earthfest survey were more likely to have upcycled on a few occasions; only 1.6% upcycled frequently, while 12.9% and 32.3% did so often or sometimes, and 41.9% rarely upcycled. These terms were not defined, limiting the scope of the

data. Participation in altering clothes and shopping second hand between the two surveys was more similar. This further confirmed that the population surveyed at Earthfest was more likely to be interested in or aware of sustainability practices related to clothing.

Table 4

Comparison of Sustainable Activities Between Surveys

Population	Survey of Attitudes and Behaviors		Earthfest Survey	
Participation	Yes	No	Yes	No
Upcycle	30.9%	69.1%	69.4%	30.6%
Alter	59.7%	38.0%	59.7%	40.3%
Shop Second Hand	72.1%	27.9%	79.0%	16.1%

Note. Some participants did not answer all the questions.

Social media trends inspired 62.9% of participants to upcycle clothing. This indicated that social media had a significant impact on college students, and that it could be used to spread awareness. Launching a social media campaign would likely increase awareness of the collection bins and further encourage students to keep clothes out of landfills. The most popular upcycling method was cutting, followed by dyeing and sewing clothing (Figure 26). Given instruction, 90.2% of participants were open to altering their own clothing. However, 54.2% of participants actually altered clothing themselves while 30.5% had someone else alter it for them (paid or for free, possibly by a family member). Just 11.9% did nothing to a piece that needed alteration. It was unknown if participants continued to wear the garment or not. What was considered to need altering was not defined. The Survey of Attitudes and Behaviors found that time and skill was a concern for those who did not fix/mend clothing; it is likely the same case here. For clothing that was ripped or worn out, participants were slightly more likely to donate the clothing (41.0%) than they were to fix it themselves (39.3%). A smaller proportion threw the garment away (6.6%) or would only wear it indoors or leave it in their closet (3.2%).

Figure 26

Upcycling Methods Employed By Participants
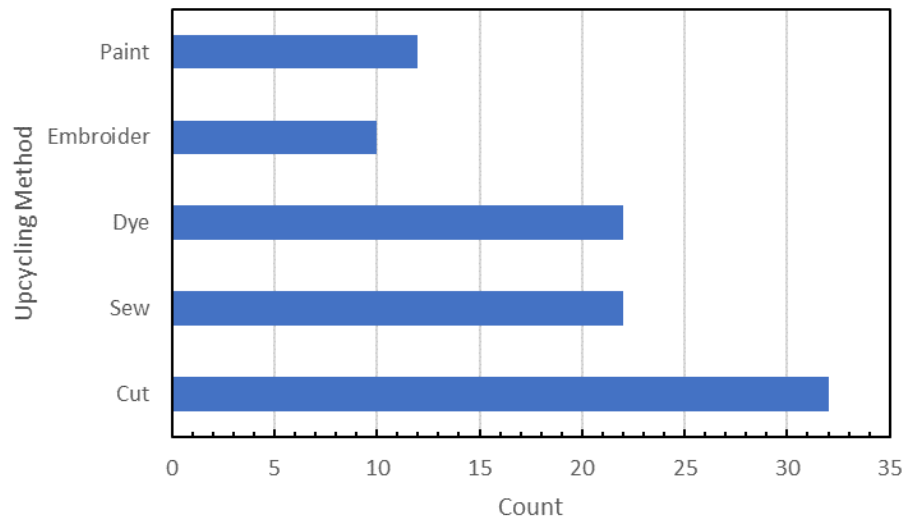
Note. Options were multiple select.

Figure 27

How Participants Donated Clothing
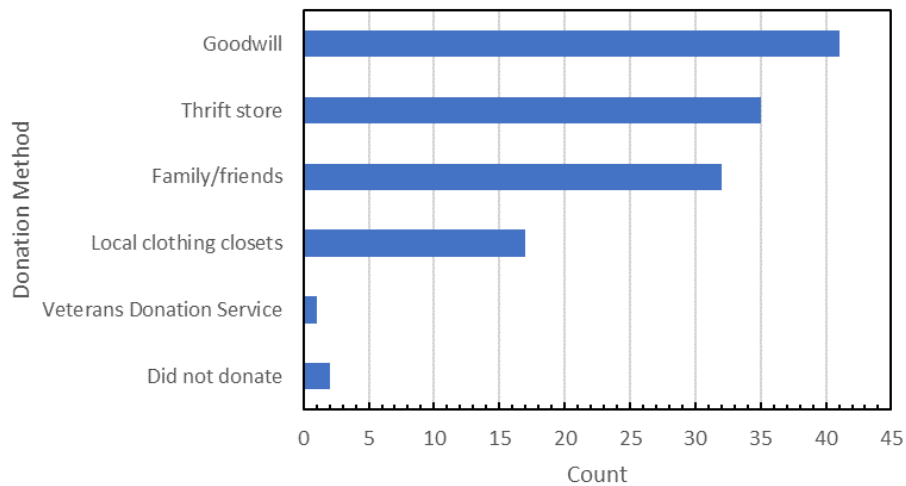
Note. Veterans donation service was a fill in answer.

Participants were most likely to donate clothing to Goodwill, followed by thrift stores then family and friends (Figure 27). Only 3.4% did not donate at all, and 1 respondent donated to Veterans Donation Services to ensure that their clothing would be donated wholly and directly

rather than be resold. Half of participants knew where their donation would go, however this was not explicitly defined. Of participants that bought used or second hand clothing, 100% have purchased from physical thrift/second hand stores, while 32.7% and 28.6% have purchased from online thrift stores in general and Depop specifically (Figure 28).

