The Fast and Furious Overconsumption of Fashion Final Report

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Abstract

This study presents a general modeling framework to investigate how individuals develop perceptions of fast fashion over time, with a focus on the relationship between consumer attitudes and the emotional and social factors driving consumption. The project simulates opinion dynamics within a population of 200 agents, each defined by two evolving opinions: their likelihood of buying fast fashion (X), and their level of concern about the consequences of fast fashion (Y). The model allows these opinions to evolve and indirectly influence one another, ultimately stabilizing at a correlation of -0.6 between X and Y-demonstrating the expected anti-correlation between favorability toward and concern about fast fashion. These results highlight how heterogeneous influences and cognitive processes contribute to the persistence of diverse and fragmented opinion landscapes within social systems.

Introduction

Opinion dynamics is a field that examines how individual beliefs and attitudes evolve within groups of interacting agents, shaped by social interactions, information exchange, and personal cognitive processes (Moussaïd, 2013). In recent years, computational models of opinion dynamics have become powerful tools for understanding complex social phenomena, such as the spread of ideas, the formation of consensus, and the persistence of disagreement within populations.

This project applies an opinion dynamics framework to the context of fast fashion consumption to model the evolution of agents' attitudes toward fast fashion consumption. While fast fashion offers consumers convenience, affordability, and a wide variety of styles, its reliance on inexpensive labor and its significant environmental footprint have sparked increasing ethical and environmental concerns. As a result, public opinion on fast fashion has become increasingly fragmented, with individuals weighing the benefits against the associated social and environmental costs.

The model simulates a population of 200 agents, each initially assigned two independent opinions: X, representing their propensity to purchase fast fashion, and Y, reflecting their level of concern about the negative impacts associated with fast fashion. These concerns encompass a range of issues, including environmental pollution, poor working conditions, short clothing life, and health risks posed by harmful chemicals in fast fashion products.

A key feature of the model is agent heterogeneity. Each agent possesses a unique learning rate (mu), which dictates their susceptibility to influence from others. Agents are also categorized by wealth class-low, middle, or high-based on a uniformly assigned value. This classification affects their likelihood of purchasing fast fashion, with lower-class agents more inclined to buy, higher-class agents less likely, and middle-class agents split evenly. Additionally, each agent is assigned a random advertisement_exposure variable, capturing the non-need-based influences of pervasive fast fashion marketing and social media trends.

Social influence is further modeled through network effects: agents preferentially interact with neighbors whose opinions are similar to their own, reflecting the human tendency toward confirmation bias. The evolution of each agent's X and Y opinions is tracked over 15,000 discrete time steps, corresponding to a total simulated duration of two years.

The resulting opinion landscape is analyzed in terms of collective states-consensus, polarization, and fragmentation (Hegselmann & Krause, 2002). In our simulations, both X and Y opinions exhibit fragmentation, with multiple distinct clusters of agents persisting over time. This outcome is shaped by the interplay of positive and negative influences in the update rules, as well as the structure of social interactions and individual cognitive processes. The model ultimately reveals a strong negative correlation between agents' favorability toward fast fashion and their concern about its impacts, offering insights into the persistent diversity of opinions in contemporary consumer culture.

Model and Methods

Agent-Based Model Overview

To investigate the evolution of attitudes toward fast fashion consumption, I developed an agent-based opinion dynamics model simulating a two-year period, represented by 15,000

discrete time steps. The model comprises 200 agents, each characterized by two continuous opinion variables:

- X: Likelihood of purchasing fast fashion (range: 0 to 1)
- Y: Level of concern against fast fashion (range: 0 to 1)

Agent Heterogeneity

Each agent is assigned an individual learning rate parameter, μ (*mu*), representing the agent's susceptibility to influence or willingness to update their opinions based on interactions with others.

Wealth Class Assignment

Agents are uniformly assigned to a wealth class, encoded as a continuous variable between 0 and 1:

- Low class: $0 \leq \text{wealth} < 0.3$
- Middle class: $0.3 \leq \text{wealth} < 0.81$
- High class: $0.81 \leq \text{wealth} \leq 1$

Wealth class influences purchasing behavior: lower-class agents are more likely to purchase fast fashion, higher-class agents are less likely, and middle-class agents do not have a preference.

Advertisement Exposure

Each agent is also assigned a random variable, advertisement_exposure, capturing non-need-based influences such as marketing, social media trends, and peer pressure to consume fast fashion.

Social Network and Neighbor Selection

Agents interact with neighbors determined by opinion proximity, reflecting the tendency for individuals to seek confirmation bias by associating with others holding similar views.

