

Analyzing Textile Consumption Data in Correlation to Income Demographics Data

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Abstract

The purpose of this project was to determine the correlation between consumption data and income demographics data and analyze how the data relates to an individual's sustainability, which makes income the main factor of the research. The growing issue of textile waste has made its mark on the world through its contribution in rising pollution levels, this project is focused on understanding the implication income has on an individual's sustainability and the negative aspects of "fast-fashion" on spending habits.

Previous research has not considered the rise of "fast-fashion" which has caused textile waste to rise, additionally, the connection between "fast-fashion" and income was not addressed. Through this research, sustainability was compared to consumer and intent and household income which considers the growing rise in people, especially young adults, and minors, purchasing clothing from unsustainable clothing brands in hopes of finding trends in the data that could combat against unsustainable clothing brands and help people find alternatives to the cheap clothing.

The research was conducted through an online survey that thirty participants took, answering questions about household income, clothing consumption, views on sustainability, and if it affects their consumer intent and general consumption. The goal of the research was to address and educate people on the growing problem of unsustainable textile waste and the negative

impacts it has on the planet, as well as the poor conditions of workers and the locations of unused discarded clothing, hoping that people understand the severity of unsustainable textile and consider sustainability while purchasing clothing.

Research Question

How do sustainability beliefs affect consumption?

How does household income affect consumption?

Independent Variable

I.D a.) The initial independent variable is the sustainability score (of a surveyor). The sustainability score is calculated through averaging a surveyor's answers to survey question #7, this is done by assigning each answer option a number, “Strongly Disagree” being 1, “Strongly Agree” being 5. The higher score a surveyor gets on this portion, the higher they value sustainability.

I.D b.) The second independent variable being measured is disposable income. This is being measured through survey question #1. The surveyors answer to question #1 is then graphed on the x axis in comparison to their consumer score.

Dependent Variable

D. a.) The initial dependent variable is the consumer score (of a surveyor). The surveyors average consumer score is calculated using questions 2-5, for each question answer “A” is valued at 1, while answer “E” is valued at 5. A high score reflects high consumption habits while a low score reflects minimal and conscious consumption. This will be compared against a surveyor's sustainability score.

D. b.) The second dependent variable is also the consumer score (of a surveyor). The surveyors average consumer score is calculated using questions 2-5, for each question answer “A” is valued at 1, while answer “E” is valued at 5. A high score reflects high consumption habits while a low score reflects minimal and conscious consumption. However in this data comparison, the consumer score will be compared to a surveyor's disposable income.

Hypothesis

Hypothesis 1. Consumers whom reflect a greater sustainability score will then also express a lower consumer score. And those consumers that show a low sustainability score, will also

express a high consumer score. As a sustainable mindset in a consumer makes for sustainable purchases.

Hypothesis 2. Surveyors whom have less disposable income will reflect that in a lower consumer score. And those surveyors with more disposable income will have a correlating higher consumer score. This is because income demographics play a role in a person's consumption habits.

Introduction/Rationale

Globally 13 million tons of textile waste is produced each year, and 95% of it could be reused or recycled. This breaks down to 70 pounds of waste per the average consumer per year. (“The Pretty Planteer”) Not only does this pollute landfills but the fashion industry is responsible for 20% of the world's water waste. Additionally 10% of global greenhouse gas emissions are produced by clothing and footwear production. This is more than that of all international flights and maritime shipping combined. (European Parliament) Textile waste is one of the all-around largest contributors to environmental issues. Specifically in terms of textile waste, mostly from discarded clothing but also footwear, and other linen goods. Textile waste proves to be an incredibly important problem to the health of the environmental future. With the shortening trend cycle, textile waste has only increased. According to an article by the WRAP, “The volume of clothing Americans throw away each year has doubled from 7 million to 14 million tons in under 20 years. In under 15 years, clothing production doubled as well, with the average consumer buying 60 percent more clothing pieces. Each piece is now kept half as long.” (Nelson) With accredited ties to social media culture and the faster communication of the 21st century, textile waste has become far more than an issue of overconsumption but also a issue of environmental threat.