Figure 28

How Participants Bought Used or Second Hand Clothing

Note. 49 participants bought used/second hand clothing; 100% have bought from physical thrift stores.

A majority of respondents for the Earthfest survey claimed that they learned something about donating clothes, upcycling, or buying second-hand clothes from the table. This contrasted with the previous responses that indicated a majority of participants already donate, upcycle, and buy second-hand clothing. Respondents might have felt obligated to say that they learned something even if they did not. More respondents answered that their attitudes toward donating changed compared to buying second-hand. This suggeste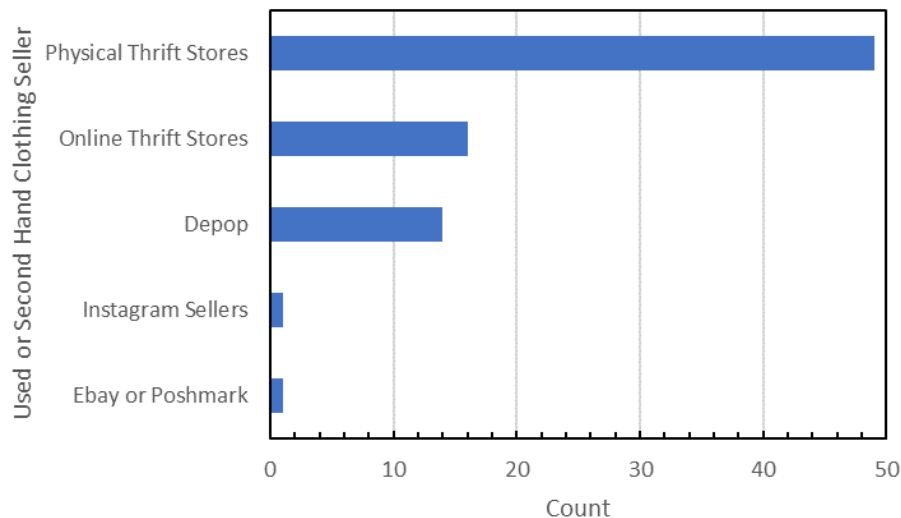d that changing college students' behavior in regards to discarding clothes was easier than changing their attitudes toward buying clothes. However, since we were giving out second-hand clothes for free, some respondents may not have felt that their attitude towards purchasing second-hand changed.

Collection Bin Survey Findings

Collection bin surveys were linked to QR codes on all 25 bins that were distributed to the residence halls and university-owned apartments on October 25th, 2021 (Appendix D). Students who made donations to the collection bins had the option to participate in this survey. Due to the low response rate rate, the survey results were not reportable.

Collection Bins

Collection bins were implemented in 25 residence halls and 2 university-owned apartment buildings to determine the participation and necessity of such a system. At the end of the fall semester, the team collected 32 bags of clothes from dorms and the Clarice Smith Performing Arts Center, totaling 739.8 pounds in one month before winter break (Figure 29). Of this figure, 60.5% (447.6 lbs) were costumes donated by the Clarice and 39.5% (292.2 lbs) were clothing donated by students. The team did not intend to collect from Clarice, but the opportunity came to the team when we learned that they wanted help cleaning out their costume shop. The costume shop held any clothing articles from affiliated productions not sold to students and the community annually at their resale event in September. The donation from Clarice consisted of a mix of pieces that can blend in with everyday clothing and ones that can be described as theatrical. The latter pieces were donated to an involved community member who distributed them to local and high school theater programs.

Figure 29

Clothing Collected from Bins Placed in Residence Halls

Note. Clothes collected from residence halls and Clarice Center for Performing Arts.

Most of the clothing collected included common items like t-shirts, shirts, pants, dresses, and some shoes and accessories. There were unusual items like children's clothing and dolls, given that the clothing was collected from college students. Trash such as food wrappers and receipts were also recovered from the bin. Students may not have realized the bins were for clothing donations. However, the cardboard collection bins were different from typical trash cans in the residence halls in terms of material and shape. Additionally, flyers were posted on the bins and the opening was large enough that if clothes were already donated, they would be visible. It was more likely that students did not care that the bins were for clothing and threw their trash away, or passed by the collection bins without properly looking at them. Of the clothing donated by students, most of the weight came from bottoms (Table 5). This was expected as pants typically weigh more than other types of clothing.

Table 5

Breakdown of Clothing Donated By Students

Clothing Type	T-Shirts, Blouses	Sweaters, Sweatshirts	Dress Clothes	Bottoms
Weight (lbs)	45.3	55.6	59.6	131.7
Weight percent (%)	15.5%	19.0%	20.4%	45.1%

Note. All clothes were sorted prior to weighing.

Table 6

Breakdown of GOY Ratings and Condition Scores of Non-Costume Clothing

Good On You rating	1 - We Avoid	2 - Not Good Enough	3 - It's a Start	No score but Assumed FF	Remaining
Count	26	33	40	49	196
Percent	7.6%	9.6%	11.6%	14.2%	57%
Avg Condition Score	3.9	3.7	3.7	3.8	3.5

Note. Data came from a sample of 344 articles of clothing donated by students.

