SHOP MORE, BUY LESS: A QUALITATIVE INVESTIGATION INTO CONSUMER DECISIONS THAT LEAD TO FOOD WASTE IN U.S. HOUSEHOLDS

by

Victoria K. Ligon

A Thesis Submitted to the Faculty of the

SCHOOL OF FAMILY AND CONSUMER SCIENCES

In Partial Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

with a major in Retailing and Consumer Sciences

In the Graduate College

THE UNIVERSITY OF ARIZONA

2014

STATEMENT BY AUTHOR

This thesis has been submitted in partial fulfillment of requirements for an advanced degree at the University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this thesis are allowable without special permission, provided that an accurate acknowledgement of the source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the Dean of the Graduate College when in his or her judgment the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

SIGNED: Victoria K. Ligon

APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

Anita D. Bhappu May 12, 2014

Anita D. Bhappu Date

Associate Professor of Retailing and Consumer Sciences

ACKNOWLEDGEMENTS

I gratefully acknowledge the guidance, support, and helpful insight provided by my thesis committee, Dr. Anita Bhappu, Dr. Sabrina Helm and Dr. Michael Staten, through all phases of this research endeavor. I am also indebted to the Norton School of Family & Consumer Sciences for their financial support of this project. Finally, I am thankful to all of the participants in this study who took the time to talk about and document their efforts toward food provisioning.

Table of contents

ABSTRACT

Estimates suggest that 40% of the food grown in the United States ends up in landfills. Household losses are the highest contributor to volume of waste overall, and individual households are estimated to discard around 15% of their total acquired food inventory. Consumers are generally waste averse and a vast majority have been shown to object to wasting food in particular, yet almost all consumers discard a substantial volume of potentially edible food each year. This exploratory qualitative study sought to uncover underlying psychological mechanisms behind this discrepancy between attitude and behavior by exploring the decision-making processes that consumers engage in as they acquire, prepare, consume and discard food. By exploring the patterns of thinking that shape household provisioning practices through an initial in-depth interview, a two-week long household food diary and a follow-up interview with 17 diverse consumers, a grounded theory emerged to explain this counter-intuitive behavior pattern. Extending research from behavioral economics and decision making literature, data from this study suggests the following: 1) people evaluate cost of goods based on incomplete value estimations that fail to account for the costs associated with discarding potentially edible foods; 2) costs associated with the act of shopping are salient and encourage less frequent provisioning trips; 3) people do not adequately account for costs associated with overbuying and storing food; and 4) consumer strategies aimed at maximize efficiency in food acquisition through less frequent shopping trips may actually result in increased inefficiency in the form of greater waste and higher overall cost of goods. Based on emergent findings, a strategy for waste avoidance is presented along with managerial implications.

1. Introduction

Global food shortages pose a grave threat (UN, 2011; Escaler & Teng, 2011). A growing human population combined with drought and a changing climate mean that more and more nations may have trouble meeting the nutritional needs of their populations (Halweil & Nierenberg, 2011; UN, 2011). While experts differ on how this issue can be tackled, discussions aimed at reducing food shortages have often focused on strategies to increase food production (Escaler & Teng, 2011). Suggestions include educating small farmers in sustainable agriculture techniques, spreading modern industrial agriculture practices to less developed nations, investing in technology and introducing more genetically modified crops (Halweil & Nierenberg, 2011; UN, 2011). Often overlooked are strategies aimed at reducing the amount of food that is currently being wasted (Escaler & Teng, 2011; Halweil & Nierenberg, 2011) -- that is, of more efficiently distributing and using the food that is already being produced. This is especially true in nations outside of the European Union where the European Commission set a goal of halving the disposal of edible food waste by 2020 (European Commission, 2011) and the European Parliament designated 2014 as the 'European year against food waste' ("Tackling Food Waste," 2014).

Although studies cite different figures, and limited data exists (Lebersorger & Schneider, 2011) some reported metrics on the quantity of food wasted annually in the United States include: 40% of the total available food supply (Hall, Guo, Dore & Chow, 2009); $165.6 billion (Buzby & Hyman, 2012) and 34 million tons (EPA, 2012). There are significant resources lost in any system that is so vastly inefficient. For instance, one research team estimated that 25% of the total fresh water consumed in the United States is being used to grow crops that ultimately get discarded (Hall et al., 2009). In addition, calculations based on 2003 waste statistics projected

that 300 million barrels of oil were required to grow the food that was thrown away in the US that year (Hall et al., 2009). This figure only accounts for oil used on the farm to grow crops. A complete understanding of the costs associated with wasted food should include a lifecycle assessment (Hertwich, 2005) including resources used to manufacture and distribute food products from the farm all the way to the consumer's kitchen. Such an assessment would have to account for all of the "arable land, labor, energy, fresh water, agricultural chemicals (e.g., fertilizer, pesticides) and other inputs" required to produce consumable foods (Buzby & Hyman, 2012).

Finally, the costs of landfilling food should be considered. Food waste is the second largest category of materials in the municipal waste stream, after paper, and the US is estimated to spend 1 billion dollars a year disposing of discarded food (EPA, 2012). In addition to wasting money, landfilling food creates a significant environmental burden. In the US, landfills are one of the largest sources of human produced methane gas emissions (Schneider, 2008; EPA, 2011). Methane is known to be 25 times more potent than carbon dioxide in heat trapping properties that contribute to global warming (Hall et al., 2009). Although some landfills have begun to capture methane gas emissions as a source of energy, much of the methane produced in landfills is still being released into the atmosphere (EPA, 2011).

While it is beyond the scope of this paper to detail the many environmental challenges associated with modern industrial agriculture, it stands to reason that if less food were required to feed the population (because of increased efficiencies related to production and delivery of that portion of food that is actually consumed by households), then the scale of agricultural production could be decreased and, as a result, negative environmental impacts would be reduced. While no food system can ever completely eliminate losses, a government

commissioned report from the UK estimated that it might be realistic to halve the current rate of food loss by 2050. Using a conservative estimate for global food waste of 30%, halving the total amount of waste by 2050 would reduce the quantity of food needed to feed the world population by an amount equivalent to 25% of today's production (Foresight, 2011).

In addition to environmental burdens and financial costs to society, food waste can have a negative impact on individual consumers. While the quantity of waste being generated by an individual household may seem inconsequential when considered on a daily or even weekly basis, the total food waste generated by households can be substantial. Using contemporary archeological techniques that measured refuse from individual homes, Jones (2005) quantified annual household food losses in the United States at over $40 billion per year with an annual average of $589.76 for a household of four (Jones, 2005). This dollar amount represents an average volume loss of over 467 lbs per year per household (Jones, 2005). In a separate study, Buzby & Hyman (2012) estimated US food losses to be 123.9 kg (272.6 lbs) per person (including food discarded away from home at restaurants). This number translates into $390 of discarded food per person, per year, at 2008 retail prices; an amount equivalent to 10% of the average consumer's annual expenditure on food (Buzby & Hyman, 2012). Buzby and Hyman estimated that the average American discards $1.07 of potentially edible food per day with the average American household discarding $936 of food per year (for a household of 2.4 persons). The discrepancy between the studies may be attributable to the difference in inclusion criteria for measurement between the studies (Buzby and Hyman include away-from-home discards at restaurants in their analysis whereas Jones seems to have measured just household refuse) but also points to challenges associated with accurately measuring food waste (Garrone, Melacini & Perego, 2014) and the need for additional research on US food discard practices (Buzby &

Hyman, 2012). Both studies concur that US residents are spending substantial sums on food that is ultimately thrown away (and statistics on food loss in other developed nations are substantial as well, for instance, Quested, Marsh, Stunell & Parry, 2013, report that households in the UK discard approximately 160 kg (352 lbs) of avoidable food waste each year while Doron, 2012, finds that the average UK household with/without children annually discards £700/£480 of potentially edible food).

These substantial per capita waste statistics are surprising given that, in general, consumers are waste averse (Bolton & Alba, 2012; Watson & Meah, 2013) and dislike the experience of throwing away food (Stefan, van Herpen, Tudoran, & Lähteenmäki, 2013). In a survey of 1300 British consumers, over 70% were "bothered" by the waste of money associated with throwing food away (Quested, et al., 2013). In addition, the vast majority of people surveyed experience guilt when confronted with a choice to discard (Quested et al., 2013). If wasting food is so widely disliked, and so clearly detrimental, why do we throw so much away? By age 30, an individual has likely spent a decade establishing adult routines and habits for purchasing, using and discarding food. According to Kolb (1984) "learning is the process whereby knowledge is created through the transformation of experience" (p. 38). In theory, a practice that is costly and unpleasant would be one that an individual would learn to minimize through experience. In fact, people do not appear to get better at minimizing food waste as they age. Though British consumers over age 65 have been shown to waste less than other age groups (possibly related to their experiences of living through food rationing following World War II), significant differences did not emerge between other age groups studied (Quested et al., 2013). As "learning from experience" does not appear to be happening, why not?

2. Research Aims and Purposes

While there has been some attention paid, in recent years, to the problem of food waste, most academic studies and government reports have focused on volume of food wasted and quantifiable measures of the effects of waste such as environmental impacts and costs to industry and households (for example: Van Garde & Woodburn, 1987; Jones, 2005; Schneider, 2008; Griffin, Sobal & Lyson, 2009; Hall et al., 2009; Parfitt, Barthel & Macnaughton, 2010; Bridgwater & Quested, 2011; Hodges, Buzby & Bennet, 2011; Muth, Karns, Nielsen, Buzby & Wells, 2011; Quested, Parry, Easteal & Swannell, 2011; Lebersorger & Schneider, 2011; Buzby & Hyman, 2012). A number of studies have considered behavioral patterns and demographic factors that contribute to or are correlated with increases in household food waste (for example: Van Garde & Woodburn, 1987; Sonesson, Anteson, Davis & Sjödén, 2005; Corrado, 2007; Glanz, 2008; Parfitt et al., 2010; Quested et al., 2011; Stefan, 2011; Morisaki, 2011; Stefan et al., 2013; Quested et al., 2013). A few have examined motivations and barriers to food waste minimization (Graham-Rowe, Jessop & Sparks, 2013; Quested et al., 2013; Watson & Meah, 2013). A very small number of studies have considered the ways that food waste production is connected to the complex enactment of routinized practices of food provisioning (Evans, 2011, 2012; Watson & Meah, 2013). Almost all prior studies on food waste have called for additional research into this complex, understudied and globally significant topic.

Particularly understudied in the existing literature is how underlying psychological mechanisms may shape consumer decisions that contribute to food waste. The central research question guiding this study is: *When making decisions about food acquisition, preparation, consumption, and discard, how do psychological mechanisms impact the generation of food waste at the individual level?* Using exploratory qualitative data, the present study contributes to

the overall understanding of household generated food losses by examining the ways that food provisioning practices that contribute to food waste are themselves influenced by heuristics and cognitive biases. By probing consumer's patterns of decision making around food acquisition, preparation, consumption and discard, several useful insights emerged that may help to shape effective delivery of waste intervention policies in the future. In addition, a significant contribution of this study is the use of an American consumer sample of as almost all prior works examining factors influencing food waste patterns (rather than quantities of food wasted) have been conducted outside of the United States (exceptions include Van Garde & Woodburn, 1987; Jones, 2005; and Bloom, 2010).

The remainder of this paper will be organized as follows: the next section details a selection of relevant literature related to existing knowledge about demographic and behavioral factors that contribute to food waste generation as well as decision making processes that may impact an individual's propensity to overbuy and overprepare food. The section after that offers an overview of the theoretical lens through which data in this study was viewed. The following section details the grounded theory methodology undertaken in this study to collect and analyze data about consumer acquisition, preparation, consumption and discard of food. After the methods section is a detailed discussion of study findings. Finally, study contributions and implications are discussed along with limitations and future research opportunities.

3. Literature Review

3.1 Defining Food Waste

Food waste can refer to a number of different types of unconsumed food. For the purpose of this study, discussions of food waste will refer specifically to losses that were "potentially recoverable for human consumption" (Hodges et al., 2011, p. 38). This “avoidable waste” includes whole unused food items, partially consumed food items and leftovers (but does not include “preparation residues” like onion skins) (Lebersorger & Schneider, 2011). Analysis of UK consumers’ waste patterns has shown that avoidable waste makes up over 60% of the household food waste stream with “possibly avoidable waste” – foods that are edible but that some consumers choose not to eat, such as potato skins – making up an additional 20% of household discards (Quested et al, 2011).

Though losses occur on the farm, in distribution and at the retail level, in the United States, as well as other developed nations, a majority of loss takes place at the post-consumer stage (Parfitt et al., 2010). Jones (2005) reported that US households discard, on average, 14% of their total acquired food inventory (for comparison, Quested et al., 2013, quantified UK household losses at 12% of total acquisition). Separately, Hodges et al. (2011) estimated that US households collectively discarded 17% of the total available food supply in 2008. In contrast, the retail sector (grocery stores, farmers markets, convenience stores) collectively discards 5.63% of their total food inventory according to Jones (2005), which, according to Hodges et al. (2011) represented 9% of the total available food supply in 2008. In their community-level analysis of the food waste generated by one US county for one year (1998-99), Griffin et al. (2009) found that consumer generated waste accounted for 60% of the total food waste stream. All of these

studies agree that households represent the largest proportion of food waste generation from among the sectors (Jones, 2005; Griffin et al., 2009; Hodges et al., 2011; Parfitt et al., 2010) and Parfitt et al. (2010) forecast that the majority of food waste in the developed world is likely to continue to occur at the hands of consumers.

Given the magnitude of household losses, as well as the substantial challenges associated with meaningful reductions in waste at this level (Quested et al., 2013), the present study is focused on the decisions made by individual consumers. Future references to "food waste" in this paper will refer specifically to "avoidable" discard of foods by individuals. Though the present study is focused on the United States, much of the research to date on factors related to consumer food waste has been collected outside of the US, most often in Europe. Because previous studies have grouped developed nations together in discussions of global food waste (Escaler & Teng, 2011), the present study assumes that factors shown to contribute to food waste practices in other developed countries should apply, more or less, to an American context. Many of the overarching factors contributing to food waste, such as the relative price of food and an increasing appetite for highly perishable goods are similar across the developed world and are therefore likely to impact the United States and other developed nations in similar ways (Parfitt et al., 2010; Escaler & Teng, 2011).