Polarization

Agents with strongly held opinions (X or Y > 0.85) are labeled as polarized and are less likely to update their opinions, reflecting resistance to influence.

Update Likelihood of Purchasing Fast Fashion (X)

X(:,i+1) = X(:,i) + mu.*(a_X - X(:,i)) - beta.*Y(:,i).*X(:,i) + increase_x

- **X(:,i)** represents the agent's previous opinion (it is the X-value at (current i - 1))
- **mu.*(a_X-X(:,i))** is the attraction to the average of nearby agents

- **beta.*Y(:,i).*X(:,i)** is the concern regarding fast fashion, essentially the questioning of if the benefits of purchasing fast fashion outweigh the consequences of it
- **beta** represents the individualized concerns each agent has regarding fast fashion
- **increase_x** is the variable to represent the motivations behind purchasing fast fashion (wealth class variable plus the advertising_exposure variable)

Update Level Of Concern Against Fast Fashion (Y)

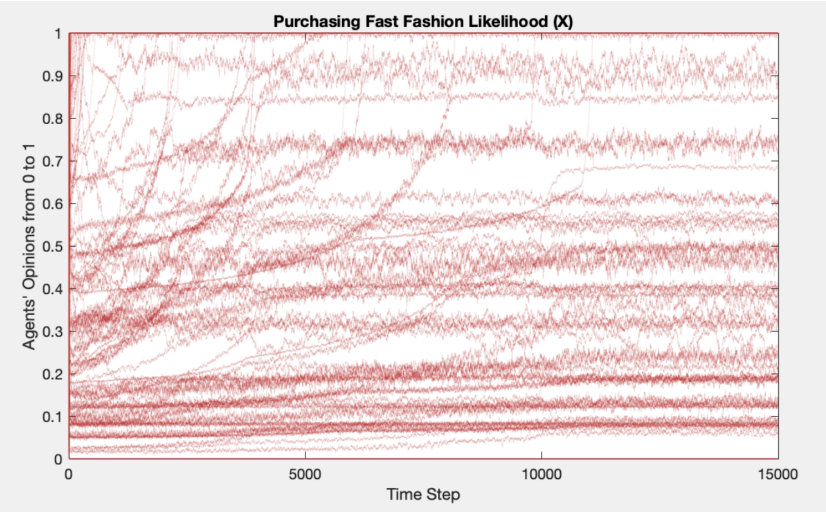
Y(:,i+1) = Y(:,i) + mu.*(a_Y - Y(:,i)) - gamma.*max(X(:,i)-x_normal,0).*Y(:,i) + delta .* max(y_normal - Y(:,i), 0);

- Y**(:,i)** represents the agent's previous opinion
- **mu.*(a_Y-Y(:,i))** is the attraction to the average of nearby agents
- **gamma.*max(X(:,i)-x_normal,0).*Y(:,i)** represents the cognitive dissonance of agents. If an agent has conflicting beliefs, a high X and Y, "then a change in their cognition may occur to cause greater alignment between the beliefs in order to reduce this dissonance" (Harmon-Jones, Eddie)
- **gamma** represents the impact of having a fashion consumption influence on concern variable
- **x_normal** is the acceptable X opinion (0.50)
- **delta .* max(y_normal - Y(:,i), 0)** is the relaxation of the concern variable (where agents have a low Y) toward some normal value
- **y_normal** is the acceptable Y opinion (0.25)

Results

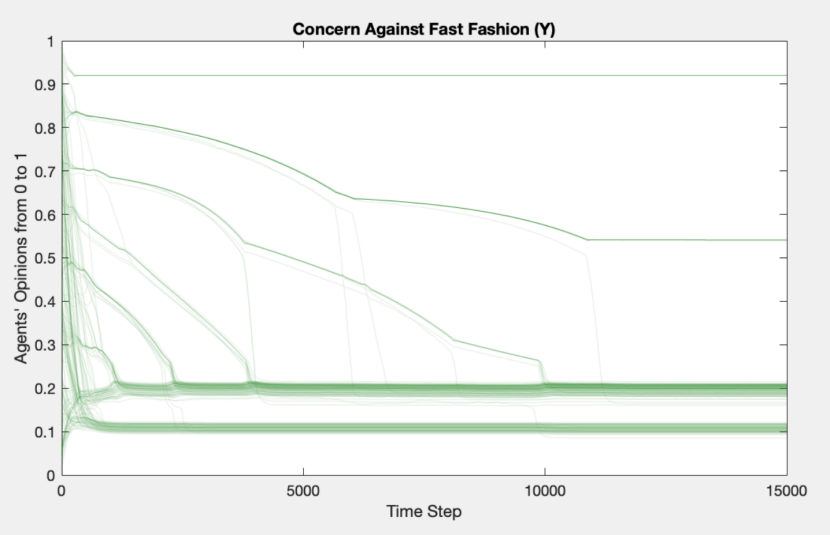
There are three primary collective states in opinion dynamics: consensus, polarization, and fragmentation (Hegselmann & Krause, 2002). Fragmentation occurs when multiple distinct clusters of opinions emerge within a population. In the model, after the simulation is run, the agents' X and Y opinions form several distinct clusters, indicating the emergence of fragmentation within the group.