The team took a sample of 344 articles of clothing donated by students and noted their characteristics (Table 6). Of the sample, 165 unique brands were identified, while 90 items were unknown due to either cut-off or unreadable labels. Only 99 pieces made by 46 brands had a Good On You (GOY) rating and they all fell under We Avoid (1), Not Good Enough (2), and It's a Start

(3) categories. The 99 articles of clothing had an average GOY rating 2.14, while the 46 brands averaged a rating of 1.91. This meant that there were more brands that were considered fast fashion, but more pieces of clothing with a GOY rating of 2 or 3. Although the average condition score increased slightly as GOY rating decreased, the difference was not significant enough to say they were correlated.

The team also used two internal categorizations to further measure the clothes' condition and style. The condition was scored on a scale from 1 (poor) to 5 (new with tags) (Figure 31). See procedures for details on scoring definitions. Over 90% of clothing collected was in good or excellent condition, and no clothing was found in poor condition. There are several possibilities for these results. Of the clothing identified as good or excellent condition, students may not have liked the clothing style anymore and wanted to discard it at that point. Additionally, students may not want to wear their clothing to the point of being in poor condition. Furthermore, it was more likely that they would have thrown away clothes in poor condition rather than holding on to it.

Figure 30

Breakdown of GOY Rating and Condition Score of Sample Clothing
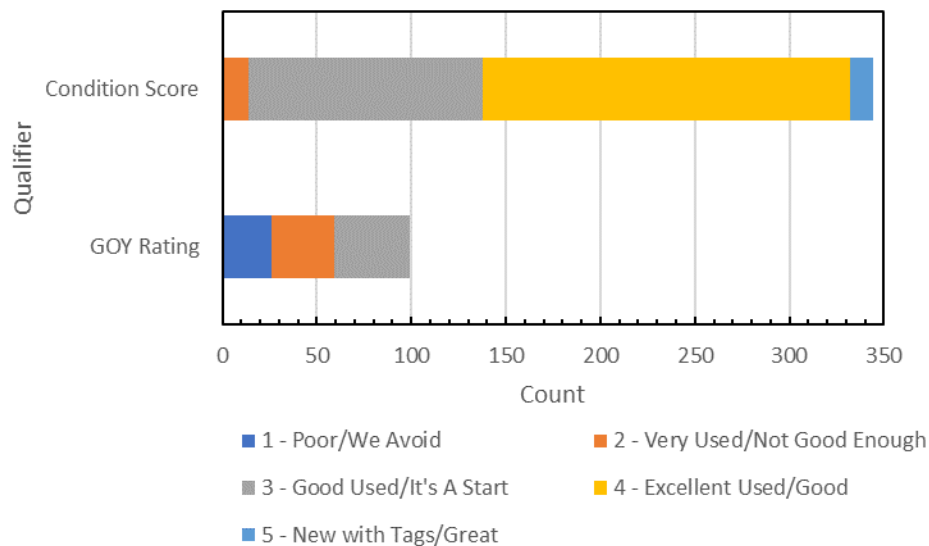
Note. Refer to procedures for definitions of scores for condition and GOY ratings.

Students also donated 3.5% of clothing that was brand new with tags, suggesting that participants bought the clothing but never actually wore it. In fact, 12.1% of participants from the

Survey of Attitudes and Behaviors agreed that they never return clothing they buy online because it was a hassle described them extremely well. The clothing collected also comprised clothing with a GOY rating of 1-3 (We Avoid to It's A Start). This was also expected because clothing in the 4-5 range (Good and Great) come from sustainable brands that are typically more expensive and long lasting. Clothing from these brands may be beyond the budget of an average college student. It is more likely that items from more sustainable brands would be kept longer, whether because of price or quality.

Clothes were also categorized into donation, resale/reuse, and upcycling groups, making up 45.3%, 25.6%, and 29.1% of the sample, respectively. It was often debated which category the pieces belonged to because some fell between the established categories. Nevertheless, all three categories suggested that the donated garments had another "life." In fact, the donation and resale/reuse categories made up almost 75% of the sample, indicating that much of the donations could be worn again as is. This also demonstrated that the garments were discarded due to factors besides quality. There wasn't a noticeable difference between the brands that fell under each category. Many brands fell under the 2 and 3 GOY ratings (Not Good Enough and It's A Start). For example, Shein and H&M fell under both resale/reuse and donation groups while Old Navy and Gildan pieces fell under all ratings 1-3 (We Avoid to It's A Start). Although the resale/reuse category had an average GOY rating of 2.2, the rating for donation and upcycling groups was only marginally smaller, rated at 2.11 and 2.14, respectively. Interestingly, the sorting groups appeared to correlate with the 1-5 condition metric. Clothes for upcycling, donating, and resale/reuse had average condition scores of 3.07, 3.67, and 3.94, respectively. The average condition rating of the 344 sample pieces was 3.59.

The number of clothes that could be worn as-is was surprising. Worn-out fast fashion pieces were expected to be the majority after learning from Joy (2012) that the fast fashion industry designed its goods with frequent purchases to replace low-quality garments. However, that was far from the observation. The sample did not contain any piece that fell under the lowest condition rating and 95.94% of the clothes did not have stains/rips, indicating that they could have been worn again. Over half of the sample was in excellent condition with 12 pieces being new with tags. This made the team wonder why students decided to donate these well-kept pieces and the reasons for the prevalence of throwaway culture among college students. It was also observed that as the GOY score decreased, the average condition of the clothes slightly increased, but not significantly. In

other words, clothing in better condition was more likely to be from a more unsustainable brand. This demonstrated that throwaway culture was likely not due to manufacturers' planned obsolescence by using low-quality material and process, but rather because of consumers' willingness to participate in frequent purchases and short lived fashion trends.

