A systems approach to understanding disruption of global food supply due to the war in Ukraine
(Technical Project)

An exploration of the historical, economic, and cultural influences on portion sizes in the American restaurant industry
(STS Project)

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

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Introduction

When I was a hostess, the restaurant I worked for sold nachos for a whopping $18. How does one get away with charging this much for a mere plate of tortilla chips sprinkled with cheese, jalapenos, and a little chicken, you might ask? Well, the portions were outrageous. One plate of nachos resembled a mountain and was more than enough to feed two for dinner, despite its listing on the appetizers menu. With that amount of food, expecting customers to finish both an appetizer and a main dish is unrealistic and unhealthy.

Why do restaurants serve this much food if it's nearly humanly impossible to eat? And why do we, the customers, pay absurd amounts of money for food we will likely end up throwing away? My STS research explores these topics under the central question: what historical, economic, and cultural factors incentivize American restaurants to serve oversized portions?

Serving excessive amounts of food gives customers an ultimatum: eat too much, or throw it out. On one hand, when presented with more food, we are likely to eat past fullness due to psychological phenomena that influence our consumption behaviors. But if people do not overeat, copious amounts of food waste, and consequently greenhouse gas emissions, are produced. It is a lose-lose situation.

It is particularly important to be intentional about food given the current food crisis sparked by the war in Ukraine. The crisis is a culmination of multiple weaknesses in the food system that have been brewing for years, and the war was the tipping point. My technical project attempts to understand the connections between various players in the crisis: war, climate change, COVID-19, the energy crisis, export restrictions, and foreign policy. The goal is to

compile a report with data analysis and visualization demonstrating how the Ukraine conflict impacts global food stocks and the global supply chain.

This prospectus will begin with a discussion of the technical project, which provides a summary of how Russia's invasion disrupted the global food supply, and how political reactions to the war make matters worse. Then, I begin to discuss my STS topic with a detailed justification of why this research is important due to public health and sustainability implications. I then provide an explanation of the key players in this problem and how they inform the intended framework and methodology.

Technical Topic: A systems approach to understanding disruption of global food supply due to the war in Ukraine

The War in Ukraine could push 47 million people into famine (The Economist, 2022). As a result of the conflict, food production and exports have been disrupted in both Russia and Ukraine. This has impacted the supply chain on a global scale because both countries are top exporters of some of the most vital staple foods. In turn, countries that heavily rely on Russia and Ukraine for food face shortages and high import bills. Those who get their grain elsewhere are not immune to these repercussions-- food prices have risen dramatically everywhere since Russia's invasion. It is clear that we are facing a global food crisis, and for some countries, the consequences are deadly.

In order to understand why the events of two countries can have such a drastic impact, it is necessary to establish that our supply chains are very concentrated. Together, Russia and Ukraine produce 28% of the world's traded wheat, 29% of the barley, 15% of the maize, and 75% of the sunflower oil (The Economist, 2022). The war began preventing Ukraine's goods from reaching global markets when Russia blockaded the Black Sea ports, a major channel for exporting grain. As a result, millions of tons of Ukrainian grain haven't been shipped to the many countries that rely on it. "Nearly 50 countries depend on either Russia or Ukraine, or both, for more than 30% of their wheat imports; for 26 of them the figure is over 50%" (The Economist, 2022).

The impact of these challenges is most grave for countries that are net importers. Among these nations are Pakistan, who gets 87.8% of its wheat from Russia and Ukraine, Egypt (85.6%), Turkey (76.5%), Lebanon (75.5%), and Bangladesh (54.8%) (The Economist, 2022). With the majority of their grain supply cut off, these countries are at risk of hunger and unrest.

Shortages have “driven up prices and increased food import bills for the most vulnerable countries by more than $25 billion,” (Edwards, 2022).

Food accessibility issues have been exacerbated by governments’ implementation of trade restrictions in response to the crisis. Policies like these make matters worse because of the multiplier effect, which occurs when unilateral trade restrictions fuel additional policy activism and higher prices. The impact of India’s ban on wheat was particularly notable since grain prices were already high: “on May 16th, the first day of trading after India imposed its restrictions, wheat prices in Chicago, the global benchmark, rose by 6%; on May 18th they were 39% higher than they were when Russia launched its invasion,” (The Economist, 2022).

STS Project: An exploration of the historical, economic, and cultural influences on portion sizes in the American restaurant industry

My STS project seeks to examine why restaurants serve oversized portions. The research question focuses on the historical, economic, and cultural influences that have incentivized restaurants to increase portion sizes. This topic will provide insight into ways to mitigate the negative impact of the restaurant industry on public health and sustainability.

Abnormally large portion sizes are one of the main reasons for the United States' obesity problem. A video from Insider magazine comparing U.S. and U.K. fast food portions found alarming differences, with the U.S. size being double that of the U.K. in the case of KFC's large french fries (Avella, 2021). Such large portions are appealing to consumers because we see them as a bargain-- we get more food for less money. However, this mindset is faulty because we still pay for more than we need, regardless of whether we get a better bang for our buck. Consumers may rationalize this by planning to save their leftovers for a second meal, but a phenomenon called the portion size effect makes it difficult to resist overeating. When presented with an excessive amount of food, restaurant diners experience "portion distortion." Instead of relying on body cues signaling fullness to tell them when to stop eating, they decide based on the amount of food they see on their plate (Wartenberg, 2022). Habitual overeating causes excessive energy intake, resulting in unwanted weight gain and risk of heart disease, obesity, and diabetes (Wartenberg, 2022).