Fragmentation In X's Opinion Space



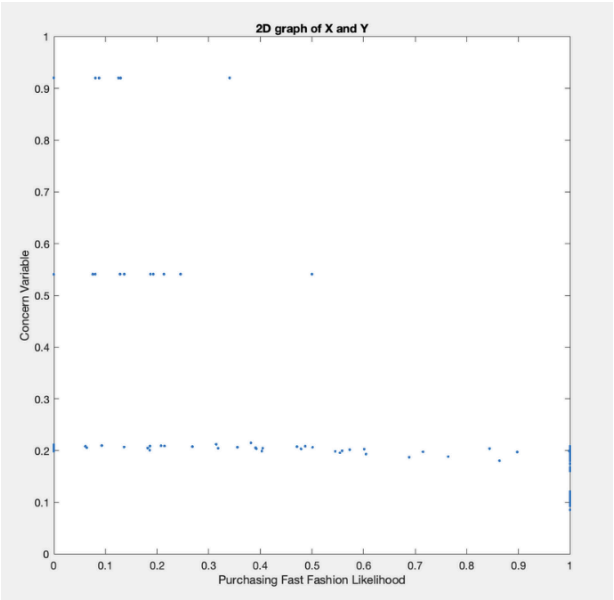
Fragmentation in the X opinion space arises from several factors, particularly the complexity of X's update rule, which incorporates both positive and negative influences on agents' opinions. The observed variability, or "noise," in opinions reflects the dynamic nature of consumerism, where individual wants and needs are constantly shifting. The presence of multiple clusters further demonstrates that, in an issue as contentious as fast fashion consumerism, many individuals hold strong, divergent opinions which persist over time.

Fragmentation In Y's Opinion Space



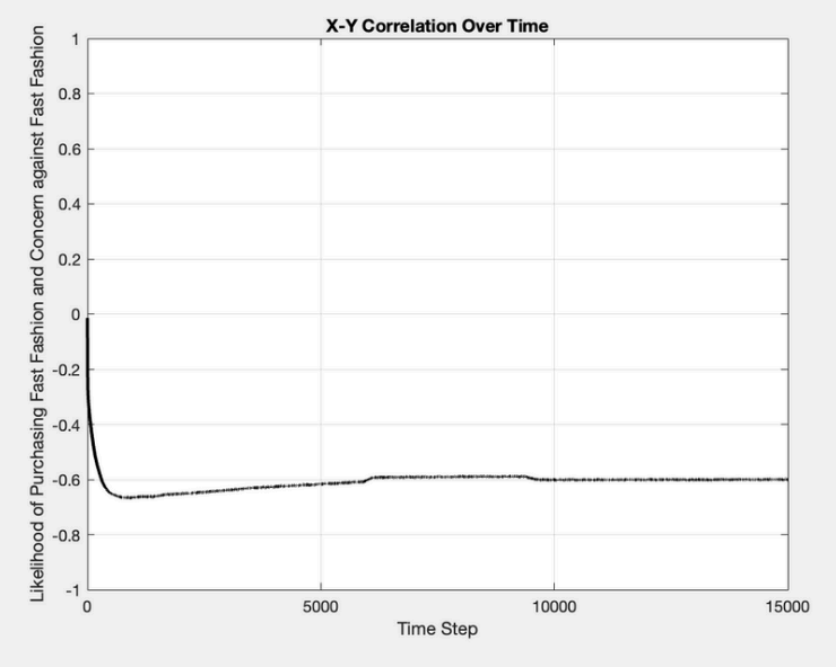
Although the Y graph appears quite different from the X graph, it also exhibits fragmentation, as evidenced by the emergence of multiple distinct opinion clusters. Notably, the Y graph displays downward trends and four distinct groupings. The cluster around 0.22 results from the relaxation mechanism, which draws opinions toward the normative Y value of 0.25. The cluster below 0.15 forms because a subset of agents-shaped by their social influence radius, external biases, and feedback from their own fast fashion consumption-converge and stabilize at a low concern level. Similar dynamics explain the formation of other opinion groups, which generally stabilize after approximately 10,000 time steps.