The recent uptick in textile waste is due in large part to the upheave in textile production. Faster communication through modern day social media has made for shorter fashion trend cycles, giving once trendy clothing items a shorter lifespan. In 2019 alone, 208 million pounds of clothing waste was attributed to single-use outfits (Nelson). With trend cycles lasting as little as a few months. Meaning that every few months, consumers feel the need to throw out their now tacky clothes in exchange for a glamorous new trendy piece. Brand initiatives for this issue involve taking green initiative in the production of their clothes and responsible disposal for their waste. A survey titled “The Empirical Analysis of Green Innovation for Fashion Brands, Perceived Value and Green Purchase Intention—Mediating and Moderating Effects”, concluded that consumers are more likely to take a brand's green innovation into account when purchasing. And also that green advertisement is also a positive factor in consumer purchasing (Chen, L.; Qie, K.; Memon, H.; Yesuf, H.M.).

Additionally, the 13 million tons of waste that the fashion industry produces results in extreme negative environmental impacts. Currently, the fashion industry alone is responsible for more annual carbon emissions than all international flights and maritime shipping combined which is expected to have a 50% increase in greenhouse gas emissions within the next decade. (Le) Fast fashion factories have moved to countries without strict environmental regulations, allowing companies to partake in non-environmentally friendly practices without consequences that affect the company. This leads to untreated water entering the ocean, with textile dyeing being the second largest polluter of water globally. The wastewater is especially toxic and is, in many cases, irreversible. Due to the amount of clothing consumed in the recent decades, these lower quality clothes are ending up in landfills. Excessive amounts of resources are being wasted to be used as materials for clothing production and 57% of that discarded clothing arrives at a landfill. Landfill has many dangers that affect the environment and nearby communities that are in vicinity of toxic substances.

Today, consumers are interested in purchasing clothing pieces for a cheaper price rather than focusing on quality, fitting their interests in clothes to the latest fashion trends. It is reported that fast fashion brands are producing one “collection” a week. For fast fashion brands, it has been established to have a large stock of clothes at all times. Fast Company says, “apparel companies make 53 million tons of clothes into the world annually. If the industry keeps up its exponential pace of growth, it is expected to reach 160 million tons by 2050.” (Stanton) The inexpensive clothing is appealing to consumers leading to overproduction and consumption which in turn has violated environmental and human regulations. Despite the low prices, brands are making millions of dollars from the amount being sold while the environment is being affected and workers are being paid less than minimum wage.

Sustainable business initiatives benefits not only the environment but also the economy. Sustainable initiatives have many economic benefits such as creating new jobs. By finding alternatives for the most common fabrics cotton and polyester, like organic or low leveled chemical cotton, flax, hemp, and lyocell there is a lot less money wasted on water and pesticide usage. Much of the clothing bought today is fast fashion which creates more waste, causing negative environmental effects. In the fast fashion industry, many burnt textiles aren't even sold which creates lots of fabric waste. Although fast fashion is cheaper it is also “designed to last only a short amount of time”(Fleecher) which over time ends up costing more. “In addition to many fast fashion brands having poor labor conditions and low pay for vulnerable workers, “It takes 713 gallons of water to make ONE cotton t-shirt, the equivalent to 2.5 years of drinking water for an individual.”(Jordan) If there was more sustainability in the fashion industry many people could get better jobs as well as having more resources for families and people in need.

Procedure/Risk

1. Using “Microsoft Forms”, a survey was created that collected demographic data (age and gender) and had five Likert scales which then asked the participant to give their answer to topics around textile consumption, textile spending, and environmental effects attributed to the textile industry.
2. Participants were given a consent form with the information of the risks, benefits, and purpose associated with participating in the survey. Each participant was informed that the participation was voluntary, and they had the right to stop at any time in the form. The survey answers were completely anonymous.
3. Participants were asked to take an approximate two minute “Sustainability in Consumer Internet Survey”.
4. The survey was as follows:
https://forms.office.com/Pages/ResponsePage.aspx?id=4FBwvMxLCUiSReqLZQhIZfET9K_nlcVBq5-ogu-DW_FUMDIZNzJVou8xUkIJTE45RDY1SVVXSThRNy4u
5. Participants' results for each question were inputted into a table. The results were then averaged into a “consumer score” based on questions 2-5 pertaining to spending and consumption habits, and their “sustainability score” based on the Likert Scale statements for question 6.
6. Information from the table was inputted into graphs, one graph compared participants sustainability scores (x-axis) to consumer scores (y-axis), and the second graph compared disposable income (x-axis) to consumer scores (y-axis).
7. Data was analyzed through the connection and comparison of consumer scores, sustainability scores, and disposable income which was used to prove or disprove out hypotheses.