3.2 Factors Contributing to Household Food Waste

Several demographic and cultural factors have been shown to correlate with household waste patterns. For instance, households with children have been shown to waste more than households without (Corrado, 2007; Glanz, 2008; Doron, 2012). On a per capita basis, single

occupancy households discard almost twice as much as four-person households for reasons that include retail package sizing, volume discounts that encourage bulk buying and recipes scaled for multiple servings (Parfitt et al., 2010; Quested et al., 2013). Investigations into a relationship between wasteful behaviors and income have returned mixed results (Parfitt et al., 2010), but individuals that work full time are known to waste more than people who are under or unemployed (Glanz, 2008). Frequency of dining outside of the home is also positively correlated with volume of waste (Jones, 2005). Finally, complexity of ethnic cuisine can influence likelihood of food discards. In Mexican cuisine, for instance, a relatively small number of ingredients get combined in different ways to produce a variety of dishes (Bloom, 2010). This may be why Hispanic households in the US have been found to discard approximately 25% less than comparable non-Hispanic households (Parfitt et al., 2010). The limited number of ingredients reduces the likelihood that items will spoil before use (Bloom, 2010).

In addition to demographic and cultural factors, several behavioral patterns have been shown to drive increases or decreases in food waste volume for households. Behaviors that reduce the production of food waste can be divided into three broad categories: planning activities, inventory management, and appropriate storage procedures (Quested et al., 2013). Pre-shopping planning is negatively correlated with food waste as people who make (and stick to) shopping lists and evaluate current inventory before shopping tend to buy fewer unnecessary items (Corrado, 2007; Stefan, 2011). Overbuying, on the other hand, is a major contributor to overall food waste generation (Corrado, 2007; Stefan, 2011). Factors that lead to overbuying can include shopping infrequently (less than once a week), stocking up on bargains or discounted items, plentiful kitchen storage space including backup freezers, impulse shopping and purchasing in bulk, particularly of perishable goods (Corrado, 2007; Stefan, 2011; Morisaki,

2011). In addition, people who enjoy a great variety of foods in their diet or who like to experiment with new ingredients are likely to produce more waste than those who stick to a food routine (Corrado, 2007). Finally, poor food storage techniques such as ad hoc refrigerator cleaning systems, the absence of food rotation techniques or storing goods in inappropriate containers contributes to greater waste (Glanz, 2007).

Complex ideas about American abundance and modern consumer lifestyles may also play a role in the American tendency to acquire 'too much food.' Americans have a unique national identity as residents of one of the most resource-rich, economically successful nations in history (Bentley, 1995). Modern Americans reside in a consumer society that often equates life satisfaction with the acquisition of more and better 'things' (Richins & Dawson, 1992). Exposure to material excess may impact the ways that people shop for food as experimental research has shown that perceptions of abundance lead people to use more resources than they do in comparable scenarios of non-abundance (Zhu & Kalra, 2011). In addition, Allen and Wilson (2005) found that amongst Australian consumers surveyed, those who scored higher on a materialism scale tended to store more food in their homes.

As materialistic values have become increasingly entrenched, the average size of the American single family home has skyrocketed; from 1100 ft^2 in 1940 for a family of 3.67, to 2,340 ft^2 in 2002 for a family of 2.62 (Wilson & Boehland, 2005). With this extra square footage has come an increasingly large kitchen, including, in some instances, a walk-in pantry and expansive cabinet space. In addition, the past thirty years has seen average refrigerator sizes inch up from 19.6 cubic feet in 1980 to 22.5 cubic feet in 2012 and 22% of Americans now have a second refrigerator, compared to just 12% in 1984 (Schwartz, 2012). At the same time, Americans spend a smaller share of their disposable income on food than residents of any other

nation (Kantor, Lipton, Manchester & Oliveira, 1997), and currently enjoy the cheapest food prices in modern history (Pollan, 2010). In the United States, the percentage of disposable personal income spent on food dropped from 23.4% in 1929 to a mere 9.6% in 2008 (Hodges et al., 2011; Drewnowski & Darmon, 2005). Meanwhile, waste disposal in the United States is readily accessible and built into the structure of overall utility costs. These conditions do not present an economic incentive to be conservative about food purchases and larger kitchens may enable the maintenance of a well stocked pantry.

3.3 Decision Making

Broadly speaking, the field of behavioral economics developed to address the shortfalls of normative economic choice models that assumed that individuals make decisions in a purely 'rational' (i.e. utility maximizing) manner (Camerer, 1999). In fact, people exhibit 'bounded rationality' in their choice making because decisions are constrained by existing knowledge and information, ability to cognitively process information and available time (Simon, 1972). In complex decision making situations, individuals have been shown to rely on simplifying heuristics, or rules of thumb, to help narrow choice options (Tversky & Kahneman, 1972). Furthermore, emotions, intuition and social cues can influence choice (De Martino, Kumaran, Seymour & Dolan, 2006). When consumers make decisions that systematically deviate from 'rational' choice, behavioral economics has looked to psychology to explain these deviations. Research has shown that underlying psychological mechanisms that help human beings cope with complex decision situations can at times lead people to behave in ways that might be called 'irrational' (De Martino et al., 2006). The following literature on human decision making

processes may help to illuminate some underlying psychological influences on choice-making that may contribute to the wasting of potentially edible food.

3.3.1 Cognitive biases.

There are two main reasons why food is discarded at the household level: either too much food was prepared or served, or food was not used in time (Parfitt et al., 2010). This latter category includes foods that have passed their expiration dates as well as foods that have molded or otherwise passed the point of being appetizing, both conditions that may stem from a misestimation of consumption preferences. There are a number of cognitive biases that may impact a consumer's decision to acquire or prepare the wrong amount or the wrong type of food. For instance, Chandron and Wansink (2006) found that consumers' estimation of inventory is anchored to average inventory level and that consumers have a tendency to insufficiently adjust for actual stock-on-hand. In a similar case of quantity misestimation, people have been shown to estimate serving size based on the unit size of food packaging, plate size and even shape of dish (Wansink, 1996; Wansink, 2004). These serving size biases may cause people to prepare or serve more food than can reasonably by consumed, which can lead to immediate discard of food left on a plate or eventual discard of leftovers.

Inaccurate affective forecasting can also lead a consumer to acquire too much or the wrong type of food. Though people are pretty good at knowing what they will want in the very near future, they are not very good at predicting what they will want at some later time to come (Kahneman & Thaler, 2006). People are particularly bad at adjusting for the impact of current emotional arousal on expectations of future preferences. Loewenstein, O'Donoghue and Rabin (2003) show that people tend to project that their future emotional state will resemble their

current emotional state. When present and future emotional states do not match, people underestimate the impact of the change in emotional state, a condition known as the hot-cold empathy gap (Loewenstein et al., 2003). For example, in a snack choice experiment, Read and van Leeuwen (1998) found that hungry participants chose significantly more unhealthy snacks for immediate consumption as well as for future consumption one week later, compared to satiated participants. In addition, both hungry and satiated participants were dynamically inconsistent, choosing more unhealthy snacks for immediate consumption compared to future consumption. Gilbert, Gill and Wilson (2002) found that people juggling a cognitive load were significantly more impacted by current hunger on future projections of appetite, compared with people who were not cognitively loaded. Shiv and Fedorikhin (1999) found that when processing resources are limited, affective responses tend to have a greater impact on choice compared to cognitions. Combined, these studies show that a person's emotional state and cognitive load may significantly impact their ability to accurately project what, and how much, food they will desire several days in the future.

People may also be prone to errors in their projections of preferences. Specifically, when making simultaneous decisions about future sequential consumption, people overestimate their preference for variety (Kahneman & Thaler, 2006). In another experiment concerning snack choices, Simonson (1990) found that students who were asked to simultaneously select a snack for each of three future class sessions tended to pick three different snack options, whereas students who were asked to select one snack at the beginning of each of three sequential class sessions tended to choose the same snack each time. This research suggests that people who grocery shop once a week may be overestimating their preference for variety in meals throughout the week.

3.3.2 Prospect theory and mental accounting.

Prospect theory was developed to shed light on the way that people actually make decisions under conditions of risk (Tversky & Kahneman, 1981). Risky situations are those with uncertain outcomes. Food selection at the grocery store might be considered a risky choice in that the probability of actually consuming specific items may be unknown at the time of purchase. One of the key aspects of this theory is a value function that is concave for gains and convex for losses and where the slope for losses is much steeper than the slope for gains (Tversky & Kahneman, 1992). This different treatment of gains and losses is the underlying premise behind loss aversion, a property of decision making whereby the chooser will find losing $X to be more aversive than gaining $X is pleasant (Kahneman & Tversky, 1984). Loss aversion significantly influences a phenomenon known as "mental accounting," which is a way of framing outcomes in terms of how particular choice options should be combined and evaluated against a reference outcome (Tversky & Kahneman, 1981). Though the standard economic model suggests that all money is fungible, research on mental accounting suggests that it is not. Consumers tend to categorize purchases in their minds (Thaler, 1999), for instance by mentally combining all grocery shopping under a category called "food." These labels that get assigned to resources in the consumer's mind have been shown to affect consumption choices (Heath & Soll, 1996).

Another key aspect of mental accounting is an acknowledgment that every transaction has multiple choice-impacting components. Specifically, in any exchange, consumers are said to receive two forms of utility – acquisition utility based on the value of the good received relative to price and transaction utility based on the value of the difference between the price paid and a reference price for the item (Thaler, 1999). Mental accounts are said to be opened at the time that a transaction takes place and closed at the time the acquisition item is consumed. Thaler (1999)

suggests that for small transactions, consumers are unlikely to engage in retrospective evaluations of the purchase once the account is closed. In addition, when payment is "decoupled" from consumption – that is, when there is a time delay between purchase and use – the delay serves to lower the perceived cost of the transaction (Thaler, 1999). Kahneman and Tversky (1984) suggest that costs in a transaction are not the same as losses. In situations where payment is decoupled, such as purchase of food items to be consumed days or weeks in the future, unrealized consumption can still be framed as a cost (rather than a loss). Once consumption is no longer possible, as when food safety concerns dictate that old leftovers should be discarded, for example, then cost must be realized as a loss, which can be unpleasant. A desire to avoid realizing sunk costs as losses can lead people to prolong the possibility of future consumption (Thaler, 1999) by, for instance, delaying the decision to discard surplus food.

3.3.3 Choice overload.

Choice overload is said to result from an overly extensive choice set in a decision making situation. Effects of choice overload can include a decrease in motivation to make a choice, a decrease in satisfaction with a chosen option, a decrease in preference strength for a chosen option, and a general increase in negative emotions, including disappointment and regret (Scheibehenne, Greifeneder & Todd, 2010). Explanations for why a large assortment of choices would decrease motivation to choose, or satisfaction with choice, tend to focus on the increasing difficulty in choosing as options increase, information available about options increases and/or differences between attractive options decrease (Scheibehenne et al., 2010). In large choice sets, the effort involved in evaluating all options may be daunting and as the number of attractive options increases, so too does fear of making an inferior choice (Scheibehenne et al., 2010). A

grocery store is an example of a setting that might induce choice overload and studies of this phenomenon have been conducted in food markets in the past (Iyengar & Lepper, 2000).

Recently, some debate has circulated around the strength of the choice overload effect with several studies documenting a non-effect or even a positive effect of choice on satisfaction (Scheibehenne et al., 2010). For this reason, it may be necessary to consider the effects of secondary conditions on the choice overload phenomenon. One condition of particular relevance for questions related to food acquisition practices is the effect of time pressure on a large choice selection. Haynes (2009) found that the combination of a larger assortment and time pressure led to increased frustration and reported difficulty in a choice situation. Time pressure may be a significant constraint for modern food shoppers and cooks, as research has increasingly documented the plight of the "time-poor" in contemporary American society (Jacobs & Gerson, 2004).

As this brief literature review suggests, there are a number of psychological mechanisms and decision making biases that may impact the ways in which consumers make food choices and which may directly affect an individual's propensity to waste food. Food selection is a complex endeavor that involves cognitive as well as affective components. Choices may be significantly influenced by a variety of external conditions including resource constraints, socialization processes, values and normative belief systems. In addition, the perishable and consumable nature of food ensures that consumers will repeatedly engage in these decisions on an ongoing basis.

4. Theoretical Lens

This study was initially conceptualized as an inquiry into consumers' decision making process at the moment of discard. After deeper reflection following several early participant interviews, it was clear that most "decisions" to discard food are the inevitable outcome of numerous previous decisions made in the course of provisioning a household. After all, at the point that a moldy peach is tossed in the trash, the most interesting question is not: "how was the peach determined to be inedible" but rather, "why was the peach not eaten before it molded?" or "why was the peach purchased in the first place?" or "how did household dynamics, or planning routines, or cooking knowledge or time constraints contribute to the neglect of the peach until after it had molded?" to name just a few possible inquiries that begin to address decisions that were made at a time point before the moldy peach was ultimately discarded.[1] As Quested et al. (2013) point out, "by the time an item of food is thrown away, the opportunity to prevent that food from becoming waste has usually passed." In this way, understanding food waste, and how it can be minimized, is best addressed from the perspective of understanding how the practices of food provisioning may ultimately lead to an item going unused. Reckwitz (2002, p. 249) defines a practice as:

> A routinized type of behavior which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, "things" and their use, a

[1] To be fair, there is an interesting stream of research to be pursued that relates to questions of when and how consumers decide that food is no longer fit for consumption – including examination of how expiration dates are interpreted and how freshness of produce impacts willingness to consume. The present study was not designed to capture data that can adequately answer questions about 'point-of-discard' decision making, however, these issues have received some recent attention and Watson & Meah (2013) provide useful insight into consumers' interpretations of date labels and the ways that individuals negotiate their competing desires to, on the one hand, avoid wasting food, and on the other, avoid consuming foods that might be unsafe. Milne (2013) also offers interesting insight on the history of consumer date labels.

> background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge.

As Quested et al. (2013, p. 44) argue:

> The generation of food waste is best viewed not as a single behaviour but as the result of multiple behaviours that can increase the likelihood or amount of food being wasted. These behaviours relate to many different aspects of food's journey into and through the home: planning, shopping, storage, preparation and consumption of food.

Provisioning behaviors are shaped by numerous influences – factors like family relations, socio-temporal constraints, tastes, infrastructure, societal norms and knowledge to name a few relevant issues. In his sociological investigation into the ways in which food waste may be an inevitable "consequence of the ways in which domestic food practices are socially organized" Evans (2011, p. 431) argues that by individualizing responsibility for wasting food, efforts to combat food waste "miss the ways in which so-called 'waste-behaviors' relate to the dynamics of everyday life" (p. 438).

