Building Sustainability through Social Marketing: Encouraging Reusable Shopping Bag Use at Stadium Thriftway in Tacoma, WA – A Case Study

Alysen Laakso

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James Gawel

Ellen Moore

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Abstract

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Alysen Laakso

Chair of the Supervisory Committee:
Associate Professor James Gawel
Interdisciplinary Arts and Sciences Program

Strong sustainability represents a paradigm shift that places environmental conservation and social well-being above the economy and hyper-consumption. Building sustainability requires replacing single-use disposables with durable reusables. This thesis focuses on one ubiquitous single-use disposable – grocery store shopping bags. The environmental science demonstrates that single-use shopping bags, both paper and plastic, incur unnecessary environmental costs because there is a more sustainable alternative in reusable bags. However, in order to pass and enforce successful bag regulations, bag legislation proponents have to garner community support and involvement. Therefore, community-based social marketing (CBSM) is examined as a method to build sustainable behavior in communities. In order to assess the merit of CBSM, a case study was performed at a mid-sized grocery store in Tacoma, Washington. The campaign attempted to decrease single-use shopping bag consumption by increasing reusable shopping bag use through the use of CBSM techniques. Ultimately, CBSM proved successful at changing shopping bag habits and increasing sustainable behavior.

Unless someone like you cares a whole awful lot, nothing is going to get better. It's not.

Dr. Seuss

To Lila and Elyssa Ortiz

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Table of Contents

INTRODUCTION

Our planet is being overwhelmed by plastic. Plastic debris has been found in every ocean including the deep sea and the Southern Ocean around Antarctica (Barnes, Galgani, Thompson, and Barlaz, 2009). One study reports that there are up to 46,000 pieces of plastic per square mile of ocean (UNEP, 2006) and another states that 60 to 80% of marine litter is plastic (O'Brine and Thompson, 2010), much of which resides in oceanic "garbage patches," which are naturally occurring gyres whose rotational patterns draw in and traps the debris (Hawkins, 2010). The largest one is the Great Pacific Garbage Patch about 1,000 miles off the Californian coast (Greenpeace, 2006; Greenwood, 2011; Mieszkowski, 2007). While the gyre draws in all types of debris, because plastic doesn't biodegrade, it can remain in the gyre for hundreds of years (Barnes et al., 2009; Greenwood, 2011; Mieszkowski, 2011). This is important because plastic is dangerous to animals (Gregory, 2009; O'Brine and Thompson, 2010; Spivey, 2003). While no definitive numbers exist, Greenpeace estimates that 267 different species and up to 100,000 marine animals are effected by plastic every year either by entanglement or consumption (Greenblatt, 2010; GreenPeace, 2006). Finally, much of this plastic is for single-use disposable items, including plastic shopping bags, which are meant to be used one time and then thrown away (Hawkins, 2010; Spivey, 2003).

Plastic shopping bags were first used in the late 1970s, when grocery stores began offering these bags to their customers as an alternative to single-use paper bags (Petroski, 2003). Retailers prefer plastic bags because they are cheaper, more lightweight, and more compact making plastic bags easier to store (Roach, 2003). Now, approximately 4 out of 5 shopping bags used by Americans are plastic shopping bags (Paper or plastic, 2008; Roach, 2003). Plastic

shopping bags are also ubiquitous internationally; it is estimated that 500 billion to 1 trillion plastic bags are used every year (Paper or plastic, 2008) and according to *The Washington Post*, every year up to 4 billion of these bags enter the litter stream (Maloney and Stanton, 2007). Because plastic shopping bags take hundreds of years to photodegrade (O'Brine and Thompson, 2010), each year these newly littered bags join other plastic bags already in the environment. This is why plastic shopping bags are one of the debris items found most often by coastal cleanup crews (Greenblatt, 2010; Spivey, 2003).

Because of their pervasiveness and recalcitrance as waste, plastic shopping bags have become a major focus for environmental activists interested in promoting sustainable behavior and decreasing environmental waste and pollution (Spivey, 2003). Additionally, because paper bags also have numerous environmental costs associated with them (Thompson, 2007), environmental groups argue that reusable bags need to replace single-use shopping bags. This thesis addresses the components of that argument, asking three questions regarding sustainability, the environmental costs of shopping bags, and behavior change. First, what does sustainability mean and why is fostering sustainable behavior important? Second, are reusable shopping bags the more environmentally sustainable option? Third, if the answer is yes, how can American grocery store shoppers be encouraged to use reusable shopping bags instead of single-use paper or plastic shopping bags?

Chapter One, "The Sustainability Paradigm," answers the first question, making the argument that while weak sustainability is a type of greenwashing to maintain "business as usual," strong sustainability represents a significant social paradigm shift capable of offering an alternative to the consumerist, disposable lifestyle currently being promoted in America. Additionally, a major component of building strong sustainability is replacing single-use

disposables, which represent unnecessary consumption and waste, with durable reusables. Chapter Two, "The Environmental Consequences of Shopping Bags," surveys several life cycle assessment reports, comparing the environmental costs of single-use and reusable shopping bags. The chapter concludes that while reusable shopping bags are not free of environmental consequences, they remain the most sustainable bag option when shoppers need a bag for their purchases.

However, the third question still remains: how is reusable shopping bag use encouraged? Some cities and countries have attempted to regulate retailer and consumer use of shopping bags. Chapter Three, "Society and Shopping Bags," documents the history of this shopping bag legislation, examining the difference between effective and ineffective bag regulations. Ultimately, successful regulation occurs when bag legislation proponents build community support and citizen involvement. Therefore, environmental groups need to directly target the local populace by engaging the community and promoting voluntary change. Chapter Four, "Social Marketing to Encourage Sustainable Behavior," discusses methods to directly target individuals in specific communities. Social marketing is presented as the most effective approach to aiding sustainable behavior change amongst a busy, overburdened populace. Community-based social marketing (CBSM) is a social marketing method designed to engage the community during every step in order to ensure the effectiveness of a behavior change campaign.

Finally, in order to assess CBSM's ability to encourage reusable shopping bag use in the United States, a case study was performed at a local grocery store, Stadium Thriftway, in Tacoma, Washington. Chapter Five, "Encouraging Reusable Shopping Bag Use," details the implementation, results, and analysis of this case study. Ultimately, the research in this thesis

shows that CBSM is an effective tool for increasing sustainable behavior and can help build the strong sustainability paradigm in modern life.

CHAPTER ONE: The Sustainability Paradigm

The Oxford-English Dictionary defines 'sustainable' as an adjective meaning "able to be maintained at a certain rate or level" ("Sustainability," 2013). However, this general definition of sustainable can be applied to a wide range of non-environmental fields, such as financial sustainability or sustainable health practices. Therefore, the environmental community has sought to cultivate a definition of sustainability that specifically speaks to the importance of environmental protection and conservation – i.e. society's need to develop social systems and practices that work within ecological and social limits to allow long-term, if not indefinite, human prosperity and survival (Attfield, 2003).

As an environmental term, sustainability (sometimes called "sustainable development") was first popularized in 1987 when the Brundtland Commission used it in their report on how to address myriad environmental problems while continuing to develop society. The Commission defined sustainability as being able "to meet the needs and aspirations of the present without compromising the ability to meet those of the future" (WCED, 1987, p. 142). However, this definition does not specifically mention the environment or environmental resources. In addition, many of the definition's components, such as "future" and "needs," are vague and ill-defined making it difficult to operationalize (Lele, 1991; Luke. 2005). Therefore, since the summit, environmental philosophers and researchers have debated what that definition means in terms of humanity's relationship with and responsibility to society and the environment (Adelson, Engel, Ranalli, and Van Anglen, 2008; Attfield, 2003; Edwards, 2005).

Philosophically speaking, when discussing this relationship, experts break the sustainability into three parts: the economy, society, and the environment (Attfield, 2003;

Edwards, 2005). They do so because each part is in itself a unique sub-system – distinct yet interdependent and capable of having major impact and influence over the other two parts (Norgaard, 1988). However, there has been a lot of debate on how these sub-systems ultimately relate (i.e. are they a three legged stool, a foundation with supporting structure, or something else entirely) (Adelson et al., 2008). Figure 1 below shows a modern interpretation of the human-environment dynamic (Strachan, 2009; Vucetich and Nelson, 2010).

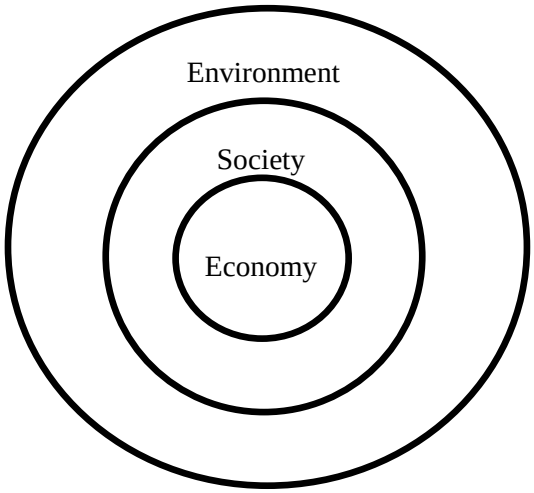

Figure 1: Human-Environment Dynamic (Strachan, 2009, p.87)

In this diagram the sub-systems act like Russian nesting dolls. Each smaller system rests in and relies on the larger one. However, there are two ways to read it. First, there is *weak sustainability*, which posits that because the economy is at the center of the three circles, protecting and growing it is the primary requirement for maintaining society (Norton, 2005; Strachan, 2009). In contrast, *strong sustainability* argues that as the largest circle, the environment is the most important sub-system because human society needs a strong environment in order to flourish and thus the economy is a meaningless abstract without a functioning society and healthy environment to give it value (Blewitt, 2008). This chapter will analyze these two sides of the sustainability debate with specific attention given to the criticism

of greenwashing in order to assess whether either model can offer any meaningful insight as to how to promote environmental protection and conservation in modern society.