Oversized portions cause restaurants to produce copious amounts of food waste, which typically goes to a landfill and contributes to climate change. According to the EPA, "when food goes to the landfill, it's similar to tying food in a plastic bag. The nutrients in the food never return to the soil. The wasted food rots and produces methane gas" (Environmental Protection Agency, 2022). In turn, emissions from landfills contribute to climate change because methane is

a greenhouse gas. Alternatively, if restaurants halt harmful practices that lead to food waste, tremendous sustainability benefits become possible. Reducing portion sizes could divert 2.42 million tons of waste from landfills, reduce carbon dioxide emissions by 11.5 million metric tons, and save 578 billion gallons of water each year (ReFed).

Relevant Social Groups

The relevant social groups for this topic include restaurant diners, restaurant owners, chefs, corporate management of chain restaurants, people with nutrition-related health conditions, agricultural policymakers, nutritionists, and consumer behavior psychologists. Each group is either directly impacted by oversized portions or has a unique perspective on them. Due to the limited scope of this project, I will not be including several relevant stakeholders. For example, wholesale restaurant food supply companies like Sysco could be relevant because reducing portion sizes would also reduce demand for bulk supplies. However, I have chosen to leave them out of my research because oversized portions are not meaningful to them. I have also excluded sustainability experts that work with restaurant chains to reduce their carbon footprint, policymakers who implement measures to prevent obesity, and landfill owners. Though these groups may have notable perspectives on food waste and public health, their impact on oversized portions is too distant to be significant. Refining these social groups ensures that my research can delve deeper into the role of key players and prevents spreading too thin across a looser network of stakeholders.

STS Frameworks

I plan to use actor-network theory as a framework for this research. This methodology focuses on the network of relationships between various "human actors" and "natural phenomena" in a given system in order to understand what factors influence each other (Bijker, 2012, Page XLII). Actor-network theory is particularly fitting for my research because some of the major players in this topic are not human; rather, they are processes, abstract ideas, and technologies. The psychological phenomena that cause overeating, the health conditions that result, the economic motivations behind making food portions oversized, agricultural technologies and policies that allow for maximum production, and the food itself all must be considered. Another important part of actor-network theory is discovering where power flows across a network. When it comes to power, it appears the food industry is at the top. Restaurant owners have the potential to have a positive impact on public health on sustainability by adjusting their portion sizes or offering size options, but many still choose not to. Analyzing motivations and seeing how power flows using actor-network theory will help me to understand why.

Methods

I will use history, philosophy, and psychology as the main methods for my research. In particular, I will examine the history of policies and economic circumstances that have made oversized portions profitable. As for psychology and philosophy, an understanding of cultural and psychological phenomena that lead to overconsumption will provide insight into the consumer behavior aspect of this topic. Drawing connections between literature on sustainability,

nutrition, policy, and the food industry will help me holistically understand how portion sizes got to be so large.

Timeline

This semester, I have focused primarily on researching how oversized portions came about. The primary areas of interest are agricultural policy that made food cheaper, the history of the restaurant industry, and the growth of consumer culture. Then, at the beginning of next semester, I will shift my focus to consumer psychology research on why we overeat and explore the concept of portion distortion in depth. In the middle of the second semester, I will look at the ramifications of oversized portions by examining studies on their relationship to obesity and food waste. Throughout this process, I plan to use the perspectives of some of the key stakeholders I mentioned above, particularly nutritionists and consumer behavior psychologists.

Key Texts

In *Energy Contents of Frequently Ordered Restaurant Meals and Comparison with Human Energy Requirements and US Department of Agriculture Database Information*, Tufts University concludes that 92% of restaurant meals exceed the recommended calorie content for a single meal. Furthermore, they found that there are not significant differences between the meal energies of chain and non-chain restaurants, whereas previous studies primarily focused on chain restaurants. This piece has informed the foundation of my research by proving that oversized portions exist in the vast majority of the food industry, regardless of whether it is a fast-food chain or a small business.

Patterns and Trends in Food Portion Sizes, 1977 - 1998 is a fundamental study in the domain of oversized portions. This research concludes that portion sizes and energy intake have increased significantly over the 20-year period, with the greatest increases in consumption being at fast food establishments and in the home. These findings will be important in the history component of my research. Knowing how portion sizes have changed during this time period, I can look to policies and cultural developments that may have incentivized larger portions over those years.

In *Waste on the Menu,* Jonathan Bloom argues for giving consumers the choice of reduced portion sizes. This chapter navigates through interviews with owners and waitstaff at various restaurants, collaboration with restaurant analysts, case studies on restaurants with unique methods for reducing waste, and syntheses of previous studies. This piece is going to be one of the most influential in my research because it provides me with many valuable statistics like the percentage of meals that are leftover and the percentage of leftovers that get discarded. I intend to use these statistics to justify my argument in the food waste section of my paper. This chapter also delves into a case study on reduced portion sizes that I intend to explore further: TGI Fridays' wildly successful "Right Portion, Right Price" menu. In addition, Bloom briefly discusses the history of the restaurant industry and how competition between businesses contributed to the growth of portion sizes, which will be key to the "how oversized portions came to be" part of my research. Overall, this book provides a solid framework for the advocacy of a "less for less" mentality and giving the decision of how much to eat back to the consumer. These arguments will be foundational to my research.

Finally, in the TV episode titled *The Men Who Made Us Fat*, journalist Jacques Peretti explores how eating habits have changed over the past 40 years. He discusses the history of

supersizing, explaining how it boosts both food consumption and profits. He also speaks with industry professionals about oversized portioning practices such as value meals and king-size snacks. This is critical to my research because it provides the perspective of those who work in the food industry, which is one of my relevant social groups. These findings are also useful to the part of my paper discussing economic factors that make oversized portions profitable.

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