With this in mind, the present study was conceptualized as an inquiry into 'practice' as a theoretical lens for analyzing consumption. Warde (2005, p. 145) describes the 'theory of practice' as a particularly useful tool for examining consumption behavior because "consumption occurs within and for the sake of practices." Examinations of practice eschew models of analyses based on "either *homo economicus* or *homo sociologicus"* which allows for a rejection of "both the purpose-oriented and the norm-oriented models of explaining action" since behaviors occur within "shared or collective symbolic structures of knowledge" which serve to implicitly shape "which desires are regarded as desirable and which norms are considered to be legitimate"

(Reckwitz, 2002, p. 246). Within this theoretical framework, the present study focused on ways that consumers 'think' in common about their food provisioning to uncover psychological processes – or patterns of thinking - that may ultimately shape the behaviors that increase the incidence of waste. As Reckwitz (2002, p. 250) explains, "the single individual – as a bodily and mental agent" serves as "the 'carrier' of a practice – and, in fact, of many different practices which need not be coordinated with one another." To this end, this study aimed to uncover psychological mechanisms, shared amongst consumers, that seemed to influence the enactment of particular practices of food provisioning that have been shown to increase waste – practices like overbuying, for instance (Corrado, 2007; Stefan, 2011).

5. Method

This study employed a descriptive qualitative research design. Qualitative research is well suited for exploratory topics because a naturalistic setting combined with an emergent approach to data can allow a researcher to deeply probe complex social processes (Creswell, 2013).

5.1 Sample

The primary target audience for this study was informants who were representative of American food preparers and who met basic screening requirements. "Food preparers" refers to that person in a household who is primarily responsible for food acquisition and preparation. In descriptive qualitative research, subjects must be selected for their expertise on the topic being

studied (Morse, 2007). Informants in this study were purposively selected to represent an array of household food preparation experiences, including subjects from diverse household compositions such as singles, couples and families with children. Attempts were made to find food preparers with a variety of time and money constraints such as people who were unemployed, students, part-time workers, full-time workers, retirees and homemakers. In addition, participants were selected to represent a variety of planning tendencies, with list makers and meal planners sampled alongside people who shop "in the moment." Recruitment was done through a variety of online listservs and forums including a campus listserv for university employees and the public library's Facebook page to reach community members at large. Interested participants were asked to complete a screening questionnaire which focused on household composition, responsibilities for food preparation, economic circumstances and planning tendencies (see Appendix A for questionnaire). A total of 122 individuals filled out a completed screening questionnaire during the study recruitment phase. From this group, 22 individuals were invited to join the study, 18 completed an initial interview and 17 completed all aspects of the study and made up the final sample pool (see Appendix B for a complete description of each study participant). Each of these 17 individuals was compensated for his or her participation with a $50 VISA gift card.

5.2 Data Collection

This qualitative project focused on informants who could provide detailed information about the decision making processes that they engaged in when consuming and discarding food. For each informant, data came from the following sources:

- **Screening questionnaire**

Once participants had been selected, screening questionnaires were retained as data to help provide context about the informant's household characteristics as well as planning tendencies and budgetary and time constraints.

- **Receipt**

Informants were asked to save grocery shopping receipts from the time period beginning when they were recruited and ending with their final interview approximately three weeks later. The purpose of this data source was to have documented evidence of actual food purchasing behavior to stimulate conversation during interview phase of the project and encourage more accurate reflection on actual behaviors and mental processes. Receipts were retained in case they were needed to provide context during data analysis phase of the project.

- **Initial interview**

Initial interviews were semi-structured and focused on the participant's shopping routines and patterns, cooking routines and patterns, eating routines and patterns, discard routines and patterns, and decisions to buy the particular items that were documented on store receipts. Interviews were approximately one hour and took place in a lab on the University campus. At the conclusion of the initial interview, food diary expectations were explained and a follow up interview was scheduled.

- **Food diary**

Informants were asked to keep a food diary for two weeks following the initial interview. The food diary was intended to capture a snapshot of actual foods consumed and discarded by informant during the study period. Using an "everyday experience method" was deemed appropriate because such a method can reduce retrospective bias through "structured contemporaneous self-observation" (Reis & Gable, 2000, p. 190). Keeping a food diary was intended to elicit more thoughtful and accurate responses during the second interview as it focused the participant's attention, for two weeks, on behaviors that may often be made without much thought or even conscious awareness. To this end, the food diary was used to prompt more accurate reflection, during the second interview, about how specific decisions were made to prepare, eat and discard particular food items. This was achieved through interview questions such as: "Can you tell me about how you decided to make _____ dish on _____ specific day?" Given the self-reported nature of this method, and the possibility of bias in documenting food consumption and discard, this data source was not designed to accurately capture all consumption and discard choices over the two week period. Previous methodological comparisons of UK consumers' waste behavior has shown that people underreport food discards by as much as 40% in food diaries when compared to analysis of waste streams (Quested et al, 2011).

Food diaries were collected online. Every morning during each participant's two week diary period, individuals received an email with a link to a unique survey that prompted them to fill in everything they consumed for breakfast, lunch, dinner and snacks and everything they discarded at breakfast, lunch, dinner, snack and "other" times during the previous 24 hours. The "other" time slot was explained as a catch-all space to document any

refrigerator clean-outs or other discard decisions that did not take place in the context of preparing a set meal or snack. The use of a unique survey link allowed each individual's food diaries to be linked to their unique participant ID and ensured that diaries were actually filled out on a daily basis, rather than in bulk immediately prior to the second interview. One study participant was dropped from the study due to inadequate diary participation. Overall, 218 daily food diaries were submitted by the 17 final study participants for an average diary rate of 12.8 entries per person.

- **Final interview**

The final stage of data collection was a follow-up informant interview. Each interview lasted approximately one hour. This semi-structured interview focused on actual decision making processes that led to preparation, consumption and discard of specific foods from food diary. In addition, some general follow-up questions were posed about topics related to inventory management, discard practices and socialization experiences related to waste such as whether informants could recall any specific messages they'd received from their family about food waste during childhood. In some cases, receipts were also consulted to inquire about specific food items that had been purchased but that did not show up in two week food diary.

5.3 Data Analysis

Data analysis followed guidelines specified for developing a grounded theory. Grounded theory advocates a principle of constant comparison, theoretical sampling and a balance of deductive and inductive analysis of data (Glaser, 1978). This method is ideally suited to research

questions that seek to understand social processes through the emergence of a data driven theory that explains a particular phenomenon (Goulding, 2002). Grounded theory is typically adopted for understudied topics because “the researcher’s mission is to build his/her own theory from the ground” (Goulding, 2002, p. 55). The emphasis in grounded theory is on development of a comprehensive theory that is grounded in systematically collected and analyzed data sources (Goulding, 2002).

Four data sources were analyzed in this study; the screening questionnaire, the initial interview transcript, the food diary and the final interview transcript. The screening questionnaire was examined to extract basic demographic information about the participant household. In line with the constant comparative principle that defines grounded theory methodology, data was collected in multiple waves. Four initial participants were recruited into the study and initial interview, food diary and follow-up interview data was collected for each. Data from these initial participants was examined with the goal of refining interview questions to more systematically tap emerging theoretical constructs. At the completion of data collection for initial four participants, phase two of data collection commenced. During phase two, participants were selected based on emerging theoretical constructs. Because sample pool was large (122 interested participants), invited participants could be purposively selected based on underdeveloped aspects of emerging theory. Theoretical sampling is another hallmark feature of grounded theory methodology (Charmaz, 2006). During phase two, additional participants were initiated into the study on an ongoing basis and all three components of data collection (initial interview, food diary, follow-up interview) for all phase two participants took place concurrently over a five week period.

During each phase of the study, initial data analysis was taking place simultaneously while data was being collected. This was achieved by listening to audio recordings of each interview multiple times during data collection phase and documenting emerging theoretical ideas in memos. Memoing is a critical aspect of the grounded theory methodology as memos "help to map out the emerging theory, and are used to identify concepts and their properties" (Goulding, 2002, p. 65). Glaser (1978) notes that memos are a defining feature of the grounded theory methodology.

At the conclusion of the 17th follow-up interview, category saturation was deemed to have occurred. Credibility in qualitative research can be derived from a data set that reflects the dimensionality of the constructs that make up the eventual theory that emerges. In order to represent the full dimensionality of constructs, it is recommended that the researcher sample until category saturation has occurred (Strauss & Corbin, 1998). According to Strauss and Corbin, category saturation has occurred when "(a) no new or relevant data seem to emerge regarding the category, (b) the category is well developed in terms of its properties and dimensions demonstrating variation, and (c) the relationships among categories are well established and validated" (p. 212).

At the conclusion of data collection, interviews were transcribed using MS Word and imported into the software program Atlas.ti for analysis. Data analysis began by reading through each interview transcript to obtain a holistic sense of data overall (Thompson, 1997). Next, four initial interview transcripts, representing a diverse subset of participants, were open coded to allow data to inform coding categories. Open coding was initially guided by a theoretical search for 1) behavioral factors associated with discard 2) cognitive processes associated with discard and 3) strategies and tools used to determine appropriate quantity of food to acquire, prepare,

serve and consume. These guiding categories were meant to impose some theoretical boundaries on initial open coding stage to help manage the quantity of codes that emerged. These boundaries were derived from the research question guiding this study. During data analysis phase, food diaries were not analyzed in connection to interview transcripts, but rather were examined in totality for emerging consumption and discard patterns across all participants. Grocery store purchase receipts were not analyzed beyond their use as memory recall prompts during both stages of the informant interviews.

Similar data units that emerged in open coding were clustered and labeled and labels were grouped into concepts. Concepts were evaluated for their interrelationships and ultimately extracted into categories and subcategories (Goulding, 2002). Subcategories were used to generate a selective code book designed to elucidate the dimensionality of emerging "core concept" or story (Goulding, 2002). Code definitions were developed to ensure that codes were capturing discrete units of information within data. Final code categories included items like: "planning", "shopping", "cooking", "eating", "discarding" and "inventory management" and codes included items like: "routines and patterns," "decision aids," and "menu planning" under the category called "planning." Finally, in the axial coding phase of the project, all interview transcripts were selectively coded. The four initial transcripts that were open coded were recoded during axial coding. A code called "other" was maintained to capture data from subsequent interviews that did not fit within existing codes.

Once all transcripts had been selectively coded, code reports were examined so that data supporting each category of information could be re-examined as abstracted units of data. From this abstracted data, the emerging theory was refined, negative cases were assessed (Lincoln & Guba, 1985) and supporting evidence was evaluated. A distinct feature of grounded theory

methodology, in comparison to most other qualitative methods, is the allowance for "a much wider range of data, including company reports, secondary data and even statistics" to help inform the emergent theory (Goulding, 2002). As the goal of grounded theory is interpretation, rather than just description, the researcher is also encouraged to bring intuition and relevant expertise to bear on ultimate development of theory (Goulding, 2002).

6. Discussion of Findings

The existence of food waste is a bit of a conundrum. In addition to substantial costs to society (Hall et al., 2009), wasting food is expensive for households (Buzby & Hyman, 2012) and produces psychological discomfort in most consumers (Quested et al., 2013). In spite of these negative consequences, a large proportion of the potentially consumable food that enters households across the developed world ends up in landfills and consumers do not appear to become more efficient in their utilization of food as they age (Quested et al., 2013). At first glance, wasting food seems like an irrational behavior. Through analysis and interpretation of in-depth interviews and food diaries, findings from this study suggest that wasting food may in fact be an adaptive behavior. To unpack this assertion, a model proposed by Bawa & Ghosh (1999) for understanding the full costs associated with provisioning a household may be useful. The purpose of discussing this model at this stage is not to provide a guiding framework for analyzing data but rather to supply a useful way of organizing study findings in an integrated manner. According to this model, total shopping costs are a function of cost of goods, costs associated with travel to the store (travel costs and opportunity costs associated with time spent shopping), and costs associated with holding inventory (opportunity costs associated with both tying up capital and utilizing physical storage facilities). As these authors note, a rational

decision making strategy would suggest that consumers determine the appropriate shopping frequency by optimizing the trade-off between the expenses of travel and inventory storage costs. These two costs are opposing because the less frequently one shops, theoretically, the more one must hold in inventory to meet the same consumption needs, and vice versa. This evaluation implicitly assumes that cost of goods will be the same no matter what shopping frequency is selected. In making this assumption, however, this model fails to account for the perishable nature of food and the impact both shopping frequency and inventory storage can have on quantity of goods required when a portion of inventory is consistently wasted.

Study findings can be usefully grouped around four main conclusions organized loosely around this total shopping cost model. They are: 1) people evaluate cost of goods based on incomplete value estimations that fail to account for the costs associated with discarding potentially edible foods; 2) costs associated with the act of shopping are salient and encourage less frequent provisioning trips; 3) people do not adequately account for costs associated with overbuying and storing food; and 4) strategies designed to maximize efficiency in food acquisition by enabling less frequent shopping trips may actually result in increased inefficiency in the form of greater waste and higher overall expenditure on food.

6.1 Neglecting the Costs of Discarded Foods

6.1.1 The saliency of grocery expenses.

During interviews, it was clear that most participants were sensitive to the financial expense of procuring food. Cost of goods was highly salient for most, and money came up regularly in conversations. This is not surprising, given that paying for groceries requires an

exchange of currency for food and most people participate in these unavoidable transactions multiple times a week. In conjunction with discussions about the expense of shopping for food, many participants discussed strategies they engaged in to lower their overall grocery bills. Jane, a single mom who works as a school teacher shared that she saves money by watching the weekly sales in the circulars and "if something's on sale at a particular place, I'll note that and go there to get [it]." Several participants, from a variety of income brackets, mentioned financial stress associated with food shopping, and their adaptive behaviors to cope with limited incomes. These included shopping immediately after payday, shopping at low-priced retailers like Walmart, shopping sales, stocking up on sale items, bulk buying at warehouse stores like Costco, participating in store "ad-match" programs, and using coupons. Cheryl utilized many of these strategies and shared that: "I try to do big shops, just when we get paid, because money, we don't have it in abundance.… We try to go to the grocery store right away—that way, we know we have food." For some participants, the overall cost of food was less of a concern, but costs associated with particular items impacted their willingness to make purchases. For instance, Mary said she won't buy the organic meat at her natural food store because "it's so pricey." Zach, a full time student, commented that he no longer buys out of season raspberries for $5 a carton. Overall, it was clear that many participants dedicated substantial time and cognitive attention to keeping their grocery expenditures in line with their perceptions of affordability.