Greenwashing and Sustainability

"Greenwashing" is a term coined in 1986 to describe "organizations that spend more time and money advertising that they are green than on actually putting into place environmentally friendly practices" (Orange, 2010, p. 30). Due to lax regulation, organizations can label a product as being "green," "eco-friendly," or "sustainable" without having met certain standards to prove that their product is actually better for the planet (Dahl, 2011; Hansen, 2010; Orange, 2010). In fact, in many cases, the product may even do more environmental harm than good (Hansen, 2010).

For example, the Malaysia Palm Oil Council created an advertisement touting the industry as "eco-friendly," but critics have linked palm oil plantations to rainforest species extinction, habitat loss, and pollution (Dahl, 2011). This commits the "sin of vagueness," which refers to labeling "that is so poorly defined or broad that its real meaning is likely to be misunderstood by the consumer." (TerraChoice, 2010, p. 10). In other words, the Malaysia Palm Oil Council calls its products "eco-friendly" without defining what that term means or how their product actually protects or conserves the environment (Dahl, 2011). Therefore, a customer may go into a supermarket to buy an "eco-friendly" palm oil only to find that it isn't significantly better for the environment than the "non-green" brand.

In regards to the term "sustainability," critics argue that it too has been greenwashed, becoming a term "used as a 'label' placed over modes of existence that are [not]…'sustainable' " (Springett, 2005, p. 210). To a certain extent this criticism is accurate. Sustainability has, at

times, been co-opted by organizations more interested in maintaining the status quo than affecting real change. For example, oil companies have a long history of adapting "the emerging public and political language of climate change" (Hansen, 2010, p. 141) to promote themselves as environmentally responsible. British Petroleum (BP) in particular has worked for years to establish itself as a company dedicated to alternative, clean energy even though only a small fraction of its 2009 profits were actually invested in alternative energy. Additionally, a 2007 survey showed that the general public believed BP to be greener than its competitors. However, the company still gets most of its profits from eco-destructive oil and gas, which have major negative impacts on the planet (Orange, 2010).

Therefore, while businesses co-opt "sustainable" language and imagery, one study found that none of the advertisements actually called for the business or the consumer to engage in more eco-friendly behavior like saving energy or recycling (Hansen, 2010). Because of this, critics like Timothy Luke (2005) have argued that the sustainability ethos "accepts the prevailing form of mass market consumerism as it currently exists" (p. 231) and that it is nothing more than greenwashing current, eco-destructive business practices for contemporary society. The sustainability philosophy itself simply becomes another form of commodification, labeling products as "green" or "sustainable" in order to grow the economy and increase consumption (Luke, 2005).

However, there are two branches of sustainability, weak and strong, which posit the focus of sustainability in very different ways (Attfield, 2003; Beckerman, 1994; Costanza and Daly, 1992; Norton, 2005; Vucetich and Nelson, 2010). Both theories do concur with the general definition of sustainability as outlined above: that the environment, society, and the economy have to be maintained in such a way as to ensure the future's needs are considered and met

(Norton, 2005). The divergence occurs over the concept of capital (Attfield, 2003). Capital is a stock or resource "that yields flow of valuable goods or services into the future" (Costanza and Daly, 1992, p. 38). In other words, anything that is necessary for human survival and prosperity is considered capital – plants and animals for food, water for hydration, manufacturing plants and equipment, and human-made goods and services. The sections below will illustrate how weak and strong sustainability diverge in regard to capital and assess what this mean for the greenwashing criticism.

Weak Sustainability

According to weak sustainability, all capital is equally substitutable (Attfield, 2003) – i.e. human-made resources can easily replace natural resources. Norton (2005) writes "weak sustainability is weak in the sense that it requires the maintenance of no particular asset classes…sustainability is achieved when total societal wealth is maintained across generations" (p. 307). In this scenario it doesn't matter how much of one resource society uses as long as another resource is substituted. So society today can indiscriminately use oil or coal for energy as long as a different energy resource is found and saved for society tomorrow.

It is this tenet of substitutability that allows weak sustainability to maintain that the economy is the most important sub-system. Beder (1994) argues that weak sustainability is seeking "sustainable economic expansion" instead of "the sustainable use of resources" (p. 8). If the goal is to maintain total societal wealth, then the focus needs to be on continual growth and expansion of the economy and little concern needs to be given to other forms of capital such as social equity or air and water pollution control. Instead, in the words of Vucetich and Nelson

(2010), the goal of this form of sustainability is to "exploit as much as desired without infringing on future ability to exploit as much as desired" (p. 540).

For example, while the Brundtland Commission provided one of the first widely recognized definitions of sustainability, to the commission poverty was a major cause of environmental degradation (Castro, 2004). As such, the commission posited that encouraging economic growth, building freer markets, and limiting regulation would lead to better environmental protections and policies (Castro, 2004). The argument goes that issues such as pollution should be evaluated in terms of economic assets and debits rather than as a new way to understand and interact with the environment (Beckerman, 1994). Because the free market will always work to ensure its continued survival and expansion, turning the environment into economic assets is the best way to safeguard environmental protections (Beder, 1994). Ultimately, in this view continuing and even expanding contemporary business and economic practices is the best way to ensure environmental protection and conservation (Beckerman, 1994; Castro 2004; Luke, 2005).

Therefore, weak sustainability is, in fact, a restating of contemporary business practices and values (Costanza and Daly, 1992; Beckerman, 1994; Beder, 1994; Luke, 2005; Norton, 2005; Redclift, 2005). As long as big business can assure the general populace, governments, and the environmental community that the sum of total capital is being safeguarded for future needs, there is no problem in the continued commodification and utilization of all natural capital – renewable or non-renewable (Attfield, 2003; Costanza and Daly, 1992; Norton, 2005). Instead of offering new ideas on how to engage with the environment, weak sustainability is instead taking the language of the environmental movement and using it to promote the business status quo of consumption and growth (Beder, 1994; Luke, 2005). Subsequently, it is accurate to say that weak

sustainability is greenwashing and should be rejected as not being a new set of environmental principles.

Strong Sustainability

Strong sustainability, on the other hand, diverges from weak sustainability in its understanding and value of natural capital (Attfield, 2003; Norton, 2005). Natural capital is another word for natural resources – the trees, animals, air, and water that humans need for survival. As Costanza and Daly (1992) illustrate, natural capital cannot be adequately replaced by human-made capital because human-made capital is still made from natural resources. Instead, the relationship between human-made capital and natural capital is "one of complementarity, not substitutability" (Costanza and Daly, 1992, p. 41).

From that conclusion, Costanza and Daly (1992) then begin the process of separating the terms "growth" and "development." Growth is "pushing more matter-energy through the economy" (p.43). Basically, growth is having to continually build more, earn more, and consume more, which is destructive to natural capital. Unfettered growth will, eventually, "cost us more than it is worth" (Costanza and Daly, 1992, p. 43) because all natural capital is limited. Nonrenewable resources, obviously, cannot be put back after they have been consumed, but even renewable resources take time to replace.

In contrast, Costanza and Daly (1992) write that development is about finding ways to squeeze "more human want satisfaction out of each unit of matter-energy that passes through" (p. 42). Instead of simply building and consuming more, society needs to get more use and enjoyment out of what is already being produced. Therefore, future development has to foster "'the growth of limits' " (p. 44), like increased efficiency and consumption control in order to

secure the continued existence of vital natural resources (Costanza and Daly, 1992). In other words, human society must develop in a way as to protect and nurture the environment if for no other reason than to promote our own welfare and survival (Schor, 2010). Juliet Schor (2010) calls this idea "plentitude" and proposes it as an alternative to the economic driven "business as usual."

Because of this strong sustainability cannot be criticized as mere greenwashing. The framework set into place by Costanza and Daly (1992) clearly outlines a general guideline from which to delineate a strong sustainability ethos from the traditional business ethos. Specifically, strong sustainability takes note of two important facts: (1) that certain types of economic growth and activities can have major negative consequences for the environment; and (2) that all of society, the economy included, is dependent on a healthy environment for survival (Kumar, 2009; Schor, 2009; Stibbe, 2009). Simply growing profit and economy isn't sustainable if it does lasting damage to natural resources or the environment (Attfield, 2003; Redclift, 2005; Vucetich and Nelson, 2010). Instead, a strong sustainability philosophy re-images human society: one where society and the economy work together to protect and maintain a diverse and robust natural environment in order to ensure the perpetuation of our own species (Attfield, 2003; Blewitt, 2008).

Building the Strong Sustainability Paradigm

Thus, this thesis has rejects weak sustainability as a form of greenwashing that does not make a meaningful impact on reshaping the human-environment dynamic. On the other hand, strong sustainability has been shown to have significant insight into that relationship. In fact, at its core strong sustainability represents an attempt to implement a major social paradigm shift.

Right now, a major problem in achieving long-term environmental change is that modern Western society is built on the twin philosophies of consumption and economic expansion (Blewitt, 2008; Fagan, 2009; Hagen, 2010; Luke, 2005; Schor, 2011; Schwarz, 2000). As outlined in the section above, growth and expansion requires pushing more and more goods and services through the economy (Costanza and Daly, 1992). This means that businesses have to continually expand their market share (Schwartz, 2000) by turning private citizens into consumers and then convincing these consumers to purchase an ever expanding list of "stuff" (Schor, 2011; Schwartz, 2000). For example, Schor (2011) coined the term "competitive consumption" to represent the idea that the need to "keep up" has long been a part of American culture. An average American family feels the pressure to match the consumption rate and lifestyle of the ever-present "Jones" (Schor, 2011).