Safety/Data Analysis

- A. **Participants:** Participants of all ages, genders, and races/ethnicities.
- B. **Recruitment:** Participants were found on campus and were given the consent form before deciding to participate or not. Participants were then invited to take the survey during any free time they had available.
- C. **Methods:** Participants will be asked to take a two-minute survey regarding sustainability in consumer intent.
- D. **Risk Assessment:** There is low to no risk in taking the survey. The approximate time to take the survey is two minutes in which the participant is free to stop participating at any time.
- E. **Protection of Privacy:** All data will be confidential and anonymous through Microsoft Forms where specific settings will be in place to guarantee anonymity, and all questions will be optional. The data will be stored within Microsoft Forms and original tables and graphs which can only be accessed by the surveyors. After the study, the Microsoft Forms

survey will be deleted, and personal copies of information will be safely stored without outside access.

F. **Informed consent process:** All participants will be informed through a written consent form of the purpose, risks, benefits, and that their participation is completely voluntary with the right to stop and/or not answer questions in the survey at any time. All participants signed the consent form before taking the survey.

Risks

A possible risk for this survey is eye strain.

Safety

Participants will be given any time needed to complete the survey with the right to have breaks and/or reschedule the taking of the survey.

Materials List

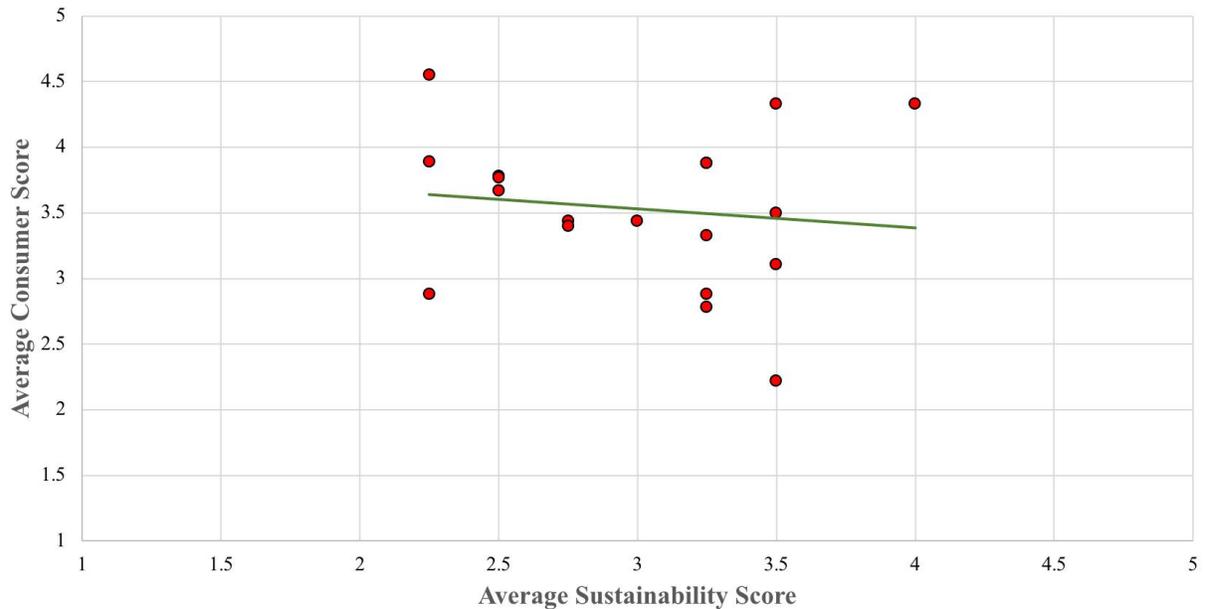
A survey link will be sent to every participant; a computer will be provided for participants to take the survey if needed