This motivation to spend less on groceries was interesting because in seemed unconnected to attempts to measure actual expenditures. In fact, while a few claimed to have tracked food expenses at various times in the past, no one in this study currently had a budget or tracked monthly food purchases against a reference goal. Cheryl, the woman who shops right after payday to ensure she has enough money for food, represented a typical attitude toward

budgeting. She shared that: “I don’t have a budget; it’s just kind of whatever I think we need at that time.” Others aspired to keep track of monthly expenditures, but weren’t living up to their ambition, like Erin who explained: “I would like to keep our grocery budget tighter than I do, but right now, I just make our list and buy what we need.” Kyle was the most surprising in his assertion that he didn’t have a food budget because “it’s not easy to track,” given that he and his wife had previously engaged in “extreme couponing” which often took up their entire Saturdays as they shopped at multiple stores for specific deals that his wife had researched earlier in the week. He also mentioned several times that food expenses were a major concern in his household.

The discrepancy between participants’ sensitivity to spending money on groceries and their (lack of) awareness of total expenses related to food was puzzling. Yet, this focus on the little picture while overlooking the big, was also understandable. Tracking grocery expenses is actually quite complex. In a panel study of shopping trip records from nearly 1,500 households across three U.S. markets over a one-year period, Bawa & Ghosh (1999) found that the average shopper visits the grocery store 2.09 times a week spending over $26 per trip. Similarly, in a study of Swedish consumers, Mägi (1995) found that 84% of shoppers in her survey visited the store 2 or more times per week (as cited in Dahlen & Lange, 2002). In the present study, average expenditures weren’t tracked, but participants claimed to visit the grocery store on at least a weekly basis with most claiming to make additional trips during the week for replenishments. In a one month period, this means the average American consumer visits the grocery store almost 10 times. Assuming that people can document or remember total shopping expenditures from all ten trips (which may be unlikely, given research on working memory limitations, Anderson, Reder & Lebiere, 1996), determining monthly grocery expenditures is not as simple as adding up

a month's worth of receipts. One reason for this difficulty is the fact that in some households in this study, different members shared the task of food shopping. In these cases, multiple individual's receipts would need to be merged at the end of the month for an accurate tally of total grocery spending. Further complicating the budget tracking process, many stores sell more than just food. As Cheryl noted, "because I do go to Walmart, I end up getting things that aren't food, and so that changes the bill, because I'll get diapers, then I'll remember I need socks, or we need body lotion." Kyle explained that his desire to track food expenses was thwarted by the fact that he purchases human food for his dogs which greatly inflates his overall grocery bills.

Although software programs can automatically download and categorize monthly grocery expenditures, they typically can't identify which items on a receipt should count toward a food budget, which items are intended for a pet and which should more accurately be labeled as a clothing expense. For consumers in this study, the effort involved in tracking grocery expenses seemed to be a barrier to budgeting. This point was confirmed by several participants who said they had tracked expenses for a budget in the past. In each case, the person acknowledged that the work involved in keeping up with the budget was more than they wanted to do on an ongoing basis. For example, in talking about a year when she and her husband had tracked all household expenses, Sylvia said "Oh God, that was boring!" Given the general lack of motivation for tracking expenses, it is not surprising that these same consumers neglected to track the expense associated with discarding food. Tracking the value of discards as part of a holistic sense of the true price paid for food faces not only the hurdle of complex mental accounting, but also a barrier of recognition as calculating losses only heightens the discomfort of acknowledging wasteful behavior.

6.1.2 Waste aversion and cognitive dissonance.

Participants in this study were strongly averse to wasting food. This general finding was expected given normative social messages about efficiency and wise use of resources (de Coverly, McDonagh, O'Malley & Patterson, 2008; Bolton & Alba, 2012) as well as prior research findings that a majority of UK consumers dislike wasting food (Quested et al., 2013). As Doron (2012, p. 6) reports, "there is something about food waste that intuitively troubles us." In the present study, Jane said she "hate[s] wasting," Rick said wasting food makes him "really mad," Neal said he feels "sadness," Sylvia called wasting "ugly" and Ella said she feels "embarrassed when I throw things out." Many of these comments were offered in response to general questions about shopping and cooking patterns and before any specific question had been posed related to discard behavior. Care was also taken in describing this study to limit participant awareness about focus on food waste so as to limit responses motivated by social desirability bias (Grimm, 2010). Toward the end of the first interview, participants were questioned about the origins of their distaste for wasting food and many recalled messages from childhood about the moral implications of throwing away food, such as Erin who recalled "knowing that there are people who are on the other side of the world starving." Neal, on the other hand, acknowledged that the global food system is complex and that his guilt over throwing away food "has nothing to do with this idea that people are starving in Ethiopia" but that he "just feel[s] like wasting is a crime." A few participants even had concerns about the environmental impacts of food waste (but most did not, which conforms with UK research showing that consumers do not typically think about food waste as an environmentally impactful behavior, Quested et al., 2013). Representing an uncommonly broad awareness of the resources that are wasted when food is discarded, Zach said that:

> not only is it generating more trash that's going to end up in a landfill somewhere, [but] all the way up the chain, not only were there more water resources that went into growing that food…but… there's all of the [other] resources [that went] into actually growing the food and transporting it and distributing it.

An unexpected, but not totally surprising finding from this study was that most people felt they were less wasteful than average and that they held a stronger distaste for waste than peers (this may be similar to research, reviewed by Dunning, Heath & Suls, 2004, that shows that a majority of people believe themselves to be above average in general, a mathematical impossibility summarized as the overconfidence bias).

At whatever point in their interview participants brought up their aversion to wasting food (and almost all did at some point), I always followed with a straightforward question about why they disliked the practice. It was clear that most participants were highly attuned to the discomfort of throwing "money down the drain"[2] in the form of discards. Financial loss associated with food waste was clearly the most concerning aspect of discarding food for almost all participants. This finding conforms with prior research conducted in the UK showing that "saving money" is the most powerful motivating factor in consumers' efforts to avoid wasting food (Brook Lyndhurst, 2007; Graham-Rowe et al., 2013; Quested et al., 2013). As Erin explained, "it gets really expensive to just start throwing all that stuff out." In response to a question about why he "hates" throwing food away, Kyle said: "I feel like I'm throwing away money. You know, good money was spent to purchase that food, and if you don't consume it, then you wasted money, and that's a precious resource in my house right now." Responding to a similar question, Linda shared that "I just don't like wasting money," Nora said "I think it's mostly just [the] waste of money" and Rose said her concerns about wasting food were "probably mostly financial." As each of these quotes came from initial interviews, they seemed

[2] From interview with Cheryl.

to reflect a general aversion to the idea of wasting money and food. In second interviews, more specific conversations took place around actual food discards from diaries and people were generally less concerned about the value of the food being thrown away. As Rick explained, "[throwing away food] happens" and when it does, "I don't worry about it too much." In some cases, the cost of the specific item being discarded was deemed to be trivial, like when Sara shared that because she got salad greens at Costco that cost "$3.50 or something," discarding a portion that went bad wasn't "a giant financial commitment." She speculated that if she had purchased them at "other stores [where they] are $2.50 or $3.00 apiece [for much smaller containers]… that would be a concern." In fact, based on questions posed to other participants, even higher dollar food discards were likely to be justified as an inevitable cost associated with food provisioning if they were considered at all. When asked if she calculates the costs associated with discarded food, Mary said: "no, I think that would be too discouraging."

In spite of strong and universal discomfort with throwing away food, according to diaries, everyone did discard food. This scenario – continual participation in an activity one has a stated aversion toward – is a prime example of a conflict between belief and actions that is likely to produce cognitive dissonance (Festinger, 1957). Individuals seek to reduce their experience of dissonance and are motivated to avoid situations and information that lead them to experience increased conflict between beliefs and behaviors. In this study, participant strategies for reducing dissonance emerged as people attempted to minimize discomfort around their own wasteful behaviors. These strategies centered around minimizing and justifying waste on an item-by-item basis. For instance, when questioned about a specific discarded item from her food diary, Erin explained, "it happens from time to time [and] I don't get too bent out of shape about it." An example of justifying waste came from Nora who wrote out an explanation on her food diary for

why "[her husband's] leftover hummus" had to be discarded because "he ran out of vegetables to eat with it."

Others minimized their dissonance by attempting to eat unwanted foods. Even if the unwanted item was ultimately discarded, effort toward salvage seemed to make the experience more tolerable. Cheryl had a can of Italian wedding soup that she threw away one day. In explaining her decision to discard it, she said:

> I knew, when I put it in my little container, that I did not want to eat that, and so I put it in the container and I brought it to work, but I went ahead and ate nothing rather than eat that, because I just didn't want it and I threw it away. I knew! I knew very well in the morning that I didn't want it. So that was almost my way, I guess, to just get rid of it without just throwing the can away.

In a similar incident, Erin shared a story about a pie recipe that she'd recently tried that didn't turn out well. She shared that "we ate it for good sport and then we threw the rest out because it just wasn't good, and I knew that we weren't going to eat any more of it." Rick agreed that "in the end, if I can't make it taste good, I throw it away." Erin, Mary, Suzy and Rose all admitted that they tend to let unwanted food items "go bad in the fridge."[3] Erin explained this strategy in this way: "I usually will stick [unwanted food] back in the refrigerator in the hopes that someone else will eat it, and I guess by someone else, I mean my husband." Watson and Meah (2013, p. 110) note that in many cases, "matter becomes waste through the moment of disposal rather than as a consequence of its innate material properties." In this way, allowing an item to deteriorate in the refrigerator can diminish guilt associated with discard by more clearly demarcating it as garbage and turning the decision to discard into a prudent concern about food safety. It may also prolong the possibility of consumption and delay the transition from a cost (with future consumption possibilities) to a loss. Mary explained that "it just doesn't seem quite as much like

[3] From interview with Rose

I'm wasting it if I sort of [keep it in the refrigerator until it goes bad]" because "maybe I'll think of something else to do with it." She also shared that "if I'm in a restaurant and I didn't love what I had but there's a lot of it left on the plate … I'll get the leftovers and take them, [even if] I throw [them] out as soon as I get home." In his ethnographic field study of British consumer's food waste routines, Evans (2012) found a similar pattern of temporal delay in discarding unwanted food. As he notes, "whilst the vast majority of surplus food ended up in the bin, it was rarely put there immediately" (p. 46). From reviewing food diaries, it also appears that some people minimize the negative experience associated with throwing away food by discarding items in bulk. Though it may be that it is just convenient to clean out the fridge all at one time, it is also likely that this strategy minimizes the negative feelings associated with discarding food by aggregating them into one experience (Thaler, 1999). It may also be that the negative emotions associated with discarding food are offset by positive emotions associated with having a cleaner, less cluttered fridge.

In some cases, people simply failed to notice certain categories of food discard as waste. In separate studies with US and UK consumers, both Jones (2005) and Quested et al. (2011) reported that people chronically underreported their food waste. In this study based on self-reported diaries, validating that someone documented all discards was impossible, however, I did ask people questions about certain categories of discard in cases where I suspected that items may have been overlooked. For instance, Cheryl had a one year old daughter, but her food diary did not include any food items from her daughter's plate at night. I asked if she and her husband tended to finish her daughter's leftovers at dinner and she said: "good point, I missed all that…I guess I didn't think to add what we've thrown away for her." Similarly, several people neglected to account for uneaten food consumed outside of their homes, at restaurants, for instance.

Finally, for some, negative feelings associated with throwing away food were diminished because they found good use for their unwanted food. This was particularly true for Linda who explained that "anything that goes [bad] in the fridge, the goats or the dogs will eat." Similarly, Mary "started a compost heap a couple of months ago" that has caused her to scale back on her produce buying because seeing the material pile up in her compost heap made her realize she'd been "overambitious about how much produce [she] was buying." She said she enjoys having the compost heap "because [discarded food] is not wasted anymore." When asked about whether he perceived there to be any environmental consequences associated with food waste, Neal said, "no, because we compost it, so I'm not overly concerned about the waste… I'm probably more concerned about the space that the packaging takes up—like bags and containers—than I am about the actual food."

Similarly, a few people seemed to limit their experiences of cognitive dissonance by donating their unwanted food to others, like Suzy, who systematically donates her backstock every December. Others seemed to alleviate some guilt by considering the possibility of donating, even if the likelihood of actually donating was slim. Cheryl shared that, "if I notice things are about to expire and I don't think I'm going to eat it in that timeframe…if I can donate or something like that, [I will], because I don't want it to go to waste." She later acknowledged that more often than not, "I'll pick things up and realize why I haven't touched that in so long, it's expired." It seems that the *possibility* of donating an item may alleviate guilt associated with noticing items in inventory that don't ever seem to be selected for use, even if they never actually make it to a donation drop-off.

Overall, people in this study seemed to systematically neglect the cost associated with foods they ended up discarding. On the one hand, this was surprising because people were

sensitive about the cost of food and many claimed to be striving to spend less overall. On the other hand, the complex tasks associated with mentally calculating that portion of cost that can be attributed to discarded items makes accounting for the price of waste unlikely. Given that consumers in a field study were unable to remember the price of an item selected at the grocery store a mere 30 seconds after placing the item in their cart, the first hurdle in calculating the cost of discards would be knowing the price of the item when it was new (Dickson & Sawyer, 1990). In light of the fact that most people found the comparatively more straightforward task of tracking explicit expenses for a budget to be unreasonably effortful, tracking discard expenses seems highly improbable. In addition, the act of justifying losses served to minimize people's recognition of their wasteful behavior. While these justification strategies are helpful for reducing cognitive dissonance, they serve as an additional barrier to accounting for the cost of wasted food.

6.2 The Work of Grocery Shopping

6.2.1 Choosing where and when to shop.

While overall costs associated with wasting food were discounted, costs associated with acquiring food were substantial and salient. It turns out that for most consumers, grocery shopping is quite taxing (in fact, it is one of the top five most time-consuming household tasks, according to Coltrane, 2000, in his comprehensive review article on household labor – food preparation and cleaning up after meals were also in the top five). To begin with, significant cognitive attention is devoted to decisions made in the course of preparing to go grocery shopping. This was true even for the "non-planners"[4] in this study. As Mägi (1999) notes, for

[4] Here, "non-planner" refers to participants who scored fewer than 21 points (the median split) in their summed "total planning score" in the screening questionnaire. This score was derived from adding scores on all 7 planning

shoppers without a grocery shopping routine, an initial decision must be made about whether to shop or not. For consumers who shop every Saturday, as several in this study did, this initial decision has already been determined but a decision about where to shop may still loom – a question that is not as simple as it might seem. Every single participant in this study was shopping at multiple grocery stores each month, with some frequenting as many as five different stores on a regular basis. Kyle is a good example in this regard; he explained that "Costco is a staple, but then for special items, we will go to Fry's, Safeway, and Walmart… In any given month, we'll hit all those stores multiple times." In data from 1,500 American shoppers, Bawa & Ghosh (1999) found that 29 percent of shoppers patronized more than seven stores each year, 47 percent visited between four and seven stores and 24 percent shopped at fewer than four stores in a one year period. In the present study, different stores were visited for different reasons including product selection, price, sale items and location. Engel, Blackwell and Miniard (1995) note that in addition to these criteria, consumers may factor personnel and store services into their patronage choice.