Moreover, as consumer culture has taken over and the focus of comparison has moved from the neighbor down the street to the lifestyles of the rich and upper-middle class as depicted on reality television, the requirements for consuming competitively have rapidly increased (Schor, 2011). In fact, modern American society has become hyper-consumptive; "the message is constant: all our most treasured values…are reduced in one way or another to commodities provided by the market…human happiness is to be located in individual consumption as well" (McChesney, 2008, p. 280). According to Schwartz (2000), in today's society, everything has become economized through the free market – love and relationships, games and sports, and even religion and morals. Everything has become an accounts balance book with investments, debts, returns, and profits (Schwartz, 2000).

For example, it has gotten to the point that even children are now considered to be "consumers-in-training" (Kline, 2007). According to Kline (2007), "today's children have and

spend more money than previous generations; they are more knowledgeable about a wider range of brands and marketing; and they have more to say in what their families consume" (p. 281). Toys, cereals, candy, and even hygiene products directly market to children teaching them what to consume and how to consume at a very young age. However, to go along with this new conception of childhood, there are also increased obesity rates, increased ADHD, and increased depression (Kline, 2007; Louv, 2008).

Schwartz (2000) and McChesney (2008) both write passionately about how consumerism and commercialism tend to produce "profound cynicism and greed" (McChesney, 2008, p. 280). Instead of being happier, individuals find themselves more and more taxed – each generation working harder than the last to try and maintain an accepted standard of living; each generation being trained to earn more, spend more, consume more, and waste more in order to grow the economy (Kline, 2007; McChesney, 2008; Schor, 2011; Schwartz, 2000). All of this points to a growing sense of disenfranchisement in American society and a growing realization that economic-consumption paradigm hasn't ensured a real, long lasting human happiness (Kline, 2007; McChesney, 2008; Schwartz, 2000). According to Schor (2010), after the 2008 economic collapse, the savings rate increased and discretionary spending dramatically dropped; there is a growing public awareness that the American way of life is unsustainable, that the economic-consumption paradigm has ultimately failed.

Strong sustainability, therefore, represents a response to this economic-consumption paradigm. Ultimately there can be no economy without society and no society without an environment capable of supporting it. The new sustainability paradigm has to reassert social capital and natural capital over financial capital (Schor, 2010). In other words, people need to "work and spend less, create and connect more" (Schor, 2010, p. 7). Most importantly, American

society has to move away from a single-use, disposable lifestyle that values unnecessary consumption and waste. A major reason why American families have to work so hard is that so much more is required to be consumed. Instead of building things, producing things, or reusing things, the modern mantra is cheap convenience; but "the less one has to buy, the less one is required to earn" (Schor, 2010, p. 5) and the less goods that are bought, the less natural resources that are required to be consumed to make those goods.

This research focuses on that component of the strong sustainability paradigm: the need to replace the cheap, single-use disposable (Schor, 2010) with a lifestyle that values durable, reusable products. More specifically, this research focuses on one such product – grocery store shopping bags. Grocery store shopping bags were selected as the focus of this thesis for three reasons. First, they are symbolic of a disposable culture – an item designed to be used one time and then casually discarded. Second, both paper and plastic single-use shopping bags have significant environmental consequences. Third, there is a sustainable alternative in the reusable shopping bag, which is meant to be used over a period of several years for countless numbers of shopping trips. Therefore, this thesis will specifically examine shopping bags through a case study intended to build sustainable behavior by increasing reusable shopping bag use while decreasing single-use shopping bag consumption.

CHAPTER TWO: The Environmental Consequences of Shopping Bags

Single-use shopping bag consumption is ubiquitous. In the United States alone, 10 billion paper bags and 100 billion plastic bags are used annually (Paper or plastic, 2008). However, environmental groups argue that neither type of bag is environmentally preferable because of the natural resources consumed, the air and water pollution generated, and the amount of solid waste and litter produced (Greenblatt, 2010; Mieskowski, 2007; Paper or plastic, 2008). Instead, these groups contend that reusable bags are the best environmental option (Llanos, 2012a; Save the Bay, 2012; Surfrider Foundation, 2013). This chapter will assess the validity of those claims by comparatively analyzing several lifecycle assessment studies, specifically focusing on the four bag options readily available in American grocery stores: (1) single-use high-density polyethylene (HDPE) plastic bags, (2) single-use paper bags, (3) reusable cotton bags, and (4) reusable polypropylene (PP) plastic bags.

Life Cycle Assessments

A life cycle assessment (LCA) analyzes a product from cradle (resource extraction) to grave (disposal) in order to assess its environmental impact (Mattila, Kujanpää, Dahlbo, Soukka, and Myllymaa, 2011; Scientific Applications International Corporation [SAIC], 2006); and *comparative* life cycle assessments evaluate the LCA results of different product options in order to decide which choice has the lowest environmental costs. All the comparative LCAs surveyed for this research evaluated the environmental costs for single-use and reusable shopping bags.

There are five general life cycle stages considered when performing an LCA: (1) resource extraction, (2) manufacturing; (3) product transportation; (4) consumer use; and (5) disposal (California State University [CSU], 2011; Mattila et al., 2011; Nolan, 2002; SAIC, 2006).

Resource extraction is the process of removing the raw materials from the Earth and preparing them for manufacturing. For paper bags, this stage would include the logging of trees, the machinery and fuel needed, and shipping the wood to processing plants (Nolan, 2002; Paper or plastic, 2008). The next stage, manufacturing, is the creation of the finished product. For example, the chemicals, energy, and machinery needed to turn polypropylene pellets into non-woven film that is then sewn into a reusable bag (CSU, 2011). The third stage is transportation and refers to the costs associated with shipping the product from the manufacturer to the retailer. Since the bags have different weights and volumes, it takes different amounts of energy to transport the same number of shopping bags. One source stated that it takes approximately seven trucks to transport the same amount of paper bags as can be carried by one truck load of single-use plastic bags (The Environmental Literacy Council, 2008).

The last two stages can be the hardest to assess because they occur after the customer has taken possession. Stage four is consumer use – i.e. product purchasing, use and reuse, and maintenance. Reusable bags, for example, have different environmental costs depending on how many times the bag is used and whether or not it is regularly washed (CSU, 2011; Mattila et al., 2011). The final stage is disposal, also called end-of-life scenarios. There are three main end-of-life scenarios in the United States: recycle, landfill, and litter (CSU, 2011). Recycling requires further consumption of energy to repurpose the old materials (Milstein, 2007), but it also saves on the environmental costs incurred by raw material extraction. Meanwhile, the majority of American trash winds up in landfills, which as a result of burial, often prevents product breakdown and remineralization (Paper or plastic, 2008). Finally, disposed products, especially plastic, that wind up as litter can have numerous environmental effects. As such, a complete

LCA should evaluate end-of-life scenarios, their prevalence, and at least include qualitative comparisons of associated environmental costs in decision-making.

While every LCA follows the same general stages, there is still a lot of room for interpretation; "system boundaries, consideration of avoided burdens, and the chosen allocation methods" (Mattila et al., 2011, p. 218) can largely influence LCA results. *System boundaries* refer to the borders or limitations assigned in the life cycle. For example, each LCA has its own "functional unit," or the amount of goods and time considered in the study. Most studies surveyed for this research gave their functional unit as one year of carrying goods in that country. *Consideration of avoided burdens* means credits given to a bag because it avoids other environmental costs. For example, the Finnish study gave credits for bags that were burned as energy in place of other energy sources (Mattila et al., 2011). Finally, *chosen allocation methods* refer to how a study divided the life cycle stages. The Nolan (2002) study included raw material extraction as part of the manufacturing process and each study used different assumptions for the end-of-life scenarios (i.e. how many bags were recycled, landfilled, or littered). Because each study had slightly different interpretations of system boundaries, avoided costs, or allocation methods, five LCAs were surveyed in order to comparatively assess their findings.

Australian Study

Studies comparing the LCA results of single-use paper bags versus plastic bags have been occurring since at least 1990 (Franklin Associates, 1990). Since then several different research groups have analyzed the environmental costs of these two options, all concluding that single-use paper bags are worse for the environment than single-use plastic bags (Bentley West Management Consultants, n.a.; Boustead Consulting and Associates, 2007; CSU, 2011; Franklin

Associates, 1990; Muthu, Li, Hu, Mok, and Ding, 2012). However, as far as comparing single-use shopping bags to reusable bags, the most widely cited report was performed in 2002 by Nolan-Itu Pty Ltd for the Australian government (Nolan, 2002).

The main goal of the Nolan report was to evaluate the environmental impact of plastic bags and to provide a foundation for informed debate regarding the development of national policy regarding plastic shopping bags in Australia (Nolan, 2002). As part of this goal, one chapter of the report presented an LCA comparison between plastic bags and the alternatives (Nolan, 2002, p. 27-41), specifically focusing on the 10 possible shopping bag options available in Australia. Four of these options were selected for inclusion in this research as being the most comparable to American grocery store bags: singlet HDPE bags (single-use plastic), calico bags (cotton bags), PP fiber "green bags" (reusable PP bags), and Kraft paper bags (single-use paper).

Bag Type	Weight	Relative Capacity	Bags/ Week	Expected Life	Bags/ Yr	Time in Litter Stream
HDPE	6 g	1 (6-8 items)	10	Single trip	520	5 years
Calico	125.4 g	1.1	9.1	1 year	9.1	2 years
PP fiber	PP: 65.6 g; Nylon base: 50.3 g	1.2	8.3	2 years	4.15	5 years
Kraft paper	42.6 g	1	10	Single trip	520	6 months

Table 1: Nolan Study Assumptions (Nolan, 2002, p. 35)

The functional unit for the Australian study was "the amount of shopping bags consumed to carry 70 grocery items home from the supermarket each week for 52 weeks" (Nolan, 2002, Appendix A). As can be seen in Table 1, there were several conservative assumptions made by the researchers. Calico (cotton) bags were only given a lifespan of 1 year and carrying capacity of 1.1 plastic bags. This means that shoppers were presumed to need to buy new bags every year and could only fill the bags with 7 to 9 items per trip. PP fiber bags were only given a lifespan of 2 years and a carrying capacity of 1.2 (7 to 10 items). Finally, plastic bags were assumed to

remain in the litter stream for only 5 years, an extremely conservative assumption considering that all scientific research indicates that plastic bags do not photodegrade until after at least 400 years (Aldred, 2008).