The GOY categorization of the brands into the We Avoid, Not Good Enough, and It's a Start (ratings 1-3) was also a topic of interest. For example, it was surprising to see Shein, H&M, and Zara separated into different categories despite being discussed together as fast fashion brands. Second, brands under the same company were also classified into different GOY categories. Examples include Gap versus Old Navy, with the former receiving a GOY rating of 2 (Not Good Enough) and the latter being 3 (It's A Start). These same ratings were observed between Zara and H&M. This was particularly intriguing because Old Navy, the more affordable brand, had a higher GOY rating than Gap. On the other hand, Calvin Klein and Tommy Hilfiger are both brands under PVH Corp and are categorized as It's a Start. Third, the brand Eddie Bauer was rated a 3 (We Avoid). This was unexpected because the brand claims that sustainability is one of the company's priorities with statements like "Create innovative, versatile, and long-lasting products with the smallest possible environmental footprint" on its website (Eddie Bauer, n.d.). It was interesting that the general perception of a brand's sustainable effort may differ significantly from GOY ratings. On the other hand, GOY justifies its rating by indicating when there is no evidence of the brand minimizing textile waste, greenhouse gas emissions, reading hazardous chemicals when manufacturing its products along with a lack of information and certification regarding its supplier policies and labor standards (Good On You, n.d.).

These examples offered insight to whether a brands' true impact on the world could be determined and the negative impact from a lack of disclosure. GOY uses third-party indices, certifications/accreditation, and the brand's statements to understand attitudes towards the planet, people, and animals to determine ratings (Good On You, n.d.). This brought into question why brands would not disclose their information, especially if they are doing the right thing for the planet and people. The lack of transparency could be a sign of greenwashing. While identifying brand ratings on the GOY website, not all brands were rated. Other unexpected findings included the amount and range of clothing as well as the number of non-mainstream and European brands. Brand names ranged from ones typically seen in malls like Aeropostale and Michael Kors to more niche ones like Amy Byer, Bloom Chic, and Hippie Rose. Such pieces may have come from the

deep corner of a closet or thrifted. Additionally, there were only 6 pieces out of the sample from Shein which far underestimated the team's prediction. However, this aligned with the brand familiarity results from the Survey of Attitudes and Behaviors. Some clothing also came from foreign brands such as Missguided and Pull & Bear. Their presence along with Shein demonstrated the influence technology and media have on consumers' globalized and online consumption.

Conclusion

This research identified college students' attitudes and impressions towards fast fashion and sustainable activities as well as the impact of the Covid-19 pandemic on spending habits. Cost and convenience were the top factors in college students' purchase decisions and familiarity towards new sustainable brands was low. It would be more difficult to push consumers to trade off price for sustainability. However, participants were motivated by factors that decreased the perceived cost of clothing such as discounts and free shipping. Additionally, a lack of time and skill discouraged participants from sustainable habits such as upcycling and mending their own clothes. Nevertheless, they were willing to make changes to behaviors as long as it was convenient. The Earthfest survey collected data from a more environmentally conscientious population. The survey identified social media as a driving factor for upcycling and participants were willing to alter or mend clothing given instruction. Changing behavior related to discarding clothes rather than buying them may be easier. Although these surveys could not change behaviors, they identified attitudes and determined areas where behaviors can be altered. This study also implemented and tested a clothing recycling program for campus communities to develop a blueprint for future replication.

Over 700 pounds of clothing was collected in a one-month period before winter break, indicating the demand for a clothing collection system on campus for students. Implementing collection bins in locations in addition to residence halls would be beneficial to increase reach to off campus students. Providing a convenient channel via clothing collection bins met college students where they were and allowed them to act on their awareness. Combining these factors may encourage sustainable choices regarding clothing purchases. The clothing collection bins also provided data on the success of the system. It required little monetary investment and with additional advertising, is the first step towards a zero-fabric waste community. A detailed blueprint of the collection, sorting, and distribution system was developed for other residential communities to replicate. In the form of a website, the blueprint is distributed to other communities' residential life and sustainability programs via email. It includes specific details about the collection system, marketing materials, and data from this research. Rather than being formed like a case study, the blueprint is presented as a guide on how to create a zero fabric waste community. The blueprint is most applicable to communities mirroring the University of Maryland's campus such as other residential college campuses (as opposed to commuter

campuses), senior living facilities, and residential secondary schools. The concept for this blueprint was modeled after organizations such as Food Recovery Network and Hungry Harvest. While both organizations focus on food waste, many of the concepts can be similarly applied to textile waste. This research will help create a system that can be replicated and implemented across multiple communities.

This research provides an up to date literature review, more recent data on the operation of fast fashion and sustainable fashion companies, analysis of college student's attitudes and behaviors towards clothing as a result of the Covid-19 pandemic, and is the first to test a closed-loop clothing recycling system on a college campus. When conducting this research there were limitations, such as terms that were not clearly defined on the survey, and a lack of time that provided no option to test how attitudes and behaviors changed over time. Though implementing clothing collection bins in high traffic areas of college campuses or other residential communities may help to encourage more sustainable practices, further research on discovering why donors donate and how such behavior can be encouraged to persist is needed due to the limitations of this research.