Amongst participants in this study, Greg said he shopped at one local store because "coffee is cheap" and another "little Middle Eastern grocer that has lots of greens and vegetables and stuff that's by my house." Mary preferred to shop at a natural foods store near her house for most items, but during lean times, she tended to frequent Target because "the food at Target is really cheap." Rick had several stores he visited including Fry's and Walmart for produce, Trader Joe's for a particular brand of gluten-free bread and Costco for salmon and chicken. Sylvia, who claimed to really dislike Whole Foods, went there every weekend anyway because they are the only store that carries her preferred brand of organic milk and the frozen

---

behavior items. "Planners" refers to those participants who scored more than 21 points on their summed "total planning score".

blackberries that her husband uses for his morning smoothies. It was not uncommon for participants to have one list of weekly items that were acquired from one store and another list from another. Linda shared that: "I have a thing on my fridge, and every time [something I need] comes to mind …, I'll put the store name and what I need, because I know where I've got to get it." It was also not uncommon for consumers to sale shop at one store followed by sale shopping at a different store with a different selection of sale products. Kyle noted that "we're really fortunate that in [our town], we have a Fry's, Safeway, and Walmart all really close to one another so we can hit all three stores [during one shopping trip]."

In his book, *The Paradox of Choice*, Barry Schwartz (2004) argues that infinite choice can actually lead to less satisfaction amongst choosers. In part, this is because consumers' expectations are inflated by the presence of a large choice assortment. With many options to choose from, there is a possibility that some existing choice combination might be perfect and consumers are under increasing pressure to discover their ideal customized choice combination. The heightened effort and involvement necessary to acquire the perfect combination of consumer goods is often underestimated by consumers who prioritize the benefit of having a more preferred selection of items. This underestimation of costs associated with search and acquisition was evident amongst grocery shoppers in this study. Not only did nobody articulate regret about their patronage of multiple grocery stores but several called it good fortune to live in a metropolitan area with many food markets to choose from (like Kyle's quote above about having three stores in close enough proximity that they can all be shopped during the same trip). In many ways, it *is* fortunate to have so much selection. Where previous generations of consumers might have been stuck buying bland white bread at the neighborhood grocer, today a plethora of bread options exist at an array of supermarkets and specialty food shops. Rick shared that his

neighborhood stores "both have good produce selections and they have good prices… [but] they don't carry the bread I eat [a high protein, low-carb loaf]… I go to Trader Joe's for that." Similarly, Suzy shared that she was "super psyched" when Trader Joe's started carrying her family's preferred brand of gluten-free bread because she had been making special trips to Sprouts for this one item. Finding preferred brands and products can clearly motivate consumers to add additional stores to their monthly shopping rotation. Circularly, shopping at multiple stores seemed to increase some participant's item level price sensitivity, thereby ensuring continued patronage at non-neighborhood stores. The price of salad greens at Costco, for instance, made Sara's other supermarkets' prices seem exorbitant and made her reluctant to buy a "pillow of salad" anywhere else. In an opposite way, Mägi (1999) found that price sensitivity drives consumers to frequent multiple stores.

With many products and stores to choose from, consumers in this study were able to maximize their selections of preferred product, and in many cases, obtain cheaper prices in the process. Neal summed up his lack of loyalty to any particular store by explaining that "I don't have a go-to grocery store for everything because no one grocery store suits all my needs." Yet grocery shopping routines are inarguably more complex as the decision about *where* to shop has been added to the decision about *when* to visit the store. A part of this added complexity is that many preferred stores in this study were specialty stores with only a couple of locations spread across the metropolitan region. This means a trip to one of these stores requires more time and gas compared to a trip to the neighborhood supermarket. Though no one explicitly mentioned the increased cost associated with travelling to a store outside the neighborhood, many people alluded to these heightened costs by talking about their efforts to combine errands and shop when they were already in the area of the store in question. Rose noted that her preferred grocery

store, the one that "generally has cheaper everything" is "further away from home" and she typically only goes on days when she works at her part-time job. Neal shared that "Trader Joe's is near the gym that I go to." This is consistent with Mägi's (1999) findings that among 368 Swedish shoppers surveyed, only 53% had the same preferred store and primary store and only 38% described their closest store as their preferred store.

6.2.2 Choice overload.

Interestingly, while no one regretted the increased choice of stores to patronize, several expressed dissatisfaction with the size of grocery stores and the number of product choices that were available within. When asked why she preferred shopping at Trader Joe's, Suzy didn't hesitate before replying, "smaller stores." She explained that "when my daughter… was young … the fluorescent lights in the larger stores just made her crazy… So it was always nice to bring her in [to Trader Joe's] and have it not be so crazy." For others, the prospect of choosing from amongst the wide selection of options available at most grocery stores was simply difficult. Nora said the challenge of choosing items without a plan led her to develop weekly menu plans and then ultimately to subscribe to a paid meal planning service. She shared that: "I'm not the kind of person that can just go to the store and just randomly pick stuff. If for some reason I don't have time to pre-prepare my list, I'm more likely to buy pre-prepared meals." Rose shared that she feels:

> There's too many choices… sometimes the grocery store is overwhelming. I spent a couple years in France in my 20s, when I was learning to cook, and it was very simple there. I don't know; I had no real experience in the US to base it on, so all my learning was there, and we went to fresh fruit markets and all that. When I came back to the US after two years, the grocery stores were unbelievable—the choices. I mean, there's a

> whole aisle of cereal. How can you make a decision? … We have way too many choices in this country, I really think, and making choices all the time, it's like a constant thing—you're choosing traffic, you're choosing, you know, gas stations, you're trying to … I don't know. And so food is just like, 'Gee, one more thing I've got to make a decision [about]'.

6.2.3 Planning what to buy.

In addition to determining where and when to shop, grocery purchasers must decide what to buy. Planning seems to fulfill a dual role of ensuring that important items aren't forgotten and reducing the likelihood of buying unplanned items on impulse. Almost every participant confessed to using some type of list making strategy before heading to the grocery store. Many shared Neal's sentiment that "I don't like going into a grocery store without a list." For some, list-making was systematic and thorough in conjunction with weekly menu planning, like Erin, a "planner" who said: "I'm very detailed, and I have to have a list …. So I make the menu, and then I write my list." Kyle explained that:

> My wife is really organized, so we'll have this big old list of things that we need to buy, what stores have them on sale—[she uses a website that] will show you, 'This store has this thing on sale, and you can use this coupon from this insert to get it for x amount.'—So she has all these deals laid out, so what my wife will do is … she puts together the plan of action and then we will execute that plan on the weekend, and we'll do it together.

For others, like Neal, a low tech post-it note kept in a wallet was an adequate system, and Rick claimed to keep a pad of paper near his living room chair so he could jot down needed items while watching TV. Cheryl, a "non-planner" explained her planning process this way: "I make lists everywhere, and then I forget one or set it somewhere. So I end up usually making more

than one list." High tech shopping list apps were not used by many in this group, but Sylvia preferred making her list electronically because "I do this at home [on my phone] and I don't have to remember my paper list, which is often a problem." Still others created a mental list as they were preparing to head to a grocery store. Jane said that she kept a mental list but added "I usually have an ad with me, and I kind of star what I want."

As part of the list making process, many people engaged in inventory checking. This was one strategy for avoiding forgotten items. Dissatisfaction stemming from forgetting needed ingredients was primarily related to the fact that forgetting something often meant a planned or desirable meal option could no longer be made. In explaining his efforts to ensure that he always has chicken stock on hand, Rick said: "I'm going to make sure that I have enough to do it, [because] I don't like being in a situation where I need a braising liquid, you know? So I always like to make sure I have it on hand." He also shared that he "hate[s] getting up in the morning and not having milk."

In addition to the obvious inconvenience of not having a desired ingredient on hand, frustration around forgetting also seemed to relate to the subsequent implication that an impromptu shopping trip might be in order – now a three-part decision of whether, when and where to shop involving weighing of time and effort against importance of acquisition. Because people tended to follow a circuit, frequenting multiple stores each month, it could be a week or more before someone was likely to return to the store where the forgotten item was typically acquired and choosing not to make an impromptu trip might lead to a lengthy period of doing without. Linda shared that: "I hate to make random trips to a certain store, so I'll just wait until I need to [go back]." For most people, care was taken not to make spontaneous trips to the store to buy a single missing item. However, certain key ingredients would prompt an immediate trip in

spite of the effort involved (though sometimes to a less preferred but closer store). For Sara, half-and-half was typically the thing that prompted her to engage in unplanned shopping trips. Less critical missing items might just get worked around. Jane shared that when she is missing a needed ingredient, she tries "to improvise and make it work anyhow" like the time when she used sour cream in place of yogurt in a cake recipe.

To avoid forgetting, people invested different levels of time and effort into their inventory checking procedures. For some, reviewing inventory took place in their head as they compared their shopping list against their recollections of fridge and pantry stock. For Rick this was easy as he claimed to have a "near photographic memory." Emily claimed that "typically, I know what I have" but she did engage in physical inspection in cases where an item was infrequently used. Suzy, who no longer has time to make a comprehensive list said "I just look in the fridge and the pantry and decide, you know, just look and then go." Sara tended to be more thorough claiming "I look everywhere – I look in [all] my storage areas" before sitting down to make her shopping list. Rose was one of the most systematic. "Forget[ting] things every time," eventually led her to develop a monthly spreadsheet of all their needed groceries. With this system, she says: "I know how much I need for the whole month, and then I just track how far away [we are] from the end of the month, and I only buy that much, because I know at the beginning of next month, I'm going to buy everything again." Her tracking of inventory meant going into her pantry, with spreadsheet in hand, to physically count the quantity of various items to ensure adequate supplies.

For everyone, planners and non-planners alike, significant time, effort and cognitive attention was devoted to deciding what was to be purchased at which grocery store, and when. Due to general busyness and a lack of time in people's lives, most expressed an unwillingness to

spend more time than necessary grocery shopping. In addition, few people admitted to enjoying the experience of visiting the grocery store. Jane avoided shopping as much as possible saying: "I don't always go to the grocery store, I kind of just go through the stuff I have and then use it up." Sara said she's: "not interested in going to the store every day or every other day – it makes me crazy." Rose shared Sara and Jane's distaste for grocery shopping saying: "grocery shopping, to me, is a chore. I don't really enjoy it—I just wanna get in, get out, and have everything I need. And to me, there's this … somewhere, there's this magic formula that will give me that, but I haven't found it yet."

Though nobody complained overtly about the complexity built into their grocery shopping routine, collectively it does seem that this group of shoppers was struggling with the tension inherent in, on the one hand, seeking out the cheapest and/or most preferred choice set from multiple retail outlets, and on the other, minimizing time and effort spent shopping for food. After all, the only reason so much planning and menu projecting was required before heading to the grocery store is that most people were trying to buy enough food to last their household for a week of meals[5], a strategy that Dahlen & Lange (2002) refer to as "stockpiling." One reason that many were trying to shop for a week of meals is that they were rotating their grocery patronage amongst an assortment of stores and so few *planned* to return to the same store multiple times in one week. The reason they were patronizing multiple food stores each week is because they believed that some stores were better than others on an assortment of shopping dimensions – price and product selection in particular – but no one store offered

[5] There was an exception to this weekly shopping schedule. Neal claimed that he preferred shopping every couple of days because he shared his refrigerator with a roommate and was conscious of not taking up more than his half. In addition, he claimed "it's hard for me to project out a week ahead of time or longer [to know what to buy]." Notably, Neal was a single man who worked 3 days a week.

everything they desired. Location and convenience seemed to be less important to many shoppers in the face of more ideal options elsewhere and as such, nobody was doing all of their shopping at a neighborhood grocery store. With so many variables to think through – what one needs, which store to get it from, how far away the store is from home or other destinations, and even whether someone else has a better sale price during that particular week – it is little wonder that participants in this study were attuned to the effort involved in acquiring food for their families.

6.3 Opportunity Costs of Buying and Storing Inventory

Given that people really do seem to prefer particular items from particular stores – like Rick who gets a specific type of bread from Trader Joe's – having so many store and product options does allow for optimizing on choices. However, because of the effort involved in seeking out the best products and prices, it makes sense to take advantage of the optimized choice set when one finds it. In this way, a strategic response to a complex grocery routine is to overbuy. Overbuying allows for the consolidation of grocery trips into as few outings as possible and it allows consumers to capitalize on effort spent finding the best deals. Almost everyone in this study was shopping with a weekly timescale in mind [see above footnote for an exception], however some had an even longer time horizon in mind. Backstocking, which seems distinct from more typical stockpiling (Dahlen & Lange, 2002) helped some participants prevent an 'out-of-stock' experience. Suzy, "keeps tons of cans and stuff in [her] pantry" with 5-6 containers of her family's commonly consumed non-perishables like peanut butter, refried beans, soup, and applesauce. By keeping these items on hand, she lessens the risk that she will run out of any of these critical foods. For others, buying in bulk was a great way to take advantage of sale prices

and save money on groceries. As Kyle explained:

> We do have an extra freezer in our kitchen …. and … a couple of weeks ago, Safeway had ground beef for two dollars a pound and it's the cheapest I'd seen ground beef in a long time, and we bought like 30 pounds of it.

For still others, keeping inventory on hand was a way to save time and effort in cooking. Linda had two "fridge-freezer combo[s]" at her house as well as a "chest freezer" in an outbuilding in her yard. She tries to do all her weekly cooking on Wednesdays and Sundays and said she usually has one freezer full of prepared foods like brown rice, meatloaf, breakfast burritos, hummus, homemade turkey burgers, and even cookies and cake.