As for the LCA stages, the report included the extraction of raw materials under the manufacturing assessment. The transportation stage factored in the specific purchasing habits of Australia (i.e. the countries from which Australian retailers get their bags) and the consumer use stage did not include any reusable bag maintenance (washing). Finally, the end-of-life scenarios were presented as: HDPE bags – 78.5% landfill, 2% recycle, 0.5% litter, and 19% reuse; cotton bags – 99.5% landfill and 0.5% litter; PP fiber bags – 99.5% landfill and 0.5% litter; and paper bags – 39.5% landfill, 60% recycle, and 0.5% litter. The 19% reuse for HDPE bags means that those bags were being reused as garbage bin liners and as such were given a credit for avoiding the consumption of trash bags (Nolan, 2002, Appendix A).

Bag Type	Material consumption (kg)	Litter (g)	Litter (m^2)	Litter (m^2/y)	GHG (CO_2 eq.)	Primary energy use (MJ)
HDPE	3.12	15.6	0.144	0.72	6.08	210
Cotton	1.14	5.7	0.0041	0.0819	2.52	160
PP fiber	0.48	2.4	0.00187	0.00934	1.96	46.3
Paper	22.15	111	0.156	0.078	11.8	721

Table 2: Nolan Study Findings (Nolan, 2002, p. 36)

The Nolan study found that reusable bags had the lowest environmental impact (Table 2). Additionally, the "environmental gains from reusable bags are closely linked to the life expectancy of the bags, their weight-to-capacity ratio and their final destination" (Nolan, 2002, p. 71). Therefore, the PP bags, which had the longest lifespan and highest carrying capacity, are the best environmental option, while cotton bags are the second-best option. It can also be inferred that if the reusable bags were used longer or with higher carrying capacity than

estimated in the study, their environmental costs would decrease. Two additional studies were performed in Australia following up on the Nolan report findings. One report updated the study to expand the calico bag lifespan to 2 years (Hyder, 2007) and the other expanded the information on degradable plastic bags (Center for Design at RMIT University, 2005). Both reports upheld the findings of the Nolan study.

Asian Study

Using the information from the Nolan study, a group of researchers in China studied the environmental costs of shopping bags specifically incurred by China, Hong Kong, and India (Muthu, Li, Hu, and Mok, 2011). Therefore, the functional unit, the assumptions, and the life cycle stages presented in the Nolan report are also the same for this study. However, this study only included four bag options: single-use HDPE plastic bags, single-use paper bags, woven (cotton) bags, and non-woven (PP) bags (Muthu et al., 2011).The study looked at the global warming potential (GWP) of the bag options for China, Hong Kong, and India based on actual usage of shopping bags in the countries (Muthu et al., 2011).

As stated earlier, this Asian study used the Nolan report's LCA assumptions except that in China and Hong, 1095 HDPE plastic bags, 1095 paper bags, 10.95 PP fiber bags, and 21.9 cotton bags are used in a year (Muthu et al., 2011, p. 471) while in India 150 HDPE plastic bags, 150 paper bags, 1.5 PP fiber bags, and 3 cotton bags are used in a year (p. 472). However, because the environmental cost for each type of bag is assumed to be the same in each country, the GWP ratios are simply proportional to the number of bags used in each country. Only China-Hong Kong's results are presented here.

Bag Type	GWP in 20 years	GWP in 100 years	GWP in 500 years
HDPE	600	450	400
Cotton	500	400	375
PP Fiber	200	185	175
Paper	2300	1600	1500

Table 3: Findings for Global Warming Potential in China-Hong Kong ($kgCO_2$-eq.) (Muthu et al., 2011, p. 472)[1]

Ultimately this paper found that in terms of global warming potential reusable bags (PP fiber bags followed by cotton bags) are the best bag option for the environment (Table 3), reiterating the conclusion of the Nolan report. Additionally, as the Asian study used the same conservative estimates on reusable bag lifespan and carrying capacity, it can be inferred that if a reusable bag were to last twice as long, the global warming potential of reusable bags (either cotton or plastic) would decrease.

Scottish Study

In 2005, AEA Technology Environment and Associates performed an assessment of a possible plastic bag levy for the Scottish government (AEA Technology Environment, 2005). As part of their report, they researched a French study[2] that examined HDPE plastic bags, reusable LDPE plastic bags, and paper bags. After evaluating possible differences from the French study (including bag weight, Scottish consumption rates, and Scottish end-of-life scenarios), the study concluded that "the pattern of environmental impacts described in the Carrefour study will be similar to those in Scotland" (AEA Technology Environment, 2005, p. 30). Therefore, the study used the same functional unit, assumptions, and life cycle findings as presented in the French report. The Scottish report specifically looked at three types of bags: HDPE bags, reusable LDPE

[1] The numbers used in the table were approximated from a chart published with the findings
[2] The French report was not included in this study because an English version was not available for analysis

bags, and paper bags. HDPE bags and paper bags were given a 1:1 carrying capacity ratio, while the reusable LDPE to single-use bag ratio was 1:20. Additionally, the reusable LDPE bags were assessed regarding their impact at 2 uses, 4 uses, and 20 uses.

Environmental Impact	HDPE	Reusable LDPE (2x)	Reusable LDPE (4x)	Reusable LDPE (20x)	Paper bag
Non-renewable energy	1.0	1.4	0.7	0.1	1.1
Water Use	1.0	1.3	0.6	0.1	4.0
GHG emissions	1.0	1.3	0.6	0.1	3.3
Acid rain	1.0	1.5	0.7	0.1	1.9
Ozone formation	1.0	0.7	0.3	0.1	1.3
Eutrophication	1.0	1.4	0.7	0.1	14.0
Solid Waste	1.0	1.4	0.7	0.1	2.7

Table 4: Environmental Indicators for Plastic and Paper Bags
(AEA Technology Environment, 2005, p. 23)

Plastic bags were set to a baseline rating of 1.0 in all categories (Table 4). For the bag alternatives, numbers greater than 1 indicate having greater environmental impact, while numbers less than 1 indicate a lesser environmental impact (AEA Technology Environment, 2005). With only 2 uses, the reusable LDPE bags are in almost all categories (except for ozone formation) worse for the environment than the single-use HDPE bags. However, by 4 uses, reusable LDPE bags become better for the environment and their impact is even further decreased at 20 uses. Therefore, bag reuse is a major factor in decreasing environmental costs. The more a bag can and is reused, the better it is for the environment.

Finnish Study

Also published in 2011 was a research paper on the environmental impacts of shopping bags in Finland (Mattila et al., 2011). The goal of the research was to assess the carbon footprint of the different types of shopping bags in order to determine which bag was the best environmental

option. There were five bags studied for the LCA including, low-density polyethylene (LDPE) plastic, bleached paper, and cotton bags. HDPE shopping bags and PP reusable bags were not included because they are not commonly available in Finnish retail stores (Mattila et al., 2011).

The functional unit was defined as "carrying devices for the transportation of goods from grocery stores for 1 year in Finland" (Mattila et al., 2011, p. 219). After researching retail sale statistics, it was found that about 100 shopping bags were bought during one year and that carrying capacity ratio between LDPE plastic bags and paper bags was 1:1 (one LDPE bag carried the same amount as one paper bag). Additionally, it was assumed that one reusable cotton shopping bag would replace 50 to 150 single-use shopping bags. While the Finnish study researched past LCA reports, they collected their primary data from Finnish bag manufacturers and previous Finnish studies on energy production and waste management (Mattila et al., 2011). Avoided burden credits were given when LDPE plastic bags were used as trash bin liners or when any type of bag was burned for energy.

Bag Type	**Median**	**Range**
LDPE	3.6	-1.8 to 5.8
Paper	2.9	0 to 8.8
Cotton	2.5	0 to 7.9

Table 5: Carbon Footprint of Shopping Bags in Finland[3] ($kgCO_2$-eq./year) (Mattila et al., 2011, p. 223)

Each bag was given a carbon footprint range based on a number of variable uncertainties examined by the report, the full list of which can be found in the paper (Mattila et al., 2011, p. 221). While the cotton bags had a carbon footprint range similar to that of paper bags, the median footprint of cotton was the lowest of the three options (Table 5). In addition, the study also determined the probability that one bag type is superior to another bag (Table 6).

[3] The numbers used in the table were approximated from a chart published with the findings

Bag Type	LDPE	Paper	Cotton
LDPE		20	22
Paper	80		44
Cotton	78	56	

Table 6: Probability of Bag Superiority (Mattila et al., 2011, p. 223)

Table 6 shows the probability that the bag listed in the row is superior to the bag in the column. Therefore, according to the Finnish study, there is a 78% chance that cotton bags are better than LDPE plastic, but only a 56% chance that cotton bags were better than paper bags. However, the study also concluded that "if average-weight cotton bags were used more than 200 times…they were superior to paper bags in all plausible ranges of uncertain variables" (Mattila et al., 2011, p. 223). This means that with more uses, the reusable cotton bag decreases its environmental costs. Additionally, while the Finnish results are valuable, some of the environmental costs for plastic and paper bags were avoided due to energy credits for incineration, a practice not currently in widespread use in the United States. It can be inferred that without those environmental credits, all bags would increase in environmental costs, but especially paper and plastic as more of those bags are disposed of on a regular basis.