References

1% for the Planet—Patagonia. (n.d.). Retrieved March 26, 2023, from

https://www.patagonia.com/one-percent-for-the-planet.html

Backs, S., Jahnke, H., Lüpke, L., Stücken, M., & Stummer, C. (2020). Traditional Versus Fast

Fashion Supply Chains in the Apparel Industry: An Agent-Based Simulation Approach.

Annals of Operations Research. https://doi.org/10.1007/s10479-020-03703-8

Beall, A. (2020, July). *Why clothes are so hard to recycle*.

https://www.bbc.com/future/article/20200710-why-clothes-are-so-hard-to-recycle

Biron, B. (2022, September 17). *The rise of Patagonia: How rock climber and activist Yvon

Chouinard created one of the world's biggest outdoor brands from the trunk of his car*.

Business Insider. https://www.businessinsider.com/rise-patagonia-yvon-chouinard-

history-photos-2022-9

Cardigans | Shop Cardigan Sweaters for Women | Forever 21 | Forever 21. (n.d.). Retrieved

March 26, 2023, from

https://www.forever21.com/us/shop/catalog/category/f21/sweater_cardigans

Caro, F., & Martínez-de-Albéniz, V. (2015). *Fast Fashion: Business Model Overview and

Research Opportunities*. https://doi.org/10.1007/978-1-4899-7562-1_9

Chavan, R. (2014). Environmental Sustainability through Textile Recycling. *Journal of Textile

Science & Engineering*, *s2*(01). https://doi.org/10.4172/2165-8064.S2-007

Claudio, L. (2007). Waste Couture: Environmental Impact of the Clothing Industry.

Environmental Health Perspectives, *115*(9), A449–A454.

Crofton, S., & Dopico, L. (2007). Zara-Inditext and the Growth of Fast Fashion. *Essays in

Economic & Business History*, *25*(1), 41–54.

Death, Injury and Health in the Fashion Industry. (2018, May 31). Common Objective.

http://www.commonobjective.co/article/death-injury-and-health-in-the-fashion-industry

Ellen MacArthur Foundation. (2017). *A New Textiles Economy: Redesigning Fashion's Future*.

https://www.ellenmacarthurfoundation.org/assets/downloads/publications/A-New-

Textiles-Economy_Full-Report_Updated_1-12-17.pdf

EPA. (2017, September 7). *Nondurable Goods: Product-Specific Data* [Data and Tools]. US

EPA. https://www.epa.gov/facts-and-figures-about-materials-waste-and-

recycling/nondurable-goods-product-specific-data

Evans, S., Campbell, C., & Naidenko, O. V. (2019). Cumulative risk analysis of carcinogenic

contaminants in United States drinking water. *Heliyon*, *5*(9).

https://doi.org/10.1016/j.heliyon.2019.e02314

Fletcher, K., & Grose, L. (2012). *Fashion & Sustainability: Design for Change*. King.

For Days Company Profile: Valuation & Investors | PitchBook. (n.d.). Retrieved March 26,

2023, from https://pitchbook.com/profiles/company/225263-26

Forced Labor & Human Trafficking Patagonia's approach for remediation. (2012). Patagonia.

https://www.patagonia.com/static/on/demandware.static/-/Library-Sites-

PatagoniaShared/default/dwb48d6b02/PDF-US/human_trafficking_child_labor.pdf

Garcia-Torres, S., Rey-Garcia, M., & Albareda-Vivo, L. (2017). *Effective Disclosure in the Fast-

Fashion Industry: From Sustainability Reporting to Action*.

https://doi.org/10.3390/su9122256

Gelles, D. (2018, May 5). Patagonia v. Trump. *The New York Times*.

https://www.nytimes.com/2018/05/05/business/patagonia-trump-bears-ears.html

Gordon, R., Carrigan, M., & Hastings, G. (2011). A Framework for Sustainable Marketing.

Marketing Theory, *11*(2), 143–163. https://doi.org/10.1177/1470593111403218

Hanbury, M. (2021, October). *How China's most mysterious billion-dollar company, Shein, won over US teens and became TikTok's most-hyped fashion brand*. Business Insider. https://www.businessinsider.com/shein-china-billion-dollar-company-fast-fashion-brand-2021-8

Harris, F., Roby, H., & Dibb, S. (2016). *Sustainable Clothing: Challenges, Barriers and Interventions for Encouraging More Sustainable Consumer Behaviour*. https://doi.org/10.1111/ijcs.12257

Harris, K. (2020, November 20). *Forty Fears of Falling Manufacturing Employment*. U.S. Bureau of Labor Statistics. https://www.bls.gov/opub/btn/volume-9/forty-years-of-falling-manufacturing-employment.htm

Hendelmann, V. (2022, March 10). *Dissecting The Shein Business Model: How Does The Firm Make Money?* https://productmint.com/shein-business-model-how-does-shein-make-money/

Hensel, A. (2015, June 3). *What Patagonia Did When It Found Human Slaves in Its Supply Chain*. Inc.Com. https://www.inc.com/anna-hensel/patagonia-pledges-to-implement-higher-standards-in-factories.html