In many ways, backstocking frequently used items, taking advantage of sale and bulk pricing, and cooking ahead to plan for busier times are sensible strategies for saving money, time and hassle. Few consumers seemed to recognize any of the costs inherent in holding inventory, however. Tangible costs include running extra refrigerators and living in houses with more storage space, and intangible costs include effort and organizational skill needed to ensure food gets eaten and doesn't go to waste. In addition, no participant mentioned opportunity costs associated with tying up capital in backstock. With significant household food inventory comes financial risk associated with unpredictable events, like an electricity outage. Though some who backstock – like Linda, who claims to have a 3-6 month food supply – do so in part to protect against an emergency supply interruption, the likelihood of loss due to routine electricity interruptions or general neglect of forgotten about inventory seems more likely in the United States, than disruptions in city-wide grocery services. In addition, purchasing in quantity can make a shopper more vulnerable to irregularities in stock. Linda shared an example of a time when her family had to throw away a whole "half a beef" [around 100 pounds of meat] because it "taste[d] funny." She and her husband had purchased beef in bulk from a local processor and

claimed there was something off about the particular cow acquired. In the end their effort cost them a lot because a whole freezer's worth of inventory had to be thrown out. In addition, attempts made to save money by bulk buying can end up costing money over time if food is discarded rather than eaten. Many people shared stories of attempts to buy in bulk at Costco that resulted in a large portion of the package going to waste. For instance, Cheryl shared a story about a time last summer when "we got this huge bag [of croutons] from Costco." Recently she'd discovered the nearly full, expired bag in her pantry. Upon reflection she exclaimed: "we like salad, but my goodness! This thing was so big." In some cases, tossing parts of a Costco purchase was just accepted as part of the process. Kyle said that he regularly buys a package with "five heads of lettuce in a thing and maybe one head of lettuce doesn't get eaten, and it'll be tossed."

6.4 Maximizing 'Value'

In examining the contribution of each facet of Bawa & Ghosh's (1999) model to total shopping costs, it can be helpful to imagine a scenario in which each individual cost is eliminated to assess the resulting impact on the remaining cost facets. For example, in a scenario in which costs associated with holding inventory were minimized, the individual would likely have to shop on a daily basis. In order to minimize inventory holding costs, a home would have to go without a refrigerator or extra space to keep pantry items. Though this situation sounds improbable, it is not far removed from living situations in some developing nations in which houses are small and electricity unreliable. In such a situation, people shop at the market for their immediate consumption needs. As a result, they may pay a slightly higher price for goods because they cannot buy in bulk and they may spend more time engaged in procuring food

because shopping is taking place on a daily basis. At the same time, they are unlikely to discard usable food because they are shopping with immediate consumption in mind and so predicting future needs is unnecessary. Equally relevant is the fact that they can more accurately gauge the correct amount of perishable food to purchase based on their immediate level of hunger and the appetites of other members in their household. Indeed, analysis of food losses in developing nations show that a majority of losses take place within the supply chain because of inadequate transportation infrastructure and lack of cold storage chains, not in the hands of consumers (Parfitt et al., 2010).[6]

On the other end of the spectrum, imagine a household that wanted to minimize shopping trips (and shopping costs) and as a result, large quantities of food are kept in reserve to meet future consumption needs. Though such a scenario is hard to imagine in our modern era, it is not unlike previous eras when people "put up" the summer's harvest to be eaten throughout winter. One obvious impact of this strategy is that variety is restricted and inventory on hand may not always correspond with immediate hunger and appetite. Another is that effort must be exerted to manage inventory. Inevitably, with perishable inventory in storage, some will be discarded due to spoilage and misalignment with current preferences. With large quantities of inventory on hand, a household is vulnerable to error and financial misfortune. If a year's worth of beef spoils in the freezer during an electricity outage, the household will likely spend a great deal more replenishing stock than they saved from buying in bulk. At the same time, no ongoing resources need be spent shopping for or acquiring food.

Most Americans would object to either of these extreme scenarios. Modern grocery stores allow consumers to select fresh produce throughout the winter and people are not forced to

[6] Though the cost of food in relation to income in developing nations is surely a factor in consumer-level efficiency as well.

commit to a season's worth of inventory in advance. Reliable electricity, refrigerators and adequate pantry space allow people to stock up on good deals and keep regularly consumed staples on hand so that they don't have to visit the store every day. As this thought exercise shows, however, holding inventory does increase the cost of consumed food because of the inevitable losses that come with keeping perishable goods on hand for future consumption. As Buzby & Hyman (2012) found that the average American household discards $936 worth of food each year, neglecting this cost is not trivial (it amounts to $18 of waste each week; enough to buy 5 gallons of milk, 3.5 lbs of coffee or 9 dozen eggs according to the "Consumer Price Index," 2014). Therefore, a consumer who wants to get the most value for their grocery dollars might consider a shopping strategy that includes some holding of consistently used inventory combined with frequent trips to the grocery store. In this way, an individual might be able to buy a gallon of milk at a time and take advantage of the volume discount for goods that are used on a regular basis while simultaneously shopping for immediate consumption needs as appetites demand. Using this "value maximizing strategy" – where costs associated with discarding edible foods are considered – the consumer would be unlikely to purchase broccoli for dinner three nights in the future, but would instead visit the store on the day that broccoli was desired so as to prevent the possibility that plans or appetites might change or that the broccoli might spoil faster than expected. From participants in this study, it was clear that most were not employing this "value maximizing strategy" because the salience of grocery shopping effort, combined with underweighting of costs associated with holding inventory (including neglect of the value of discarded goods) led most people to shop less frequently than would be necessary to minimize production of waste. Considered in this way, the perceived efficiencies gained from shopping infrequently and holding inventory are likely to be partially offset by the inefficiency of wasting

potentially edible food.

In this study, several people were operating from the assumption that diligent planning might allow them to, essentially 'have it both ways,' that is, visit the store less frequently while simultaneously utilizing purchased food in a highly efficient manner. While it may be theoretically possible to find a perfectly optimized balance between shopping frequency and inventory storage so that store visits can be spaced out *without* increasing the volume of food lost, there are several reasons why recommending that consumers 'plan better' may not be an effective policy strategy for reducing incidence of food waste. First, not all consumers are prone to planning. In a study by Cobb and Hoyer (1986), three distinct categories of grocery buyers emerged – planners, partial planners and impulse shoppers, suggesting that for some, advice to plan more might be difficult or impossible to follow. Second, research has shown that over 50% of grocery purchases are actually unplanned (Stilley, Inman & Wakefield, 2010) which suggests that even planners make unplanned purchases on a regular basis. Furthermore, consumers have a difficult time projecting what they will want to eat in the future (Simonson, 1990; Read & van Leeuwen, 1998; Shiv & Fedorikhin, 1999; Gilbert et al., 2002; Loewenstein et al., 2003; Kahneman & Thaler, 2006). Given the challenges associated with effectively planning for future consumption, even the most rigorous planning routines may still result in waste (and indeed, those participants who engaged in thorough menu planning activities did discard some food).

A distinct subset of this participant group had discovered meal planning – the systematic selection of a week's worth of menus, often with corresponding recipes – as a way to increase their efficiency in food acquisition and utilization. While planners, overall, have been shown to be more prone to stockpiling and infrequent shopping (Dahlen & Lange, 2002), one advantage of systematic meal planning is that needed ingredients tend to be bought with short term

consumption needs in mind and fewer items are purchased to keep a generally well stocked pantry. This can lead to fewer discarded items down the road and also fewer "out-of-stock" experiences because specific ingredients are purchased with specific meals in mind. In addition, for consumers who subscribe to a paid menu planning service, as Nora did, following the recipes provided can cut down on leftovers and partially used ingredients. This is because an expert systematically puts together a week's worth of coordinating meals that take advantage of similar ingredients. If half a can of tomato paste is used in one recipe, a recipe several days later will almost certainly incorporate the remainder. In addition, recipes are designed to calorically feed a certain number of people. These food (and money) saving strategies are a part of the advertised value proposition that these services provide. Another advantage of meal planning, in general, is that participants who were committed to a planned menu tended to adopt a mindset that they would eat whatever their planned menu dictated, rather than relying on taste and appetite to guide their consumption preferences. Meal planners in this sample tended to feel that the convenience and reduction in stress was worth the reduced flexibility. Erin, who does her own planning, said she used to regularly stare into her cabinets trying to think of something to make while her one and three-year olds cried in the background. Finally, she said: "I just decided that was enough and I came up with a meal plan for the first week, and that was all that it took. And then it was just kind of a necessity." Rose, who used to subscribe to a paid menu planning service called the service "my lifesaver" and said that having "somebody email me and [say], 'here's what you're having for supper'…it was like heaven."

One downside of menu planning as a solution to the problem of food waste is that many participants were not interested in deciding (or being told) what they would eat days in the future. Kyle said that when he and his wife decide what to make for dinner, "it's very much just,

'What're we in the mood for today?'" Jane worried about the time involved in planning and shopping for menu plan ingredients. She said "I don't know that I'd have the time to go to the store and get those exact ingredients." Similarly, Suzy, a mother of three who works and goes to school full time, was "way too busy" to make a weekly menu ahead of time. These time concerns are well founded, as menu planning did require significant effort for those who did it themselves. Erin created a shopping list each week after painstakingly planning out 21 meals plus snacks for the coming week's menu. Linda shared that she often spent over an hour on Wednesday mornings creating her menu, scoping out sales and pulling her list together. Subscribing to a paid menu planning service eliminates a great deal of the planning work but adds expense and a less customized food experience. Linda shared her concerns that she wouldn't enjoy a paid service because "I don't know that I'm going to like what they like" and "financially too, is it going to be what I would spend on a meal?" Overall, it was clear from participants in this study that meal planning, and especially menu planning services, are likely to appeal to a subset of consumers. To meaningfully reduce food waste in American households, additional tools and strategies must be developed to help consumers temper their propensity to overconsume.

7. Implications

What do study findings mean for retailers, food producers and marketers? For one, participants in this study lend support to recent reports that traditional grocery stores face an increasingly competitive marketplace and may need to adapt to changing consumer shopping preferences (see Mitchell, 2014, for example). As participant data in this study shows, consumers are actively seeking out lower prices at big box retailers, better deals at warehouse stores and

higher quality goods at specialty markets. Though people did shop at traditional grocery stores, they were often not their preferred outlet. In addition, though traditional grocery stores clearly offer the widest array of products to choose from, the enormous selection seemed to be overwhelming for some. Interestingly, the extensive choice set at traditional grocery stores seemed to actually reduce consumer loyalty to these outlets because there was little to differentiate a particular grocery chain from all the others and many people switched between stores depending on weekly sales promotions. By contrast, the highly curated choice sets (including desirable private label goods) offered at specialty and warehouse stores seemed to engender loyalty, both to the store and to products available within these stores.

Looking forward, grocery delivery services offer an intriguing model that may appeal to consumers. According to findings from this study, delivery services may be tempting for consumers who are busy and overwhelmed by the task of provisioning healthy food for their families. Delivery services should consider highlighting the on-demand nature of their service as a means to reduce planning rituals tied to creation of a shopping list that will encompass a week's worth of meals. Amazon Fresh, for example, advertises that consumers can place an order by 10 a.m. to receive groceries by dinner time, or by 10 p.m. for delivery in time for breakfast (Fresh.amazon.com, 2014). The ability to make a mid-morning decision about what one wants to eat *that* night should appeal to many consumers. In order to avoid the effort of planning and executing a grocery shopping excursion, consumers might even be willing to pay a price premium, especially if it is charged as an annual membership fee such as Amazon Fresh's subscription dues (and therefore, decoupled from actual food prices). If grocery delivery services can devise effective advertising campaigns that remind consumers about the cost of discarding

surplus food, consumers may be more willing to pay a premium for on-demand food that reduces food waste.

A major advantage for grocery delivery providers is the ability to reach customers online and provide additional informational services at the point of purchase, such as personalized menu suggestions and shopping reminders. If an online grocery service made personalized grocery suggestions based on previous order history and preferences, consumers could invest less time in actively checking inventory (imagine a message that pops up on screen saying "you usually buy olive oil every five weeks and haven't ordered any yet today" or more generally, "you often buy these seven things, did you forget any of them in your order today?"). Potentially more helpful could be an à la carte menu planning service where consumers select a meal they'd like to have and all the ingredients show up along with a recipe that evening. Menu ideas might even be suggested based on perishable items the person has recently purchased that could still be sitting in the fridge. Looking to the more distant future, data from smart refrigerators could be set to automatically sync up with online ordering services to help suggest recipes that utilize existing inventory, especially items close to expiration, and remind consumers about soon-to-be-empty condiments and other refrigerator staples.

Another advantage of grocery delivery is the ability to combine orders of food with other household items, which taps into the competitive advantage that big box retailers now enjoy. In some ways, grocery delivery offers the convenience of daily shopping that corner food markets of previous eras might have enabled, with the expansive inventory choice set of a vast supercenter. For more price sensitive customers, online ordering with self-service pickup could enable some of the personalized shopping suggestions without the delivery fee. In addition, offering user friendly digital coupon management could attract some price sensitive shoppers.

Of course, grocery delivery runs the risk of a substantial environmental footprint if competing grocers are all operating separate fleets of refrigerated trucks driving around sprawling metropolitan areas each day. In this scenario, the decreased environmental impact stemming from more efficient use of food supplies would be more than offset by the increasing environmental footprint of daily delivery service traffic. As grocery delivery is still a young industry, there is a great opportunity for collaboration across retailers (possibly led by a third party delivery provider, such as UPS or even the USPS) to ensure that only one delivery truck is visiting each neighborhood every day (and possibly delivering packages or mail at the same time). Alternatively, advances in hybrid vehicle technology could reduce the impact of regular home delivery by relying on electricity generated from renewable sources. If grocery delivery can be implemented in a collaborative, resource-efficient manner, then the environmental footprint of food shopping might ultimately be lowered as consumers shop more frequently without concomitant increases in vehicle traffic, be they personal cars or competing retailers' trucks.

Some of the advantages offered by grocery delivery, such as menu suggestions, smart shopping recommendations, and seamlessly integrated digital coupon management could be offered by traditional grocery operations through beefed up membership programs that tie into smart-phone applications that consumers can run while shopping in store. Though these would not eliminate the consumer's need to physically shop at the grocery store, by taking some of the effort required to plan the grocery trip off of the consumer's shoulders (and even reducing the likelihood of forgotten items that require a return trip), a more advanced membership program could make shopping quicker, more efficient and useful enough to warrant more frequent trips to a preferred grocery purveyor.

Finally, the sharing economy may offer interesting opportunities for optimizing food utilization in the future. The sharing economy is "an economic model based on sharing underutilized assets … for monetary or non-monetary benefits." (Botsman, 2013). Inventory, in the sharing economy, is typically held remotely by users and technology platforms are enabling consumers to share assets in systematic and organized ways. Already, food sharing platforms have been developed to enable the redistribution of surplus farm harvest, like cropmobster.com, and leftovers, like leftoverswap.com and foodsharing.de (Braw, 2014). In this study, participants had a desire to donate goods before they spoiled, but in some cases, the logistics involved in finding a donation outlet thwarted donation intentions. A simple, neighborhood-based redistribution network could help consumers avoid some incidence of waste. More promising still could be sharing platforms that help neighbors to bulk buy perishable goods and split the cost. Many consumers in this study talked about buying perishable items at Costco that they knew they could not finish. If they could arrange to split a box of spinach with a neighbor, in a hassle free and socially acceptable way, that might be a useful service. Though informal buying cooperatives have existed for a long time, technology may offer ways to systematize ordering and expand the reach of these food sharing networks to larger and more mainstream communities of consumers.