California Study

The final study surveyed was a report performed by California State University (CSU) for Keep California Beautiful, an environmental non-profit organization (CSU, 2011). The goal of this LCA was to determine whether or not reusable plastic (PP) bags were better for the environment than single-use HDPE bags and single-use paper bags (CSU, 2011). The study began by examining three other major studies, but then garnered much of its primary data from Californian plastic bag manufacturers, shopping bag use habits of California, and American end-of-life scenarios. The study analyzed four bag options, three of which are included in this research:

HDPE bags, reusable PP bags, and paper bags. Probably because of the goal of the report, the study did not include cotton bags, even though they are readily available to American shoppers.

The study included reusable bag maintenance (i.e. washing) and excluded using single-use bags in place of garbage liners. Additionally, the end-of-life scenarios were presented as: HDPE bags – 5% recycle, 94.5% landfill; PP bags – 95.5% landfill; and paper bags – 10 -40% recycle and 60-90% landfill. Finally, the study evaluated the relative costs of 1500 HDPE bags to 1000 reusable PP bags and 1000 paper bags. Additionally, the reusable PP bags were evaluated regarding their environmental costs at one use, 8 uses, and 52 uses (i.e. one year).

Table 7 shows the results of the California study. While reusable PP bags that were used only one time had higher environmental costs that single-use HDPE bags, according to the study the eighth use is the "environmental crossover" (CSU, 2011, p. 23). Therefore, if a reusable PP bag is used eight times or more, it becomes better for the environment that any single-use shopping bag. Additionally, as can be seen from the table, the more times the reusable bags are used, the fewer environmental costs they incur.

Bag Type	**Mass (g)**	**Fresh Water Use (gal)**	**Solid Waste (kg)**	**GHG (Co_2 eq)**	**Non-renewable energy (MJ)**
HDPE	6	58	7.0	0.04	763,000
Reusable PP (1x)	42	426	34.3	0.262	3,736,000
Reusable PP bag (8x)	42	85	4.29	0.033	467,000
Reusable PP (52x)	42	216	0.7	0.005	72,000
Paper	52	1,000	34	0.08	2,620,000

Table 7: Californian LCA Results for Bag Options (CSU, 2011, p. 19)

Conclusion

Many questions still remain as to which type of reusable bag is the most sustainable – cotton, reusable plastic, hemp, or something else entirely. Current studies suggest that reusable plastic (PP) bags have less of an environmental impact than cotton bags (Muthu et al., 2011; Muthu et al., 2010; Nolan, 2002). This may be because of a failure to differentiate between renewable versus non-renewable raw resources (i.e. renewable cotton versus non-renewable petroleum based polypropylene).

Additionally, other harder-to-quantify impacts of single-use plastic bags further support the idea that non-plastic bags are superior. Plastic shopping bags stay in the litter stream anywhere from 400 to 1,000 years (Aldred, 2008; Clapp and Swanston, 2009). Even when these bags do degrade, they photodegrade, so when exposed to the sun's rays, the bags degrade into smaller and smaller pieces of plastic (Clapp and Swanston, 2009; Paper or plastic, 2008). Because no animal is capable of digesting plastic (Paper or plastic, 2008), scientists have expressed concern regarding the integrity of the food chain and water quality as plastic bags accumulate in the environment (Weisman, 2007). Therefore, any further LCAs need to better quantify the long-term impact of both choosing renewable versus non-renewable resources and the environmental costs of plastic shopping bag litter, including reusable plastic shopping bags.

However, within the scope of this thesis, it was determined that all five of the studies surveyed came to the same conclusion – reusable bags are the most sustainable shopping bag option as long as they are actually reused. The environmental impact of reusable bags is inversely proportional to the bag's lifespan, carrying capacity, and usage rate. In other words, how long the bag can be used, how much the bag can hold, and how often individuals reuse the bag all decrease the environmental costs. Therefore, promoting consistent and regular reusable

shopping bag use amongst the general populace will lead to overall environmental benefits including decreasing the resources consumed, energy used, and greenhouse gases emitted. The next chapter will examine the successes and failures of shopping bag legislation, which is intended to discourage single-use shopping bag consumption (especially plastic bags), in order to assess the factors involved in creating effective behavior change.

CHAPTER THREE: Shopping Bag Legislation and Social Marketing

Since 2000, numerous governments, both local and national, have regulated (or tried to regulate) single-use shopping bag distribution and consumption (Clapp and Swanston, 2009; Clean up Australia, 2010; Florida Department of Environmental Protection [FDEP], 2004; Miller, 2011). This is because of a growing awareness of the unnecessary environmental consequences and health costs associated with single-use shopping bags, especially plastic bags (Miller, 2011). Also, because of "a near complete absence of established solid waste management infrastructure and recycling facilities," (Clapp and Swanston, 2009, p. 317) developing countries in Africa and Asia have led the way in passing and enforcing bag legislation.

There are three general types of bag legislation, which can be implemented alone or combined: (1) charging a tax or requiring retailers to charge a fee for the use of plastic or paper bags, (2) banning the thinnest plastic bags, usually 30 microns or less, and (3) outright banning plastic shopping bags all together (Clapp and Swanston, 2009; Clean up Australia, 2010; Miller 2011). However, any legislation can be difficult to pass and many jurisdictions have been unable to effectively regulate single-use shopping bags. Therefore, this chapter will examine the history of bag legislation and determine the factors that contribute to bag legislation success.

Shopping Bag Legislation around the World

In 1999, Bhutan in south Asia became one of the first countries to ban plastic shopping bags (Clean up Australia, 2010). Bangladesh, meanwhile, had been trying to ban plastic since the 1990s (Clapp and Swanston, 2009). It finally did so in 2002 when the government banned plastic bags from its capital, Dhaka, to combat clogged waterways, reduce water-borne illness, and fight

the rubbish problem (He, 2012). The ban was then expanded to include the entire country in 2007 (Clapp and Swanston, 2009). Also in 2002, Taiwan implemented a ban on thin plastic bags and a fee for the thicker bags (Lam and Chen, 2006). The ban was partially retracted in 2006 for the fast food sector due to food safety concerns (Clapp and Swanston, 2009). These regulations have been followed by a 2008 ban-fee combination in China (He, 2012) and a 2009 ban in Myanmar (Clean up Australia, 2010).

In 2003, South Africa became the first African country to enact bag legislation when it banned plastic bags less than 30 microns thick and required retailers to charge a fee for thicker bags (Dikgang, Leiman, and Visser, 2012). While the ban in Africa was controversial and received a great deal of resistance from the industrial sector (Miller, 2011), it has been reported that the country has seen an overall 44% decrease in plastic bag consumption (Dikgang et al., 2012). Plastic bag use, however, has begun to increase again as consumers become accustomed to the charge (Dikgang et al., 2012).

Rwanda also began looking at plastic bag consumption in 2004 (Kohls, 2011). Their research led to a 2005 national day of cleaning called *Umuganda* (Kohls, 2011) and a partial bag ban was passed in 2006. A total bag ban followed in 2008 (Clean up Australia, 2010). The country is now regarded as the cleanest country in Africa and one of the cleanest countries in the world (Kohls, 2011). Since then, Kenya, Ghana, Uganda, Tanzania, and Ethiopia have all banned or attempted to ban plastic bags (Clapp and Swanston, 2009) with varying degrees of success. For example, Kenya and Uganda have had difficulties in enforcing their bans and decreasing plastic bag consumption and waste (Clean up Australia, 2010).

In contrast, while Africa and Asia have favored partial or total bag bans, Europe has preferred bag taxation (Clapp and Swanston, 2009). In 2002, Ireland implemented one of the first

national levies against plastic bags (Convery, McDonnell, and Ferreira, 2007). In its first year, the levy required a 15 Euro cents per bag tax (Miller, 2011). Since then the tax has been increased two times; first in 2007 when it was raised to 22 Euro cents per bag and then again in 2009 when it was doubled to 44 Euro cents (Clean up Australia, 2010). Overall, it has reduced plastic bag use by 90% in Ireland (Convery et al., 2007). Since then Israel, Spain, Denmark, and Belgium have all begun to tax plastic shopping bags (Clapp and Swanston, 2009; Miller, 2011).

Bag Legislation in the United States

In The United States, very little peer-reviewed research has been done on bag legislation. Therefore, this section will derive much of its information from news articles, government resources, and non-profit organizations. Nationally, a "Plastic Bag Reduction Act" was introduced in the U.S. Congress, which would have placed a 5 cent fee on single-use shopping bags (Clean up Australia, 2010; FDEP, 2012). It never left committee and therefore, failed to pass (Clean up Australia, 2010; FDEP, 2012).

So far no state has been able to successfully pass a bag ban or fee (Clapp and Swanston, 2009; Llanos, 2012a), although several have tried including Arizona, California, Connecticut, Missouri, Nevada, and Rhode Island (Clean up Australia, 2010; FDEP, 2012). However, Hawai'i has a de facto state ban because each county has separately enacted legislation banning plastic bags (Llanos, 2012a). Therefore, while the state legislature has not been able to pass a bag policy (FDEP, 2012), by 2015 (when Honolulu County's ban will start being enforced), the state will effectively be the first state to have completely banned plastic shopping bags from check-out (Llanos, 2012a).

San Francisco became the first American city to enact a plastic bag ban in 2007 (Clapp and Swanston, 2009). In addition to banning conventional plastic bags, it set a minimum fee of 10 cents for allowed shopping bags including certified compostable plastic and recycled paper bags (San Francisco Department of the Environment, n.d.). This ban has recently been expanded to include all retail stores and restaurants (Finz, 2012). Since then, California towns have led the way for bag legislation in the United States. Over 40 different California cities have banned plastic bags from grocery stores (FDEP, 2012; Llanos, 2012b; Save the Bay, 2013). This includes Los Angeles, which became the largest American city to ban plastic bags and like many of the other Californian cities, voted to charge a fee on paper bags as well (FDEP, 2012; L.A. Now, 2012).