H&M. (n.d.). *H&M | Online Fashion, Homeware & Kids Clothes | H&M US*. H&M. Retrieved October 6, 2020, from https://www2.hm.com/en_us/index.html

H&M. (2017). *Annual Report: New Goals for a Sustainable Future* (Sustainable Development, pp. 40–45). https://about.hm.com/content/dam/hmgroup/groupsite/documents/en/Digital%20Annual%20Report/2017/Annual%20Report%202017%20Sustainable%20development.pdf

H&M. (2019). *On the way towards using 100% sustainable materials*.

https://about.hm.com/news/general-news-2019/on-the-way-towards-using-100--

sustainable-materials.html

Hoffman, A. (2018). *The Next Phase of Business Sustainability (SSIR)*.

https://ssir.org/articles/entry/the_next_phase_of_business_sustainability

Horton, K. (2018). *Just Use What You Have: Ethical Fashion Discourse and the Feminisation of

Responsibility.* https://doi.org/10.1080/08164649.2019.1567255

Hoskins, T. E. (2014). *Stitched Up: The Anti-Capitalist Book of Fashion*. Pluto Press; JSTOR.

https://doi.org/10.2307/j.ctt183p0z0

Institution Data Dashboard for University of Maryland, College Park- USM IRIS. (2021).

https://www.usmd.edu/IRIS/?view=UMCP

Jackson, S. (2022, October). *Shein factory employees are working 18-hour days for pennies per

garment and washing their hair on lunch breaks because they have so little time off, new

report finds*. Business Insider. https://www.businessinsider.com/shein-factory-workers-

18-hour-shifts-paid-low-wages-report-2022-10

Joy, A., Sherry Jr, J., Venkatesh, A., Wang, J., & Chan, R. (2012). Fast Fashion, Sustainability,

and the Ethical Appeal of Luxury Brands. *E Journal of Dress, Body & Culture,*.

https://doi.org/10.2752/175174112X13340749707123.

Jung, S., & Jin, B. (2014). A Theoretical Investigation of Slow Fashion: Sustainable Future of

the Apparel Industry. *International Journal of Consumer Studies*, *38*(5), 510–519.

https://doi.org/10.1111/ijcs.12127

Kunz, A., Peralta-Zamora, P., Moraes, S. G. de, & Durán, N. (2002). Novas Tendências No

Tratamento de Efluentes Têxteis. *Química Nova*, *25*(1), 78–82.

https://doi.org/10.1590/S0100-40422002000100014

Kyungeun, S. (2015, April 13). *A review on upcycling: Current body of literature, knowledge gaps and a way forward*. https://dora.dmu.ac.uk/handle/2086/14640

LeBlanc, R. (2019, November 4). *Textile and Garment Recycling Facts and Figures*. The Balance: Small Business. https://www.thebalancesmb.com/textile-recycling-facts-and-figures-2878122

Lundblad, L., & Davies, I. A. (2015). The Values and Motivations Behind Sustainable Fashion Consumption. *Journal of Consumer Behaviour*, *15*(2), 149–162. https://doi.org/10.1002/cb.1559

Luongo, G., Thorsén, G., & Östman, C. (2014). Quinolines in Clothing Textiles—A Source of Human Exposure and Wastewater Pollution? *Analytical and Bioanalytical Chemistry*, *406*(12), 2747–2756. https://doi.org/10.1007/s00216-014-7688-9

Macy's. (n.d.). *Champion Men's Cotton Jersey T-Shirt & Reviews—T-Shirts—Men—Macy's*. Macys. Retrieved December 4, 2020, from https://www.macys.com/shop/product/champion-mens-cotton-jersey-t-shirt?ID=4339197&cm_mmc=Facebook-_-pdpshare-_-n-_-n

Niinimäki, K. (2012). *Proactive Fashion Design for Sustainable Consumption*. 60–69.

Notman, N. (2020, January 27). *Recycling Clothing the Chemical Way*. Chemistry World. https://www.chemistryworld.com/features/recycling-clothing-the-chemical-way/4010988.article

Oliveira, D. P., Carneiro, P. A., Sakagami, M. K., Zanoni, M. V. B., & Umbuzeiro, G. A. (2007). Chemical Characterization of a Dye Processing Plant Effluent—Identification of the Mutagenic Components. *Mutation Research/Genetic Toxicology and Environmental*

Mutagenesis, *626*(1–2), 135–142. https://doi.org/10.1016/j.mrgentox.2006.09.008

Ozdamar Ertekin, Z., & Atik, D. (2014). Sustainable Markets: Motivating Factors, Barriers, and

Remedies for Mobilization of Slow Fashion. *Journal of Macromarketing*, *35*(1), 53–69.

https://doi.org/10.1177/0276146714535932

Park, S. H., & Kim, S. H. (2014). Poly (Ethylene Terephthalate) Recycling for High Value

Added Textiles. *Fashion and Textiles*, *1*(1), 1. https://doi.org/10.1186/s40691-014-0001-

x

Patagonia. (2021). *Our Footprint*. https://www.patagonia.com/our-footprint/

Patagonia, Inc. (2023). In *Wikipedia*.

https://en.wikipedia.org/w/index.php?title=Patagonia,_Inc.&oldid=1140610462

Pauly, A. (2022, April 18). *TikTok's "Zara vs. SHEIN" Obsession Shows Just How Soulless Fast*

Fashion Is. Highsnobiety. https://www.highsnobiety.com/p/zara-vs-shein-dupes-tiktok-

instagram/

Peleg Mizrachi, M., & Tal, A. (2022). Sustainable Fashion—Rationale and Policies.