Data Analysis

Average Consumer Score vs. Average Sustainability Score

Surveyor	Consumer Question Answers					Average Consumer Score	Sustainability Likert Scale Answers									Average Sustainability Score
	Question 2	Question 3	Question 4	Question 5	6.A		6.B	6.C	6.D	6.E	6.F	6.G	6.H	6.I		
1	2	3	3	2	2.5	3	4	5	3	3	4	2	4	4	3.56	
2	4	4	4	4	4	4	4	5	4	3	4	5	5	5	4.33	
3	3	2	2	2	2.25	4	4	4	4	3	3	5	4	4	3.89	
4	3	4	4	2	3.25	3	1	4	2	2	3	2	4	4	2.78	
5	3	2	2	3	2.5	4	4	4	3	3	4	3	4	4	3.67	
6	3	4	4	2	3.25	3	3	3	3	3	2	2	3	4	2.88	
7	3	4	4	3	3.5	5	5	5	4	3	4	3	5	5	4.33	
8	3	2	2	3	2.5	4	5	4	4	3	3	4	3	4	3.78	
9	3	4	4	3	3.5	3	2	5	2	3	4	3	3	3	3.11	
10	2	2	2	3	2.25	4	3	4	2	2	3	2	4	2	2.88	
11	3	2	2	3	2.5	4	4	5	4	2	4	4	4	3	3.77	
12	3	4	3	3	3.25	4	4	5	4	4	4	4	3	3	3.88	
13	3	4	4	2	3.25	5	4	4	3	3	4	4	4	4	3.88	
14	3	4	4	3	3.25	3	2	4	3	3	3	4	4	4	3.33	
15	3	2	2	4	2.75	3	4	4	2	2	5	3	4	4	3.44	
16	3	2	2	2	2.25	5	4	5	5	3	4	5	5	5	4.55	
17	2	4	4	2	3	4	4	5	2	3	3	2	4	4	3.44	
18	3	2	2	4	2.75	5	4	5	3	3	3	3	4	4	3.4	
19	3	4	4	3	3.5	1	4	4	1	1	1	1	3	4	2.22	
20	3	4	4	3	3.5	3	4	4	4	3	5	1	4	4	3.5	

Average Consumer Score vs. Average Sustainability Score



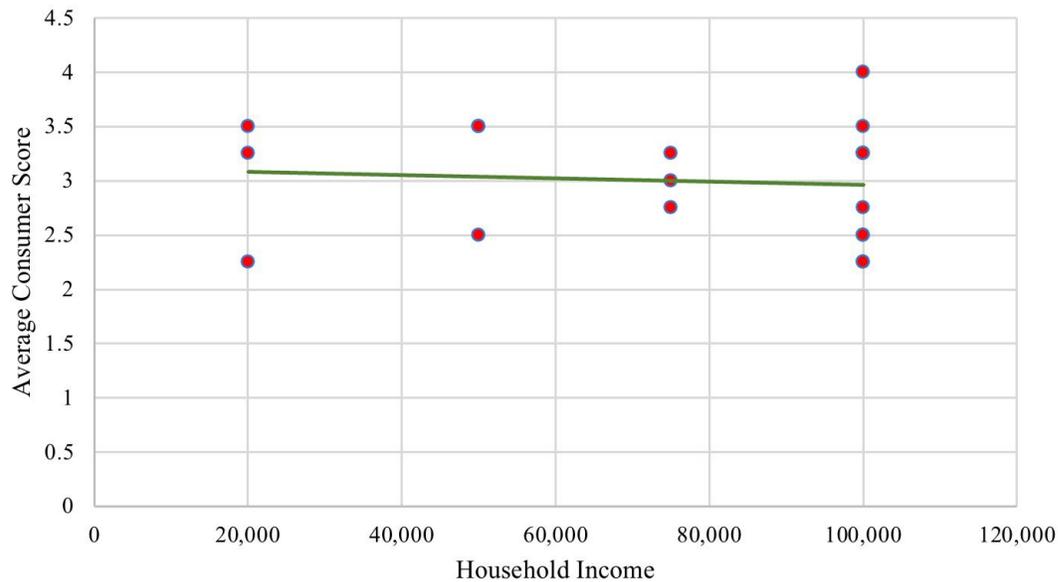
Each dot represents one surveyor's place on the Average Consumerism vs. Average Sustainability Score graph. There is no seeming correlation between surveyor's consumer and sustainability scores. However, most survey takers average a 3 on the sustainability scale and a 3.5 on the consumerism scale.

A higher consumer score demonstrates the tendency to buy clothing in large quantities, frequently and bought new. Whereas a low consumer score represents less frequent, less quantity and thrifted or secondhand clothing sourcing. And on the sustainability scale a higher score indicates a high level of care and mindfulness as to how clothing is produced. A lower sustainability score represents a lack of caring for the way clothing is produced sourced and bought.