8. Limitations and Future Research Directions

As an exploratory study, this research examined a small sample of consumer narratives in great depth. Since qualitative research is never generalizable, these research findings must be interpreted as the lived experience of a small group of American grocery shoppers. Through this

examination, a number of interesting questions emerged. Future research can follow up on themes from this study using quantitative methodologies and larger consumer samples. Several of the topics uncovered in this study seem especially well suited for follow up experimental work, including inquiries into the ways that consumers evaluate and rank costs associated with food provisioning and how they mentally account for these costs within contextually varied scenarios. In addition, a behavioral decision aid could be developed to help consumers quantify and track discards in an effort to see how measurement and data analysis might impact behavior. Furthermore, an experiment designed to manipulate choice options could explore impacts of shopping frequency on propensity to stockpile. Effects of pricing, promotional messages, planning routines and even kitchen design and layout on shopping behavior could also be examined.

Finally, the dearth of research documenting details of actual household discards in the United States, and elsewhere, is a critical area for follow-up study. In addition to a need for more peer reviewed studies estimating total food losses and monetary value of losses, there is also a need for more standardization in the ways that waste data is collected, classified and reported to facilitate more accurate comparisons across studies and nations (Buzby & Hyman, 2012; Lebersorger & Schneider, 2011). On the topic of food waste, residents of the United Kingdom seem to be the most examined with numerous reports and studies based on samples of UK consumers (see for example: BrookLyndhurst, 2007; Corrado, 2007; Bridgwater & Quested, 2011; Evans, 2011; 2012; Forsight, 2011; Quested et al., 2011; Graham-Rowe et al., 2013; Quested et al., 2013; Watson & Meah, 2013). This concentration of UK research is notable because an organization called WRAP (Waste & Resources Action Programme), which is funded by various governmental agencies from across the UK, began a program called “Love Food Hate

Waste" in 2007 that has produced substantial research on the topic of food waste prevention (including many of the studies cited above). In addition to providing valuable data about food waste behaviors and attitudes, they do substantial advocacy work which may be responsible for bringing general attention to this topic ("Love food hate waste"). The UK provides a salient example of the value of governmental investment in research on this important topic.

One significant limitation in this study that future research should address is the exclusive use of an urban consumer sample. All participants in this study resided in a large metropolitan area and had an extensive selection of grocery retailers, specialty markets, big box retailers and warehouse stores at their disposal. In addition to national chain stores, an assortment of locally owned food markets complemented the grocery marketplace in this area. Rural and suburban consumers may not have access to the same choice maximizing retail market space and some findings from this study may not be applicable to these consumer groups. Future studies should take care to include a mix of locations with diversity in population density and retail outlet offerings.

Another limitation is the utilization of informant interviews and self-report diaries without additional ethnographic participant observation to bolster findings. As Watson and Meah (2013) point out, personal narratives cannot fully capture the complexity of the participant's lived experience. To this end, a follow-up study aimed at observing participant shopping behaviors could be useful. Though ambitious in scope, documenting details about participant's comprehensive shopping behaviors such as store choice, shopping duration, itemized expenditures and then eventual use or disposal over time could yield additional insight and confirm findings based on participant recollections and self-reported diaries.

9. Conclusions

There is a popular narrative about American consumers that we are gluttonous and indifferent to the waste we create. We are said to live in a 'throw-away-society' where the pursuit of more and better goods leads us to ignore costs associated with disposing of the old (de Coverly et al., 2008). While the fact that so much food is wasted is evidence, to a degree, of the truth in this claim, the individual's role in waste production is complex. From participants in this study, it was clear that people are not indifferent to food waste (Evans, 2012, and Watson & Meah, 2013, reach similar conclusions based on their study participants). Though they may not have always recognized all of the waste that their consumption patterns created, participants were certainly not callous. Every single person expressed a strong distaste for wasting food, guilt about their own wasteful behaviors, and a general belief that he or she was making a better than average effort to be conscientious about utilizing foods acquired. In addition, people's concern about the financial losses associated with food waste made them open to basic strategies aimed at reducing the need to discard (again, Watson & Meah, 2013, found a similar pattern among their study participants – they conclude that thrift is a great motivator in people's attempts to reduce food waste). Participants in this study ate leftovers, they divided up bulk purchases and froze things for later use. Unexpectedly, they all reported willingness to eat marginally fresh produce when asked if they would cut bad spots out of vegetables or throw them away. Some of these reported behaviors were surprising, as I went into this study believing that individually wasteful practices, and an intolerance for less than pristine foods were likely the source of much of the discards. What I found, at the most basic level, is that household food waste happens because the modern American tendency to shop infrequently is at odds with basic human abilities to predict future food consumption needs. Essentially, participants' desire to stockpile groceries led to

adaptive overbuying and overbuying will always lead to waste. In this way, the present study serves to bolster Evan's (2012, p. 45) claim that the "mismatch" that exists "between the ways in which food is provisioned and the ways in which lives are lived results in the routine over-provisioning of food and in turn, its wastage." I argue that this mismatch extends beyond sociological constraints, however, to include the basic psychological inability to effectively forecast when it comes to food.

In this way, advice from the National Resources Defense Council to shop smart, be realistic about cooking quantities, freeze more and understand expiration dates (Gunders, 2012) may be less than helpful because in this sample, people were already doing these things to the extent that they were capable. The advice that might actually impact a consumer's level of discard is this: shop more. By shopping more often (and buying less on each trip), consumers can lessen their need to predict their appetite three or five days in the future. By buying food for a more immediate time scale, less cognitive effort is required to plan and also to manage inventory once it has been purchased. Unfortunately, the advice to 'shop more' is at odds with the choice maximizing preferences of modern consumers who expect to be able to customize their own ideal inventory choice set. In addition, as most Americans grocery shop by car, shopping more could result in increased car traffic which might offset environmental gains from more efficient utilization of food supplies. Perhaps widespread participation in [efficiently coordinated] grocery delivery services will enable consumers to shop more frequently, enjoy expansive choice options and reduce the environmental impacts of food provisioning.

References

Allen, M. W., & Wilson, M. (2005). Materialism and food security. *Appetite, 45(3),* 314-323.

Anderson, J. R., Reder, L. M. & Lebiere, C. (1996). Working memory: Activation limitations on retrieval. *Cognitive Psychology, 30,* 221-256.

Bentley, A. (1995). American abundance examined: David M. Potter's People of Plenty and the study of food. *Digest, 15,* 20-24.

Bawa, K., & Ghosh, A. (1999). A model of household grocery shopping behavior. *Marketing Letters, 10(2),* 149-160.

Bloom, J. (2010). American wasteland: How America throws away nearly half of its food (and what we can do about it). Philadelphia: Da Capo Press.

Bolton, L. E., & Alba, J. W. (2012). When less is more: Consumer aversion to unused utility. *Journal of Consumer Psychology, 22,* 369-383.

Botsman, R. (2013, November 22). The sharing economy lacks a shared definition [Web log post]. Retrieved from http://www.collaborativeconsumption.com/2013/11/22/the-sharing-economy-lacks-a-shared-definition/

Braw, E. (2014). Free lunch, anyone? Foodsharing sites and apps stop leftovers going to waste. *The Guardian.* Retrieved from http://www.theguardian.com/sustainable-business/free-food-sharing-leftovers-surplus-local-popular/

Bridgwater, E., & Quested, T. (2011). *Synthesis of food waste compositional data 2010* (Project code: EVA150-001). Retrieved from WRAP: http://www.wrap.org.uk/retail

Brook Lyndhurst. (2007). *Food behavior consumer research: Quantitative phase.* Retrieved from http://www.wrap.org.uk/sites/files/wrap/Food%20behaviour%20consumer%20research%20quantitative%20jun%202007.pdf

Buzby, J. C., & Hyman, J. (2012). Total and per capita value of food loss in the United States. *Food Policy, 37,* 561-570.

Camerer, C. (1999). Behavioral economics: Reunifying psychology and economics. *Proceedings of the National Academy of Sciences, 96,* 10575-10577.

Chandron, P., & Wansink, B. (2006). How biased household inventory estimates distort shopping and storage decisions. *Journal of Marketing, 70(4),* 118-135.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis.* London: Sage Publications.

Cobb, C. J., & Hoyer, W. D. (1986). Planned versus impulse purchase behavior. *Journal of Retailing, 62(4),* 384-409.

Coltrane, S. (2000). Research on household labor: Modeling and measuring the social embeddedness of routine family work. *Journal of Marriage and Family, 62(4),* 1208-1233.

Consumer price index : Average price data. (2014). In Bureau of Labor Statistics Databases, Tables & Calculators by Subject. Retrieved from http://data.bls.gov/cgi-bin/surveymost

Corrado, M. (2007). *Understanding consumer food management behaviour*. Retrieved from WRAP: http://www.wrap.org.uk/retail

Creswell, J. (2013). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches.* Thousand Oaks, CA: Sage Publications.

Dahlén, M., & Lange, F. (2002). Real consumers in the virtual store. *Scandinavian Journal of Management, 18,* 341-363.

de Coverly, E., McDonagh, P., O'Malley, L., & Patterson, M. (2008). Hidden mountain: The social avoidance of waste. *Journal of Macromarketing, 28(3),* 289-303.

De Martino, B., Kumaran, D., Seymour, B., & Dolan, R. J. (2006). Frames, biases, and rational decision-making in the human brain. *Science, 313(5787),* 684-687.

Dickman, P. R., & Sawyer, A. G. (1990). The price knowledge and search of supermarket shoppers. *Journal of Marketing,* 54(3), 42-53.

Doron, N. (2012). A clear plate means a clear conscience. In N. Doron (Ed.), *Revaluing food*. London: Fabian Society. Retrieved from http://www.fabians.org.uk/wp-content/uploads/2012/11/Revaluing-FoodWEB.pdf

Drewnowski, A., & Darmon, N. (2005). Food choices and diet costs: An economic analysis. *The Journal of Nutrition [Special issue], 135,* 900–904.

Dunning, D., Heath, C., & Suls, J. M. (2004). Flawed self-assessment: Implications for health, education, and the workplace. *Psychological Science in the Public Interest, 5(3),* 69-106.

Engel, J. F., Blackwell, R. D., & Miniard, P. W. (1995). *Consumer behavior.* Fort Worth, TX: Dryden.

Environmental Protection Agency. (2011). *Methane.* Retrieved from: http://www.epa.gov/methane/

Environmental Protection Agency. (2012). *Basic information about food waste.* Retrieved from: http://www.epa.gov/osw/conserve/materials/organics/food/fd-basic.htm

Escaler, M., & Teng, P. (2011). *Mind the gap: Reducing waste and losses in the food supply chain.* Retrieved from The Center for Non-Traditional Security Studies website: http://www.rsis.edu.sg/nts/HTML-Newsletter/Insight/NTS-Insight-jun-1101.html

European Commission. (2011, September 20). *Roadmap to a resource efficient Europe: Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions* (COM 2011 571). Retrieved from http://ec.europa.eu/environment/resource_efficiency/pdf/com2011_571.pdf

Evans, D. (2011). Blaming the consumer – once again: The social and material contexts of everyday food waste practices in some English households. *Critical Public Health*, 21(4), 429-440.

Evans, D. (2012). Beyond the throwaway society: Ordinary domestic practice and a sociological approach to household food waste. *Sociology, 46(1),* 41-56.

Festinger, L. (1957). *A Theory of cognitive dissonance.* California: Stanford University Press.

Foresight. (2011). *The Future of Food and Farming: Challenges and Choices for Global Sustainability (*Final Project Report). London: The Government Office for Science. Retrieved from http://www.bis.gov.uk/foresight/our-work/projects/current-projects/global-food-and-farming-futures/reports-and-publications

Fresh.amazon.com. (2014). Introducing AmazonFresh, available at: https://fresh.amazon.com/MembershipBenefits?pf_rd_s=slide-1&pf_rd_p=1769670062&pf_rd_t=101&pf_rd_i=1&pf_rd_r=0HSMV4MCJT6ZRQQ64RF4 (accessed on 2 May 2014).

Garrone, P., Melacini, M. & Perego, A. (2014). Opening the black box of food waste reduction. *Food Policy*, *46*, 129-139.

Gilbert, D. T., Gill, M. J., & Wilson, T. D. (2002). The future is now: Temporal correction in affective forecasting. *Organizational Behavior and Human Decision Processes*, *88(1)*, 430-444.

Glanz, R. (2008). Causes of food waste generation in households – an empirical analysis (master's thesis). Retrieved from Google Scholar.

Glaser B. G. (1978). *Theoretical sensitivity: Advances in the methodology of grounded theory.* New York, NY: Sociology Press.

Goulding, C. (2002). *Grounded theory: A practical guide for management, business and market researchers.* London: Sage Publications.

Graham-Rowe, E., Jessop, D. C., & Sparks, P. (2014). Identifying motivations and barriers to minimising household food waste. *Resources, Conservation and Recycling, 84,* 15-23.

Griffin, M., Sobal, J., & Lyson, T. A. (2009). An analysis of a community food waste stream. *Agriculture and Human Values, 26,* 67-81.

Grimm, P. (2010). Social desirability bias. Wiley International Encyclopedia of Marketing.

Gunders, D. (2012). *Wasted: How America is losing up to 40 percent of its food from farm to fork to landfill* (Research Report No. 12-06-B). Retreived from National Resources Defense Council website: http://www.nrdc.org/food/files/wasted-food-ip.pdf

Hall, K. D., Guo, J., Dore, M., & Chow, C. C. (2009). The progressive increase of food waste in America and its environmental impact. *PLoS ONE, 4(11),* e7940.

Halweil, B., & Nierenberg, D. (2011). *The state of the world: Innovations that nourish the planet.* Retrieved from The Worldwatch Institute website: http://www.worldwatch.org/sow11

Haynes, G. A. (2009). Testing the boundaries of the choice overload phenomenon: The effect of number of options and time pressure on decision difficulty and satisfaction. *Psychology & Marketing, 26(3),* 204-212.

Heath C., & Stoll, J. B. (1996). Mental budgeting and consumer decisions. *Journal of Consumer Research, 23(1),* 40-52.

Hertwich, E. G. (2005). Life cycle approaches to sustainable consumption: A critical review. *Environmental Science & Technology, 39(13),* 4673-4684.

Hodges, R. J., Buzby, J. C., & Bennett, D. B. (2011). Postharvest losses and waste in developed and less developed countries: Opportunities to improve resource use. *Journal of Agricultural Science, 149,* 37 – 45.

Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing?. *Journal of Personality and Social Psychology, 79(6),* 995-1006.

Jacobs, J. A., & Gerson, K. (2004). *The time divide: Work, family, and gender inequality.* Harvard University Press.

Jones, T. W. (2005). Using contemporary archaeology and applied anthropology to understand food loss in the American food system, unpublished paper, Tucson, AZ: Bureau of Applied Research in Anthropology, University of Arizona. Retrieved from:

http://www.ce.cmu.edu/~gdrg/readings/2006/12/19/Jones_UsingContemporaryArchaeologyAndAppliedAnthropologyToUnderstandFoodLossInAmericanFoodSystem.pdf

Kahneman, D., & Thaler, R. H. (2006). Utility maximization and experienced utility. *Journal of Economic Perspectives*, *20(1)*, 221-234.

Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American psychologist*, *39(4)*, 341-350.

Kantor, L. S., Lipton, K., Manchester, A., & Oliveira, V. (1997). Estimating and addressing America's food losses. *Food Review*, *20(1)*, 2-12.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development.* Englewood Cliffs, NJ; Prentice Hall.

Lebersorger, S., & Schneider, F. (2011). Discussion on the methodology for determining food waste in household waste composition studies. *Waste Management*, *31*, 1924-1933.

Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. Thousand Oaks, CA: Sage.

Loewenstein, G., O'Donoghue, T., & Rabin, M. (2003). Projection bias in predicting future utility. *The Quarterly Journal of Economics*, 1209-1248.

Love food hate waste. An introduction, available at: http://www.wrap.org.uk/sites/files/wrap/Love%20Food%20Hate%20Waste%20Retailer%20Introduction.pdf (accessed on 29 July 2014).

Mägi, A. (1999). Store loyalty?: an empirical study of grocery shopping (Doctoral dissertation). Retrieved from Google Scholar.

Mitchell, D. (2014). Say goodbye to your supermarket. *Fortune.* Retrieved from http://fortune.com/2014/03/14/say-goodbye-to-your-supermarket/

Morisaki, I. (2011). Pattern of food losses in households: a case study in Oita-Prefecture, Japan (master's thesis). Retrieved from Google Scholar.

Morse, J. (2007). Sampling in Grounded Theory. In A. Bryant & K. Charmaz (Eds.), *The SAGE Handbook of Grounded Theory* (pp. 229-244). London: Sage Publications.

Muth, M. K., Karns, S. A., Nielsen, S. J., Buzby, J. C., & Wells, H. W. (2011). *Consumer-level food loss estimates and their use in the ERS loss-adjusted food availability data* [Bulletin No. 1927]. Retrieved from: http://www.ers.usda.gov/

Parfitt, J., Barthel, M., & Macnaughton, S. (2010). Food waste within food supply chains: quantification and potential for change to 2050. *Philosophical Transactions of the Royal Society B: Biological Sciences, 365(1554)*, 3065-3081.

Pollan, M. (2010, June 10). The Food Movement, Rising. *The New York Review of Books.* Retrieved from http://www.nybooks.com/articles/archives/

Quested, T. E., Parry, A. D., Easteal, S., & Swannell, R. (2011). Food and drink waste from households in the UK. *Nutrition Bulletin, 36(4),* 460-467.

Quested, T. E., Marsh, E., Stunell, D., & Parry, A. D. (2013). Spaghetti soup: The complex world of food waste behaviours. *Resources, Conservation and Recycling, 79,* 43-51.

Read, D., & van Leeuwen, B. (1998). Predicting hunger: The effects of appetite and delay on choice. *Organizational Behavior and Human Decision Processes, 76(2),* 189-205.

Reckwitz, A. (2002). Toward a theory of social practices: A development in culturalist theorizing. *European Journal of Social Theory, 5(2),* 243-263.

Reis, H. T., & Gable, S. L. (2000). Event sampling and other methods for studying everyday experience. In H. T. Reis & C. M Judd (Eds.), *Handbook of Research Methods in Social and Personality Psychology* (pp. 190-222). Cambridge: Cambridge University Press.

Richins, M. L. & Dawson, S. (1992). A consumer values orientation for materialism and its measurement: Scale development and validation. *Journal of Consumer Research, 19(3),* 303-316.

Scheibehenne, B., Greifeneder, R., & Todd, P. M. (2010). Can there ever be too many options? A meta-analytic review of choice overload. *Journal of Consumer Research, 37(3),* 409-425.

Schneider, F. (2008). Wasting Food - An Insistent Behaviour. Paper presented at Waste - The Social Context '08, Canada: Shaw Conference Centre, p. X1-X10.

Schwartz, B. (2004). *The paradox of choice.* New York: Ecco.

Schwartz, S. (2012, October 8). "As waistlines grow, so do refrigerator sizes." CNBC. Retrieved from: http://www.cnbc.com/id/49101730

Shiv, B., & Fedorikhin, A. (1999). Heart and mind in conflict: The interplay of affect and cognition in consumer decision making. *Journal of Consumer Research, 26(3),* 278-292.

Simon, H. A. (1972). Theories of Bounded Rationality. In C. B McGuire & R. Radner (Eds.), *Decisions and Organization* (pp. 161-176). North-Holland Publishing Company.

Simonson, I. (1990). The effect of purchase quantity and timing on variety-seeking behavior. *Journal of Marketing Research, 27(2),* 150-162.

Sonesson, U., Anteson, F., Davis, J., & Sjödén, P. O. (2005). Home transport and wastage: environmentally relevant household activities. *A Journal of the Human Environment, 34(4),* 371-375.

Stefan, V. (2011). Romanian consumers' perceptions and practices regarding food waste (master's thesis). Retrieved from Google Scholar.

Stefan, V., van Herpen, E., Tudoran, A. A., & Lähteenmäki, L. (2013). Avoiding food waste by Romanian consumers: The importance of planning and shopping routines. *Food Quality and Preference, 28*, 375-381.

Stilley, K. M., Inman, J. J., & Wakefield, K. L. (2010). Planning to make unplanned purchases?: The role of in-store slack in budget deviation. *Journal of Consumer Research, 37(2), 264-278.*

Strauss, A. C. & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage Publications.

Tackling food waste: The EU's contribution to a global issue. (2014, February 7). *European Parliamentary Research Service.* Retrieved from http://epthinktank.eu/2014/02/07/tackling-food-waste-the-eus-contribution-to-a-global-issue/

Thaler, R. (1999). Mental accounting matters. *Journal of Behavioral Decision Making, 12*, 183-206.

Thompson, C. J. (1997). Interpreting consumers: A hermeneutical framework for deriving marketing insights from the texts of consumers' consumption stories. *Journal of Marketing Research, 34(4)*, 438-455.

Tversky, A., & Kahneman, D. (1972). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology, 4*, 207-232.

Tversky, A., & Kahneman, D. (1981). Framing of decisions and the psychology of choice. *Science, 211*, 453-458.

Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk & Uncertainty, 5(4),* 297-323.

"UN official underlines link between food security and climate change." (2011, December 2). UN News Centre. Retrieved from: http://www.un.org/apps/news/story.asp?NewsID=40604

Van Garde, S. J., & Woodburn, M. J. (1987). Food discard practices of householders. *Journal of the American Dietetic Association, 87(1),* 322-329.

Wansink, B. (1996). Can package size accelerate usage volume? *Journal of Marketing, 60(3),* 1-14.

Wansink, B. (2004). Environmental factors that increase the food intake and consumption volume of unknowing consumers. *Annual Review of Nutrition, 24*, 455-479.

Watson, M., & Meah, A. (2013). Food, waste and safety: Negotiating conflicting social anxieties into the practices of domestic provisioning. *The Sociological Review, 60(S2),* 102-120.

Warde, A. (2005). Consumption and Theories of Practice. *Journal of Consumer Culture, (5(2),* 131-153.

Wilson, A., & Boehland, J. (2005). Small is beautiful: U.S. house size, resource use, and the environment. *Journal of Industrial Ecology, 9(1-2),* 277-287.

Zhu, M., & Kalra, A. (2011). Resource Abundance and Conservation in Consumption. Retrieved from http://faculty.chicagobooth.edu/workshops/marketing/past/pdf/Zhu_Resource%20Abundance%20and%20Conservation%20in%20Consumption.pdf

APPENDIX A

Screening Questionnaire:

10. Age: _____

Gender: _____

11. Number of people in your household:
_____ Adults
_____Children
_____ Ages of children (if applicable)

12. Employment status (check all that apply):
__ Employed full time
__ Employed part time
__ Unemployed
__ Retired
__ Homemaker
__ Full time student
__ Part time student

13. Employment status of other adult in the household with whom you share food and household expenses (check all that apply):
__*There is no other adult in the house with whom I share food and expenses*

__ Employed full time
__ Employed part time
__ Unemployed
__ Retired
__ Homemaker
__ Full time student
__ Part time student

14. Annual Household income (check one):

__ Less than 20,000
__ 21,000 to 50,000
__ 51,000 to 80,000
__ 81,000 to 120,000
__ More than 120,000

15. Who is primarily responsible for food shopping in your household? (Check one)
__ Self
__Partner/Spouse
__Joint
__Other: _____

16. Who is primarily responsible for food preparation/cooking in your household? (Check one)
__ Self
__Partner/Spouse
__Joint
__Other: _____

17. Who is primarily responsible for kitchen cleaning and dishes in your house? (Check one)
__ Self
__Partner/Spouse
__Joint
__Other: _____

18. On average, how often do you eat dinner outside of your own home (including restaurants, drive-thrus and meals at friends' houses)? (Check one)

__ Never
__ Less than once a month
__ Several times a month
__ Once a week
__ Several times a week
__ Almost every day

19. Please check any of the following practices that your household engages in regularly:

__ cooking "from scratch"
__ baking
__ gardening
__ composting
__ recycling

20. On a scale of 1 to 5, with 1 being never and 5 being always, please indicate your level of participation in the following activities:

____ I have a mental list of things I need running through my head as I grocery shop (PB1).
____ I bring a written grocery list to the store when I grocery shop (PB2).
____ I bring coupons with me when I grocery shop (PB3).
____ I have particular meals in mind when I shop at the grocery store (PB4).
____ I plan out meals for the week before I shop at the grocery store (PB5).

____ I have a regular day of the week when I do my grocery shopping (PB6).
____ I prepare meals or parts of meals ahead of time (PB7).

21. Do you subscribe to a meal planning service?

___ Yes, current subscriber. Which plan? _____
___ No, but I have been a subscriber to a service in the past.
___ No, I have never been a subscriber to a meal planning service.

22. Does your kitchen have a garbage disposal?

__Yes
__No

APPENDIX B

Participant Descriptions:

STUDY NAME	AGE	GENDER	# of Adults in HH	# of Children (< 18) in HH	Ages of Children (if applicable)	Employment Status	Employment Status of other adult in household	Income	Person primarily responsible for food shopping	Person primarily responsible for food preparation	Person primarily responsible for kitchen clean-up	Frequency of dining outside the home	PB1	PB2	PB3	PB4	PB5	PB6	PB7	Total Planning Behavior (PB) Score	Ever subscribed to a paid meal planning service?
Mary	29	F	2	0		Employed FT; Student PT	Employed FT; Student PT	$51-80K	Self	Self	Self	Several times/month	5	4	1	4	4	3	4	25	Never
Nora	31	F	2	0		Employed, FT	Employed, FT	$81-120K	Self	Self	Spouse	1 time/week	3	5	2	5	5	4	4	28	Current
Anna	32	F	1	0		Employed, PT	None	$21-50K	Self	Self	Self	Never	4	3	2	5	3	3	4	24	Never
Cheryl*	32	F	2	1	1	Employed, FT	Employed, FT	$51-80K	Self	Self	Self	Several times/month	4	3	3	4	4	1	1	20	Never
Neal*	32	M	2	0		Employed, FT	None	$21-50K	Self	Self	Self	1 time/week	3	3	1	3	2	1	3	16	Never
Zach	33	M	5	1	4	Student, FT	1,2,5,7	$51-80K	Self	Other household member	Self	Several times/month	2		2	4	3	1	1	13	Never
Erin	34	F	2	2	1, 3	Homemaker	Employed FT; Employed PT	$81-120K	Self	Self	Self	Several times/month	3	4	1	5	5	4	2	24	Never
Suzy*	39	F	2	3	3, 6, 9	Employed FT; Student FT	Employed, FT; Student, PT	$81-120K	Self	Self	Self	Several times/month	4	4	1	4	2	4	3	22	Never
Jane	41	F	1	1	5	Employed, FT	None	$21-50K	Self	Self	Self	Never	4	3	3	3	3	2	2	20	Never
Kyle	41	M	2	1	14	Employed, FT	Homemaker	$51-80K	Shared	Spouse	Shared	Never	5	3	4	4	2	4	3	25	Never
Linda	48	F	3	0		Employed, FT	Employed, FT	$51-80K	Self	Self	Self	Several times/month	5	4	4	4	4	4	4	29	Never
Ella	51	F	1	0		Unemployed	None	<$20K	Self	Self	Self	<1time/month	4	5	3	3	2	1	2	20	Never
Rose	56	F	2	0		Employed, PT; Retired	Employed FT	$81-120K	Self	Self	Self	<1time/month	5	4	3	3	3	2	3	23	Past
Greg	56	M	2	0		Employed, PT	Employed, PT	$21-50K	Shared	Self	Spouse	Several times/month	5	2	1	4	3	1	3	19	Never
Sara	58	F	1	0		Employed, FT	None	$21-50K	Self	Self	Self	<1time/month	5	4	1	2	1	1	4	18	Never
Sylvia*	60	F	2	1	17	Employed, PT	Employed, FT	>$120K	Self	Self	Self	1 time/week	4	4	1	5	5	4	3	26	Past
Rick	70	M	1	0		Retired	None	$51-80K	Self	Self	Self	Several times/month	3	4	2	4	2	1	4	20	Never

* Transcripts used in open coding to develop codebook.

APPENDIX C

Summary of Participant Data

N = 17

Ages:
29-70

Gender:
Females – 12; Males – 5;

Household Composition:
Partnered/Married – 10; Roommates – 2; Single – 5;
Minor children (<18) living in household – 7;

Household Income:
<$20K – 1; $21-50K – 5; $51-80K – 6; $81-120K – 4; >$120K – 1;

Employment:
Employed full-time – 10; Employed part-time – 4; Student – 1; Homemaker – 1; Retired – 1; Unemployed – 1; Multiple categories (ex. Full-time work + student) – 3;

Total Planning score:
>21 – 9; <21 – 8;