Encyclopedia, *2*(2), Article 2. https://doi.org/10.3390/encyclopedia2020077

Rani, S. P., & Jamal, Z. (2018). Recycling of textiles waste for environmental protection.

International Journal of Home Science, *4*(1), 164–168.

Reebok. (2021). *Reebok Sustainability – What We're Made of Matters*.

https://www.reebok.com/us/sustainability_home

Reformation—Yael Aflalo. (n.d.). Retrieved March 26, 2023, from

https://www.thereformation.com/yael-aflalo.html

Residence Halls. (n.d.). Department of Resident Life | University of Maryland. Retrieved March

22, 2023, from https://reslife.umd.edu/terp-housing/residence-halls |

https://reslife.umd.edu/

Sandin, G., & Peters, G. M. (2018). Environmental impact of textile reuse and recycling – A

review. *Journal of Cleaner Production*, *184*, 353–365.

https://doi.org/10.1016/j.jclepro.2018.02.266

Segran, E. (2019, March 2). *Your H&M Addiction Is Wreaking Havoc on the Environment.*

Here's How to Break It. Fast Company. https://www.fastcompany.com/90311509/we-

have-to-fix-fashion-if-we-want-to-survive-the-next-century

Shen, D., Richards, J., & Liu, F. (2013). Consumers' Awareness of Sustainable Fashion.

Marketing Management Journal, *23*(2), 134–147.

Shirvanimoghaddam, K., Motamed, B., Ramakrishna, S., & Naebe, M. (2020). Death by Waste:

Fashion and Textile Circular Economy Case. *Science of The Total Environment*, *137317*.

https://doi.org/10.1016/j.scitotenv.2020.137317

Singer, R. (2011). *Sew Eco: Sewing Sustainable and Re-Used Materials*. A&C Black.

Stokes, D. (2021, December 2). *Nike, Patagonia named in new European criminal filing for*

"crimes against humanity" in China. Nationalpost.

https://nationalpost.com/news/world/nike-patagonia-named-in-new-european-criminal-

filing-for-crimes-against-humanity-in-china

Strähle, J., & Müller, V. (2017). Key Aspects of Sustainability in Fashion Retail. In J. Strähle

(Ed.), *Green Fashion Retail* (pp. 7–26). Springer. https://doi.org/10.1007/978-981-10-

2440-5_2

Testa, J., Friedman, V., & Paton, E. (2020, July 26). Everlane's Promise of 'Radical

Transparency' Unravels. *The New York Times*.

https://www.nytimes.com/2020/07/26/fashion/everlane-employees-ethical-clothing.html

The price of fast fashion. (2018). *Nature Climate Change*, *8*(1), Article 1.

https://doi.org/10.1038/s41558-017-0058-9

Thomas, D. (2018, April 24). Why Won't We Learn from the Survivors of the Rana Plaza

Disaster? *The New York Times*. https://www.nytimes.com/2018/04/24/style/survivors-of-

rana-plaza-disaster.html

Thomas, D. (2019). *Fashionopolis: The Price of Fast Fashion and the Future of Clothes*.

Penguin Press.

Thorisdottir, T. S., & Johannsdottir, L. (2019). Sustainability Within Fashion Business Models:

A Systematic Literature Review. *Sustainability*, *11*(8), 2233.

https://doi.org/10.3390/su11082233

U. S. Government Accountability Office. (1994). *Garment Industry: Efforts to Address the*

Prevalence and Conditions of Sweatshops. *HEHS-95-29*.

https://www.gao.gov/products/HEHS-95-29

US EPA, O. (2013, April 16). *Recycling Basics* [Overviews and Factsheets]. US EPA.

https://www.epa.gov/recycle/recycling-basics

US EPA, O. (2022, December). *Textiles: Material-Specific Data* [Collections and Lists].

https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/textiles-

material-specific-data

Vara, V. (2022, May). Fast, Cheap, and Out of Control: Inside Shein's Sudden Rise. *Wired*.

https://www.wired.com/story/fast-cheap-out-of-control-inside-rise-of-shein/

Varanasi, K. V., Lakshmi. (2022, September 14). *Patagonia founder is giving away his billion*

dollar company and ensuring that all profits go towards fighting climate change.

Business Insider. https://www.businessinsider.com/patagonia-founder-gives-away-

company-profits-to-go-climate-crisis-2022-9

Womens Cropped Cardigan Sweaters—Macy's. (n.d.). Macys. Retrieved March 26, 2023, from

https://www.macys.com/shop/featured/womens%20cropped%20cardigan%20sweaters

World Bank. (2019). *How Much Do Our Wardrobes Cost to the Environment?* World Bank.

https://www.worldbank.org/en/news/feature/2019/09/23/costo-moda-medio-ambiente

Worn Wear—Better Than New. (n.d.). Retrieved March 26, 2023, from

https://wornwear.patagonia.com

Yip, W. (2022, April). *Controversial Chinese fast fashion company Shein is now worth more*

than Zara and H&M combined after its recent $100 billion valuation: Report. Insider.