Outside of California, bag legislation attempts have gotten mixed results (FDEP, 2012). While there is no definitive list on bag legislation in America, according to one non-profit dedicated to protecting the oceans, cities in at least 15 different states (including California and Hawai'i) have passed some form of bag legislation (Surfrider Foundation, 2013). The bans in these jurisdictions have ranged from bag fees, plastic bag bans, and a bag-fee combo as preferred in San Francisco (FDEP, 2012). For example, in Maryland, Montgomery County passed legislation in 2012 that places a 5 cent fee on single-use plastic and paper bags (Montgomery County Government, 2013). As for plastic bag bans, Brownsville in Texas, the Outer Banks islands in North Carolina, Portland in Oregon, and five cities in New York have all banned plastic bags (FDEP, 2012; Galbraith, 2011; Koch, 2010). Finally, five cities in Colorado have implemented a ban-fee combo (FDEP, 2012) and most recently, Austin, Texas has approved a ban that will eventually prohibit both single-use plastic and paper bags (Coppola, 2012).

However, there have been some failures. In Washington D.C. bag legislation was only passed after it was reduced from a plastic bag ban to a 5 cent fee on plastic and paper shopping bags (FDEP, 2012). In Philadelphia, proposed bag bans failed to pass in both 2007 and 2009. In 2012, the effort was being revived by local non-profit groups (Dunn, 2012). A proposed bag ban also failed in Dallas (Wilonksy, 2008). While new ban legislation has been introduced at the city level in Dallas, a state senator has also introduced the Shopping Bag Freedom Act, which would not allow cities to ban shopping bag distribution or consumption in the state (Rosenthal, 2013). Cities in other states including Boston and Annapolis have also failed to pass proposed legislation (FDEP, 2012).

Bag Legislation in Washington State

Cities in Washington State have recently been successful in proposing and passing bag legislation. Eight different cities have voted to pass bag legislation with the most popular regulation being a bag-fee combo (FDEP, 2012). Edmonds became the first city in the state to ban plastic shopping bags in retail stores, a policy that took effect in 2010 (Thompson, 2009). Seattle also tried to regulate shopping bags in 2009 with a 20 cent bag fee, but it was ultimately defeated during a city-wide vote when the plastic bag industry spent over a million dollars to build opposition (FDEP, 2012; Yardley, 2012).

Then in 2012, Bellingham passed an ordinance that bans plastic bags and charges a 5 cent fee for paper bags (Pailthorp, 2012). Six months later, with a grassroots movement led by non-profit groups like the Seattle Green Bag Campaign, Seattle proposed and passed similar legislation, (Pailthorp, 2012; Yardley, 2012) as did Bainbridge Island, Issaquah, Mukilteo, and Port Townsend (FDEP, 2012; Pailthorp, 2012). Shoreline followed suit in 2013 (City Manager's

Office, 2013) and Olympia's city council has recently voted to support a proposed bag ban for Thurston County (Batcheldor, 2013).

Comparative Analysis of Effective and Non-Effective Bag Legislation

As the above section indicates, while there have been several successes regarding shopping bag legislation, there have also been many failures. Additionally, as countries like Kenya and South Africa show, simply passing legislation does not guarantee success in changing behavior. In the end, there are several factors that are necessary to consider for ensuring the success of legislative measures.

The first factor is political will. No American state has been able to pass ban legislation even though several, including California and Colorado, have tried (FDEP, 2012). Kenya passed a ban on plastic bags thinner than 30 microns and a tax on the thicker bags (*East African*, 2011). However, Kenya is home to the largest plastic bag manufacturing companies in Africa, which makes for a powerful pro-plastic bag lobby (Njeru, 2006; *The East African*, 2011). Therefore, the ban was never actually implemented or enforced and has largely been seen as a failure (*The East African*, 2011). Five years after the ban, plastic shopping bags are still found all along the roadways and given out at every roadside stand.[4] Without political will, even passed legislation will have no force or strength to ensure compliance and make an impact.

This leads to the second factor in ensuring bag legislation success – popular support and citizen involvement. Ultimately a legislative body wants to pass policies that are popular with their constituents and are more willing to take chances when they feel they have the support of the public. For example, by instituting national clean up days, Rwanda made sure that its local populace became sensitized to the country's rubbish problem and how plastic bags contributed to

[4] This is a personal observation based on an educational trip taken to Kenya in 2012

that problem (Kohls, 2011). This helped Rwanda pass enforcement measures as part of the ordinance; officials now confiscate plastic bags upon entry into the country and occasionally on public streets (Kohls, 2011). As Dr. Rose Mukankomje explained, "You need a policy to get rid of plastic bags, but it must be wanted to be successful" (as cited in Kohls, 2011). By drawing attention to the vast amounts of plastic bag litter in Rwanda, the government was able to build enough support to overcome resistance in the private sector, including retailers and the plastics lobby (Kohls, 2011).

However, in order to garner public support, a jurisdiction needs to dialogue with its community to address perceived concerns and preferences. In São Paulo, Brazil, a ban was passed in 2012. However, almost immediately, the private citizenry began to protest, arguing that they were being cheated by grocers and needed the plastic bags for secondary use as garbage liners (Moser, 2013). Because many Brazilians already carry small cloth bags or carts to produce fairs, the São Paulo government assumed the transition would occur easily, but without dialoging with the populace regarding their needs and opinions, the ban has had to be delayed to permit gradual enforcement over an unspecified timeline (Moser, 2013). As social marketing points out, it is easy to assume community opinion and responses and it is just as easy for those assumptions to be wrong (McKenzie-Mohr, 2011). If São Paulo had taken the time to pre-engage with their community, they might be fielding less constituent complaints now.

In contrast, because American bag legislation mostly happens at the city level, advocacy organizations are created prior to bag legislation to ensure community support and safeguard legislation passage. In California, Hawai'i, and Washington specifically, these organizations ensure the building of momentum and social norms that allow more cities and jurisdictions to take action and pass policy (Pailthorp, 2012). For example, by building off San Francisco's

success, Save the Bay has now been able to get bag legislation passed in over 40 different districts and cities (Llanos, 2012a; Save the Bay, 2013). In Hawai'i, the Sierra Club conducted a two-year campaign to make sure each of the four counties passed bag legislation, while Surfriders worked to connect plastic bag waste to Hawai'i's beaches and oceans, an important subject for the state's residents and local businesses (Llanos, 2012a).

By pre-engaging with their community, the Seattle Green Bag Campaign and other advocacy groups were also able to pass a bag ban only two years after voters rejected it. Additionally, they guaranteed the success of not just the legislation, but also community commitment and behavior change. Within one year of the ban's enactment, one survey found that 64% of consumers agree with the ban and 54% reported that the ban has already encouraged them to bring their reusable bag more often (Jornlin, 2013). These numbers and the success of bag legislation in Seattle and Bellingham have given rise to at least five more ban-fee policies in the state.

Finally, the goal of bag legislation needs to be clear. In Africa and Asia, the plastic bag is seen as causing floods by clogging waterways, contributing to water-borne diseases, and affecting valuable livestock (Clapp and Swanston, 2009; Clean up Australia, 2010; Miller, 2011; Njeru, 2006). Therefore, in Africa and Asia, the primary goal is to reduce plastic bag waste. For this reason, paper bags, which are biodegradable and not toxic to animals, are not a major concern and Rwanda, China, South Africa, and others regard the bans as a success if plastic bag use is reduced.

However, in Europe and the United States, which have well organized waste management infrastructure, bag legislation is seen as counteracting our wasteful, overly-consumptive lifestyles and lessening our environmental footprint (Llanos, 2012b; Miller, 2011; Yardley,

2011). Therefore, success cannot be measured by the reduction of plastic bags alone. Simply banning or taxing plastic bags doesn't ensure a switch to reusable shopping bags (Llanos, 2012a; Miller, 2011). Instead many shoppers are likely to switch over to single-use paper shopping bags (Llanos, 2012a), which have their own, possibly greater, environmental costs. This is why many cities in the United States are beginning to ban or tax paper bags as part of their legislation. Whether it is Austin, Texas banning paper bags as well as plastic (Coppola, 2013), or the more common method of banning plastic and requiring a fee for paper (FDEP, 2012), American cities are realizing that to have the desired environmental impact they have to address all single-use shopping bags, not just plastic bags.

Therefore, in order for shopping bag legislation to be successful, its proponents have to have a clear goal in mind and need to directly target and engage with the local community to build behavior change and support in order to build the political will necessary to achieve that goal. In the United States, the goal is to help an overburdened, busy populace regularly use readily available reusable shopping bags instead of single-use paper or plastic bags. The next chapter will research possible ways achieve that goal.

CHAPTER FOUR: Social Marketing to Encourage Sustainable Behavior

Chapter One argued that the environmental sustainability paradigm can offer a powerful response to the economic-consumption paradigm, which has failed to ensure long term human happiness and environmental conservation; and that replacing single-use disposables like shopping bags with durable reusables is an important component in achieving the sustainability paradigm. However, because environmental philosophers and researchers are not creating a society out of nothing, major challenges remain in finding ways to develop the sustainability ethic and lifestyle. Therefore, a major problem for sustainability proponents is how to encourage sustainable behavior when private citizens live in a society that promotes consumerism and rewards waste. This chapter will address that challenge, analyzing several behavior change theories and presenting social marketing as the best method to build long-lasting sustainable behavior.

How Do You Encourage Sustainable Behavior?