Average Consumer Score vs Household Income Bracket

Surveyor	Consumer Question Answers					Sustainability Likert Scale Answers									
	Question 2	Question 3	Question 4	Question 5	Average Consumer Score	6.A	6.B	6.C	6.D	6.E	6.F	6.G	6.H	6.I	Average Sustainability Score
1	2	3	3	2	2.5	3	4	5	3	3	4	2	4	4	3.56
2	4	4	4	4	4	4	4	5	4	3	4	5	5	5	4.33
3	3	2	2	2	2.25	4	4	4	4	3	3	5	4	4	3.89
4	3	4	4	2	3.25	3	1	4	2	2	3	2	4	4	2.78
5	3	2	2	3	2.5	4	4	4	3	3	4	3	4	4	3.67
6	3	4	4	2	3.25	3	3	3	3	3	2	2	3	4	2.88
7	3	4	4	3	3.5	5	5	5	4	3	4	3	5	5	4.33
8	3	2	2	3	2.5	4	5	4	4	3	3	4	3	4	3.78
9	3	4	4	3	3.5	3	2	5	2	3	4	3	3	3	3.11
10	2	2	2	3	2.25	4	3	4	2	2	3	2	4	2	2.88
11	3	2	2	3	2.5	4	4	5	4	2	4	4	4	3	3.77
12	3	4	3	3	3.25	4	4	5	4	4	4	4	3	3	3.88
13	3	4	4	2	3.25	5	4	4	3	3	4	4	4	4	3.88
14	3	4	4	3	3.25	3	2	4	3	3	3	4	4	4	3.33
15	3	2	2	4	2.75	3	4	4	2	2	5	3	4	4	3.44
16	3	2	2	2	2.25	5	4	5	5	3	4	5	5	5	4.55
17	2	4	4	2	3	4	4	5	2	3	3	2	4	4	3.44
18	3	2	2	4	2.75	5	4	5	3	3	3	3	4	4	3.4
19	3	4	4	3	3.5	1	4	4	1	1	1	1	3	4	2.22
20	3	4	4	3	3.5	3	4	4	4	3	5	1	4	4	3.5

Average Consumer Score vs. Household Income



Each dot represents one surveyor's place on the Average Consumerism vs. Household income graph. There is a weak correlation between surveyor's household income and consumer score. On average, most surveyors score a 3 on the average consumption score, and majority of the surveyors make more than 100,00 in their household income.

A higher consumer score demonstrates the tendency to buy clothing in large quantities, frequently and bought new. Whereas a low consumer score represents less frequent, less quantity and thrifted or secondhand clothing sourcing.

Conclusion

The results of the experiment displayed a weak correlation between consumer scores and sustainability scores on average. As sustainability scores increased, representing a more environmentally conscious consumer, the consumer score decreased representing a surveyor who represents sustainable ideals in their actual purchasing habits. There was not a correlation between the household income and consumer scores of a survey. The consumer score averaged a 3 consistently across all income brackets and the average sustainability score was 3.5. The lowest consumer score was 2.25, which was an average for two surveyors. One surveyor had a sustainability score of 3.89 and another had a score of 4.55, each had a household income of \$100,000. The highest consumer score was a 4, paired with a sustainability score of 4.33, and a household income of \$100,000. Both hypotheses were disproven, without any distinct trends throughout the results.

The outcome of this experiment was determined by graphing the average consumer scores against sustainability scores for the first hypothesis and by graphing household income to consumer score for the second hypothesis. For the first hypothesis, the survey participants answered questions 2-5 which were averaged to find their personal consumer score, and their answers to questions 6.a-6.1 were averaged to find each surveyor's sustainability score. The data was then graphed to show correlation. For the second hypothesis, the participant's average consumer score was graphed against their household income, answered in question one.

Data found in this project is meant to bring further attention to the mind of the everyday consumer and lead a discussion into more sustainable purchasing habits. The data shows that the more sustainably minded a consumer is the more healthy consumer practices they have hence this can be achieved by education on the negative effects of consumerism. The data of income vs consumer score is meant to settle discrepancies between incomes, the original hypothesis took into account those of a higher financial status not only have more to spend but more freedom as to what they can afford.

Finally, human error in this project could include computing errors hence the math was done all by person. Additional flaws could be the organization of the income bracket question in survey Question 1, it not only should have included a wider range of numbers but also makes for a broad translation onto a graph.

Ideas For Future Research

We would like to try and help the environment as much as we can but making people aware of how their spending habits affect the environment. The next thing we would do is try and get as many people out of the fast fashion factories as we can because of the horrible work conditions that the workers are forced to work in. We would then try and get big companies to be more sustainable.

Acknowledgements

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