https://www.insider.com/shein-100-billion-value-worth-more-zara-and-hm-combined-

2022-4

Appendix A: Glossary

- **Attitude-behavior gap**: the space that occurs when one's values (attitudes) do not correlate to their actions.
- **Azo synthetic dyes** - Synthetic dyes used in textile, cosmetic, food, etc. industries and when systematically metabolized/absorbed can be hazardous to liver cells and skin bacteria.
- **Contract manufacturing**: companies enter an arrangement with other contracted manufacturers, often in foreign countries, to produce components of an output.
- **Corporate social responsibility:** a corporation' s practice or policy that aims to have a positive influence on the world
- **Dyeing**: fixing color onto textiles and usually requires large amounts of water and various chemicals (mainly salts) to help the textile absorb the dye.
- **Effluent**: waste water discarded into a body of water.
- **Elkington's triple bottom line**: a framework that encourages the assessment of overall business performance based on profit, people, and planet.
- **Fast fashion**: fashion designs that rapidly move from the catwalk where they first appear to retail stores.
- **Finishing treatments**: last step to obtain special properties on the garment.
- **Global scanning**: systematically seeking out the most profitable locations for production.
- **Linear business model**: business that takes components, creates finished products or services, and sells that good or service to consumers.
- **Mercerizing:** improves the ability to dye, luster, and overall appearance of the textile. It involves treating the textile with a concentrated alkaline solution then washing with an acid solution.
- **PET:** polyethylene terephthalate, a plastic polymer made from petroleum.
- **Polyester**: a synthetic fabric or textile made from petroleum.
- **Slow fashion**: first coined by Fletcher (2007); acts as the antithesis of fast fashion, moving beyond sustainability efforts within the fast fashion business model to creating an entirely new, sustainability-focused business model.

- **Sustainability:** making best use of the resources available and practicing mindful consumption of goods and services so that all basic needs and quality of life are met without jeopardizing the needs of future generations (Gordon et al., 2011).

- **Sweatshop**: an employer that violates more than one federal or state labor law governing minimum wage and overtime child labor, industrial homework, occupational safety and health, workers' compensation, or industry regulations (U. S. Government Accountability Office, 1994).

- **Upcycling**: creative reuse/transformation of a product that was considered waste into a valued product.

Appendix B: Budget

Collection Bins	$90
Survey Compensation	$40
Storage	$1290
Printing	$42.50
Earthfest Supplies	$75.22
Total	$1,537.72

Appendix C: Timeline

Spring 2021:

- Complete, finalize and defend thesis proposal.

- Develop budget, obtain IRB approval and CITI training.

- Develop a plan for data collection in the Fall 2021.

- Start developing and doing test runs for surveys.

- Identify and contact field experts and continue to reach out to businesses/nonprofits in order to start forming potential partnerships.

Fall 2021:

- Distribute Survey of Attitudes and Behaviors and begin to analyze responses.

- Implement and collect data from collection bins.

- Participate in the Earthfest sustainability event, give away donated clothes, and conduct upcycling demonstrations.

- Develop final outline for thesis.

- Begin thinking about publications.

- Present preliminary research at the Gemstone Do Good Showcase.

Spring 2022:

- Continue survey data collection and analysis.

- Begin thesis draft and blueprint.

- Present at Undergraduate Research Day.

- Sort clothing and textiles.

- Begin distribution of clothing and textiles

Fall 2022:

- Distribute clothing and textiles.

- Finish data analysis.

- Find and invite experts for the Thesis Conference.

- Continue blueprint.

- Revise thesis draft for Thesis Conference.

Spring 2023:

- Finish blueprint.

- Finish website.

- Submit thesis draft.
- Present and defend research at Thesis Conference.
- Submit final thesis.
- Citation ceremony.

Appendix D: Residence Halls

Cambridge Community

- Bel Air
- Cambridge
- Centreville
- Chestertown
- Cumberland

Denton Community

- Denton
- Easton
- Elkton
- Oakland

Ellicott Community

- Ellicott
- Hagerstown
- La Plata

North Hill Community

- Anne Arundel
- Caroline
- Carrol
- Dorchester
- Prince Frederick
- Queen Anne's
- St. Mary's
- Somerset
- Wicomico
- Worcester

South Hill

- South Hill Community Office (Calvert Hall)
- Annapolis
- Harford

University Affiliated Apartments

- South Campus Commons
- The Courtyards

Appendix E: Survey Questions and Responses

Survey of Attitudes and Behavior

Responses

Appendix F: IRB Documents for Survey of Attitudes and Behaviors

Anonymous Email Collection for Raffle

Consent Waiver for Survey of Attitudes and Behaviors

Email Script to Recruit Participants for Survey

Social Media Script to Recruit Participants for Survey V.2

Survey Reminder (email and social media) V.2

Appendix G: IRB Documents for Collection Bins

Collection Bin Design and Graphics/Flyers

Collection Bin Email/Social Media Advertising V.2

Collection Bin Instagram Graphics

Collection Bin Survey V.5

Consent Waiver for Bin Survey

Email for Collection Bin Permission in Courtyards/Commons V.1

Email for Collection Bin Permission in Residence Halls V.1

Picture of Collection Bin

Appendix H: IRB Documents for Earthfest Survey

Advertising for Sustainability Event V.2

Informed Consent for Interviews V.2

Interview Protocol at Events V.2

Interview Recruitment Script

Appendix I: Zero-Fabric Waste Campus Blueprint

[Blueprint Website](#)