The answer to the above question is multi-faceted. Society is co-evolutionary (Norgaard, 1988), which means that the different components of society bounce off each other in interesting ways. Each social subsection (private citizenry, government, business, etc.) regularly affects and responds to the other subsections. For example, governments have created laws limiting the amount of alcohol that one can consume before driving a car, but these laws were successful in part due to private citizenry groups like Mothers Against Drunk Driving (MADD) who altered public perception of the dangers of drunk driving (Davies, 2005). In addition, because of increased public concern regarding drunk driving, many liquor companies now have added

warnings to their commercials advising against drinking and driving. This is co-evolution in practice: the private citizen group MADD affected government and businesses, which in turn affected private citizens.

Therefore, while there needs to be both government regulation and major changes made to business, there also needs to be direct appeals to the private citizen. This is for two reasons. First, "with nearly 300 million people living in the United States, small across-the-board changes in behavior can have a huge impact" (NEETF, 2005, p. 33). This is especially important as many pollution problems are increasingly the result of personal consumption and individual action (NEETF, 2005). Second, as the non-profit sector has shown, private citizenry, when channeled and activated, can have major effects on the other social subsections (Worth, 2012).

Shopping bags encapsulate both reasons. Shopping bags are a consumer packaging product – manufactured and distributed for individual use and disposal. Much of the environmental consequences of shopping bags (see Chapter Two) come from the fact that individuals consume so many single-use shopping bags each year; Americans alone consume and dispose of 10 billion paper bags and 100 billion plastic bags. Additionally, both government and business respond to what they believe is the desire of their constituents or consumers. For example, as detailed in Chapter Three, Seattle's Green Bag Campaign built community support for a plastic bag ban-paper bag fee in the city; this community support was a major reason the ban-fee legislation passed (Yardley, 2012). This legislation's passage and enforcement will, in turn, affect how many bags are used by consumers and made by plastic and paper manufacturing companies.

But how are private citizens or communities reached and affected? Is it changing their attitudes and minds by teaching individuals and communities about the dangers to the planet and

giving tips for how to live their lives? No; according to Coyle (NEETF, 2005), research has consistently shown that while "there is a positive relationship between environmental awareness and knowledge, on the one hand, and attitudes and behaviors on the other… awareness…does not by itself bring about lasting change" (p. 38). For example, when trying to increase water conservation, researchers developed both informational pamphlets and "attunement labels" (Kurz, Donaghue, and Walker, 2005). While the information was the same on both the pamphlets and the labels, the labels were specifically designed for use with each particular appliance (for example, the shower labels were waterproof and had digital clocks attached in order to help individuals monitor the time spent showering). The pamphlets were found to have no effect, but the labels helped reduce water use by 23 percent (Kurz et al., 2005). Information alone wasn't enough to induce behavior change, but targeting the behavior at the actual point of interaction, the researchers were able to increase water conservation (Kurz et al., 2005).

Instead, is the correct method for encouraging behavior change one in which the individual is perceived as a highly logical person strongly influenced by economic motives? Again, the answer is no. Many programs that follow this theory find little to no results in behavior change (McKenzie-Mohr, 2000). Researchers have found the reason for this failure is while economic motives can play a part in the decision-making process, there are numerous other factors that affect how people behave (Kennedy, 2010; NEETF, 2005; Schulz, 2002; Tabanico and Schultz, 2010), Cultural norms, convenience, the desire to belong, traditions, and habits can all be important factors in behavior and behavior change (Andreasen, 1995; Carrigan, Moraes, and Leek, 2010; McKenzie-Mohr, 2011; NEETF, 2005).

Therefore, in order to change behavior, a program has to have a number of different tools that can respond to these different factors. Sometimes, as with turning off the car to reduce

unnecessary idling, people simply forget because it is not their habit. In other instances, like taking public transportation instead of driving, it may be a perception of convenience. A good behavior change method needs to have a way of learning the barriers to performing the sustainable behavior and how-to address those barriers in order to induce long-term change. Social marketing is such an approach.

The Definition of Social Marketing

Social Marketing is a method that has been viewed as a distinct field since the 1970s (Kotler and Lee, 2008; Kotler and Zaltman, 1971). According to Kotler and Lee (2008), "social marketing is about influencing behaviors…it utilizes a systematic planning process and applies traditional marketing principles and techniques…to deliver a positive benefit for society" (p. 8) Social marketing means using the lessons of traditional marketing (how to influence people and gain societal traction) to pursue a greater good like reducing smoking or increasing recycling rates in order to redress a wide variety of social ills. Instead of selling a commodity or service to the public, the social marketer sells a change in behavior; and instead of benefiting the corporation or stockholder, the social marketer seeks to benefit the public and society (Andreasen, 1995; Kotler and Zaltman, 1971). Additionally, there are three main principles of social marketing that make it different from other non-profit or public sector methods: (1) behavior change is voluntary; (2) behavior change requires replacing an old, undesirable behavior; and (3) community engagement and communication are paramount to long-term change (Kotler and Lee, 2008; McKenzie-Mohr, 2000).

Principles of Social Marketing

First, the main goal of social marketing is *voluntary* behavior change (Kotler and Lee, 2008). While the behavior change may lead to new government ordinances or business practices, social marketing is specifically focused on how to encourage individuals and groups to change their behavior without coercion. For example, in order to protect the planet's water supply and save money on utilities, many hotels are encouraging their guests to re-use towels and bed sheets more than once. Instead of requiring guests to do so, the hotels are experimenting with different signs and reminder flyers to promote the behavior change. The most successful signs connect the individual back to the larger hotel community by asking patrons to " 'join your fellow guests' " and even listing the specific percentage of guests who choose to reuse their towels (McKenzie-Mohr, 2011, pp. 66-67). The idea is that the social marketer is trying to work with the group – learning to understand its norms, motivations, habits, and challenges in order to foster voluntary change within the group.

Additionally, even with regulation or coercion, there can never be enough inspectors or checkpoints to force long-reaching compliance. For example, the National Highway Traffic Safety Administration (NHTSA) implemented the "Click it or Ticket" campaign as a way to increase seat belt use and decrease traffic fatalities or injuries (Kotler and Lee, 2007). While the campaign has advocated for the adoption of seat belt laws, seat belt checkpoints, and strict ticket enforcement, it also recognized the limited ability of a thinly stretched police force to make private citizenry "click it." Therefore, the campaign followed many of the steps and principles of social marketing. It has conducted surveys, promoted advertising activities, and partnered with local companies and schools to understand the barriers of different demographic groups and to help induce voluntary change. These efforts have helped increase the seat belt use rate to a

national high, 80 percent (Kotler and Lee, 2007). Since social marketing has convinced more people to voluntarily "click it," there can now be fewer checkpoints, less police on seat belt duty, and fewer regulators to mandate compliance.

Second, social marketing recognizes that behavior change is two-fold – you have to reduce an old, negative behavior while increasing a new, positive behavior (Kennedy, 2010; Tabanico and Schultz, 2007). While this may seem obvious, it is important to note because many times the barriers to behavior change are not in the new behavior itself, but instead in the old behavior. Therefore, the social marketer has to research what makes the old behavior so hard to break. For example, one research study showed increasing energy conservation by switching off lights when leaving the room requires focusing on the old behavior – the habit of leaving on the lights (de Vries, Aarts, and Midden, 2011). A social marketing campaign would need to break the old, leaving on the lights habit in order to build a new sustainable behavior. Therefore, the social marketer has research the root causes of the old behavior in order to predict and respond to challenges presented when trying to replace that behavior.

Finally, social marketing recognizes the need to engage and dialogue with the target community (Kennedy, 2010). This principle is of particular importance to community-based social marketing (CBSM), which was designed by Doug McKenzie-Mohr in order to address "concerns about the ineffectiveness of environmental campaigns that relied solely on providing information" (Kollmuss and Agyeman, 2002, p. 240). According to CBSM, many social campaigns fail because they assumed an understanding of barriers and causes (Kennedy, 2010). Instead of dialoguing with the community, many campaigns talk at the community and in doing so can spend countless time, money, and resources on a marketing strategy that has limited to no success (McKenzie-Mohr, 2000).

For example, when attempting to decrease unnecessary home water use, it might be assumed that full-flush toilets (which use significantly more water than low-flush toilets) are the biggest water consumers in the neighborhood. However, after talking with the target community, it might be determined that shorter showers or timed sprinkler systems would have a greater impact in reducing home water use. Even if low-flush toilets are the correct answer, the barrier to increasing toilets may be financial, misinformation, disinterest, or something else entirely. Therefore, community engagement and dialogue can greatly increase the likelihood that a campaign will focus on the correct set of barriers and benefits the first time, thereby making behavior change efficient and cost-effective (Tabanico and Schultz, 2007).

In addition to the three principles outlined above[5], social marketing has different steps and strategies to help a campaign apply the principles to a specific issue and different authors organize the social marketing steps in different ways (Andreasen, 1995; Kotler and Lee, 2008; McKenzie-Mohr, 2011). Because CBSM's five steps are specifically designed to promote community engagement at each stage, that is the social marketing method used during the shopping bag case study.

The Steps and Strategies of Community-Based Social Marketing

Each step in CBSM is designed to research barriers, engage the target community, encourage behavior change, and evaluate success. The five CBSM steps are: (1) behavior selection, (2) barrier and benefit identification, (3) strategy development, (4) piloting, and (5) evaluation and broad-scale implementation.

[5] voluntary behavior change; focusing on removing an old behavior while encouraging a new behavior; and resisting assumptions by engaging with the community

Behavior Selection

As the goal of social marketing is to encourage behavior change, the first step in implementing a social marketing campaign is behavior selection. The behavior chosen ought to be "indivisible" and "end-state" (McKenzie-Mohr, 2011), which means it is a single behavior that actually leads to the desired environmental effect (Tabanico and Schultz, 2007). For example, if a social marketing campaign wants to reduce carbon emissions from idling cars, it should focus on the behavior that leads to drivers actually turning off the engine. This behavior is simple, it is doable, and it directly impacts the amount of carbon emissions being released into the air. Therefore, the social marketer should research behaviors related to desired outcome and dialogue with the target community to determine which behavior would have the most impact.