2D Graph Representing X and Y Relationship



The purpose of this two-dimensional graph is to visualize the distribution of agents across the combined X and Y opinion spaces, highlighting the various clusters that emerge. Some agents exhibit both low X and low Y values, indicating indifference toward both fast fashion consumption and concern about its consequences. Others display a typical level of concern about fast fashion (Y near the normative value) yet still engage in purchasing fast fashion (high X values). A notable pattern is the concentration of agents with low concern values (e.g., Y ≈ 0.15, as previously discussed) at the maximum X value (X = 1). These agents are highly likely to purchase fast fashion with little to no concern for its impacts. Another significant cluster consists of agents with above-average concern (Y ≈ 0.55). Within this group, X values range widely from below 0.1 to 1. While it may seem contradictory for some agents to express high concern yet still have a high likelihood of purchasing fast fashion, this can be explained by need-based motivations. For instance, some individuals may purchase fast fashion out of necessity-such as seeking affordable, long-lasting clothing or finding sizes not readily available in sustainable fashion options. Finally, agents with extremely high concern values (high Y) are much less likely to purchase fast fashion, which aligns with intuitive expectations. This two-dimensional clustering further expresses the complexity between consumer attitudes and the emotional and social factors driving consumption.

X-Y Correlation Graph



Ultimately, the correlation between X and Y is negative, stabilizing at approximately -0.6. This indicates that agents who are highly likely to purchase fast fashion (high X) generally exhibit low concern about its consequences (low Y), and vice versa. Although this correlation is calculated across all 200 agents, it is noteworthy that the presence of agents who have similar X and Y values (indifferent agents or agents who are driven based off of their needs to purchase fast fashion) moderates the overall correlation.

Discussion and Outlook

This model highlights the complex psychological, economic, and social factors that drive fast fashion consumption—an activity often perceived as unethical. By simulating how individual attitudes and behaviors evolve, the model raises important questions about agency, responsibility, and the broader economic structures that make fast fashion the only viable clothing option for many people.

Economically, the model underscores how poverty, affordability, and global labor markets shape consumer choices. It prompts us to ask: To what extent are consumers driven by necessity rather than choice? How do low wages and precarious employment in garment-producing countries perpetuate cycles of poverty and inequality? Who truly benefits from fast fashion's economic growth, and at what cost to workers and communities? The model also encourages reflection on whether the availability of cheap clothing is a solution to economic hardship or a symptom of deeper systemic issues. A relevant illustration is Terry Pratchett's "Boots Theory," which explains how poverty forces individuals to buy cheap, low-quality goods that need frequent replacement, ultimately costing more over time than higher-quality items. As Pratchett observes, "A man who could afford fifty dollars had a pair of boots that'd still be keeping his feet dry in ten years' time, while a poor man who could only afford cheap boots would have spent a hundred dollars on boots in the same time and would still have wet feet." This cycle keeps people trapped in poverty and helps explain why fast fashion, with its low upfront cost, is so prevalent among lower-income consumers. The model also encourages reflection on global inequalities, as the benefits of affordable fashion in wealthy countries are often built on the exploitation of vulnerable workers elsewhere.

On a psychological level, the model explores why individuals continue to purchase fast fashion despite knowing its negative impacts. It raises questions about the roles of instant

gratification, cognitive biases, and social influence. How do marketing tactics and social media fuel impulsive buying and the desire for social acceptance? Why do people rationalize or minimize the significance of their own actions-a mindset sometimes called the “drop in the ocean” effect? The model also prompts inquiry into cognitive dissonance, examining how consumers reconcile their values with their behaviors when they are fully aware of the consequences of purchasing fast fashion.

Furthermore, social pressures, amplified by social media and the desire to keep up with trends, also play a major role in driving people to engage in the consumption of fast fashion. The constant exposure to new products and styles encourages frequent purchases, often at the expense of environmental concerns. Sociologically, the model examines how social norms, peer influence, and cultural trends drive fast fashion consumption. It asks: How does the pressure to keep up with trends and maintain a certain image shape collective behavior? What role does social media play in accelerating trend cycles and normalizing overconsumption?

In summary, this model not only simulates opinion dynamics but also invites deeper questions about the economic systems, psychological motivations, and social forces that sustain fast fashion. It challenges us to consider where responsibility lies—whether with individuals or within systemic issues like affordability and access—and prompts us to reflect on the true cost of fast fashion for both people and the planet.

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