In fact, the behavior selected should not just be high impact, but also have a high probability for success, and low penetration in the community (McKenzie-Mohr, 2011). In other words, the social marketer is looking for a behavior that will have meaningful influence without being too difficult to achieve and without having already been adopted by community members. For example, a social marketing campaign was begun in Nepal in order reduce the spread of HIV/AIDS (Kotler and Lee, 2007). The behavior selected to encourage was condom distribution because research had shown that increased condom use greatly reduces the spread of the disease and there was a high chance the Nepalese community would use condoms, but that condoms were not readily available in many needed locations, i.e. stores and dances clubs weren't already distributing them to customers (Kotler and Lee, 2007). Therefore, through research and dialogue, the campaign knew that condom distribution would be a high impact, high probability, and low penetration behavior on which to focus.

Barrier and Benefit Identification

After selecting the behavior, the next step is determining the barriers to behavior change and benefits that would motivate individuals to act (Carrigan et al., 2010). The process in this stage is similar to the process undergone during behavior selection: research and dialogue. In CBSM, dialoguing with the target community can be done in three ways: extended interviews (either phone or in-person), focus groups, or surveys (McKenzie-Mohr, 2011). Choosing which of the methods to employ is a matter of personnel, time, and finances (McKenzie-Mohr, 2011). However, for all methods, the goal is the same: to determine barriers to behavior change, learn how to remove those barriers, and find ways to encourage the new, desired behavior (Kotler and Lee, 2007).

For example, Walton and Sunseri (2010) researched the factors in influencing the decision to drive or walk to public transport stations. They discovered that convenience of a free car park and weather inclemency were the two important factors that increased likelihood of driving to the station, while fear of crime, time concerns, or carrying goods were not significant factors (Walton and Sunseri, 2010). Therefore, any future social marketing campaign now knows that to have a significant impact in that community, the free car park and weather will have to be addressed. Without the survey and without pre-identifying barriers and benefits, a campaign could spend a lot of time and money emphasizing the low crime rate to community members without realizing that focus alone would have limited success.

Strategy Development

Research has shown a major problem in building sustainable behavior is that “people don't always know what to do to benefit the environment, and they often feel that small personal

sacrifices won't mean anything when compared to the responses of a company or public institution" (NEETF, 2005, p. 33). Not knowing which specific actions will lead to environmental change or how those actions are connected back to the larger culture are two big reasons that knowledge and awareness don't produce behavior change (Kollmus and Agyeman, 2002; Tabanico and Schultz, 2007). For example, one study on recycling programs showed that action-oriented knowledge (when, where, and how to recycle) plus norm building (i.e. the belief that other community members were also participating in the program) led to the most long-term behavior change (Schultz, 2002).

Therefore, CBSM has developed seven sub-strategies, each of which seek to reduce barriers to change by connecting the sustainable behavior back to specific actions and the community (Carrigan et al., 2010; Kennedy, 2010). First, *commitment* helps motivate individuals from good intentions to action. Then, there are *social norms* and *social diffusion*, designed to build community support and speed up the adoption of new behaviors. *Communication* teaches how to build effective messages that target the audience; and finally, *incentives* and *convenience* help enhance the motivation to act and make it easy to act. To make a campaign the most effective, it is important to use several of the sub-strategies and they can be combined and employed in many different ways (McKenzie-Mohr, 2011). Therefore, the different sub-strategies will be detailed further in Chapter Five when I explain how CBSM was adapted for the reusable shopping bag case study.

Piloting

Piloting means to run the campaign on a smaller scale in order to further guarantee success (Tabanico and Schultz, 2007). The purpose of the pilot is to ensure that the strategies chosen and

materials/activities designed will encourage behavior change, as well as to allow the social marketer to revise the strategies and materials if needed. While this stage is the hardest to complete due to time, personnel, and financial limitation (McKenzie-Mohr, 2011), attempting some type of pilot is recommended in order to assure that the behavior will be changed in a cost-effective and meaningful manner.

Evaluation and Broad-scale Implementation

As social marketing is an attempt to change behavior, a campaign isn't complete until it is determined if the behavior has actually been affected. The two components to this step are community dialogue and empirical data collection (Carrigan et al., 2010; Kurz et al., 2005). As with barrier identification, community dialogue can either be interviews, focus groups, or surveys. Each of these techniques requires some form of self-assessment by the participants because the purpose is to determine how the community members perceive the campaign and its components (McKenzie-Mohr, 2011).

While self-assessments are inherently skewed, it is still an important evaluation tool. This is because while empirical data collection can show the quantifiable effects of behavior change, the survey, focus group, or interview will help pinpoint the specific strategies that did or did not work (Kotler and Lee, 2008). For example, when trying to increase curbside recycling rates, counting the number of filled recycling bins on trash day can give hard data on how many houses are now recycling that weren't before the campaign. However, community dialoging will help determine if a commitment, a financial incentive, or educational materials was the most effective in encouraging the change. Therefore, as much as possible, the two components should be combined.

Finally, the campaign will be implemented on a broad-scale only after it has been evaluated and, if necessary, revised and re-piloted (Tabanico and Schultz, 2007). This is to confirm that a broad-scale program will have a high chance of success and value. By going through all the steps, there is assurance that not only will behavior be changed, but it will happen in a cost-effective and timely manner.

Adapting Social Marketing for the Reusable Bag Case Study

Numerous studies have shown social marketing can be a valuable tool in changing behavior (Andreasen, 2006; Carrigan et al., 2010; de Vries et al., 2011; Kennedy, 2010; Kotler and Lee, 2008; Kurz et al., 2005; McKenzie-Mohr, 2011; Schultz, 2002; Tabanico and Schultz, 2007; Walton and Sunseri, 2010). From home water conservation (Kurz et al., 2005) to recycling (Schultz, 2002) and car idling (McKenzie-Mohr, 2011), CBSM has been proven to help busy individuals act more sustainably. However, while there are several news reports that address the environmental implications of shopping bags and shopping bag legislation (Arnoldy, 2007; Coppola, 2013; L.A. Now, 2013; Llanos, 2012a; Llanos, 2012b; "More than meets the eye," 2007; Roach, 2003; Rosenthal, 2013; Thompson, 2007; Yardley, 2011), there is little in terms of research on how to achieve customer motivation and shopping bag behavior change in the United States.

Additionally, both the local chapter of the Surfriders Foundation (a non-profit organization) and the Sustainable Tacoma Commission (STC) are interested in the possibility of pursuing a plastic bag ban or a reusable bag promotional campaign to reduce single-use shopping bag consumption in Tacoma, Washington. Therefore, the final part of this research focuses on a

reusable shopping bag case study that will add to the general body of research on shopping bag behavior as well as supply specific information on Tacoma's shopping bag use and barriers.

CHAPTER FIVE: Encouraging Reusable Shopping Bag Use at Stadium Thriftway

The objective of the reusable shopping case study was to determine if I could use the CBSM method to increase reusable shopping bag use at Stadium Thriftway. A campaign was designed to identify and eliminate barriers by engaging Stadium Thriftway and its customers. The goals of the campaign were twofold: (1) to learn which barriers to reusable bag use were affecting Thriftway shoppers and (2) to increase the use of reusable shopping bags by targeting and removing those barriers. In order to address both these goals, the campaign was, therefore, broken down into three stages: (1) barrier identification and behavior selection; (2) campaign strategy development; and (3) campaign implementation and evaluation. This chapter will outline the implementation, results, and conclusion of the campaign and case study.

First, the selection of the store and the case study qualifications will be discussed. Next, because the results of stage one (behavior identification and barrier selection) directly affected the creation and implementation of the behavior change campaign, stage one's methods and results will be outlined before discussing the next two stages. Then stage two (campaign strategy development) will be described, detailing how the campaign employed the tools of CBSM to remove the barriers identified during the first stage. Finally, the method and results of the third stage (campaign implementation and evaluation) will be analyzed, concluding that the evidence suggests that Stadium Thriftway customers did change their shopping bag behaviors and that CBSM was able to identify and target barriers to that change.

Selection of Stadium Thriftway Grocery Store

Stadium Thriftway grocery store, located near the corner of North 1st Street and North Tacoma Avenue at the edge of downtown Tacoma, was selected for a few reasons. First, the manager is very interested in promoting green practices at his store (M. Hargreaves, personal interview, October 18, 2012), which made him amenable to aiding my research whenever possible. For example, while he informed me that it was against store policy to allow me on store property, he allowed me to set up the booth right at the store property line whenever my research required it. This permitted me to perform my case study within clearly designed research parameters and with store support. Second, because Thriftway is a grocery store in an urban area, the store property line is relatively close to the store entrance, which let me complete the project while respecting store policy. Finally, Stadium Thriftway has only one store entrance. This meant that I had the opportunity to approach every customer as they entered or left the store.

Qualifications

The case study has several qualifications that impacted the campaign's design and operation. First, the entire campaign was managed and run by a single person, myself. While working closely with my thesis committee, Stadium Thriftway, the City of Tacoma's Office of Sustainability, and the Sustainable Tacoma Commission (STC) to garner feedback on materials used and procedures followed, I was solely responsible for creating and running the entire operation. This greatly limited the size and length of the campaign, as well as the number of community members reached. For example, this was a major factor in deciding to perform the study at a single grocery store and at Stadium Thriftway's entrance in particular. However, having only one researcher was a benefit as it ensured greater consistency when interacting with

the community and maintaining accurate tracking procedures. For example, all of the anecdotes mentioned in this chapter are directly from my personal experience and the field journal entries were all made by me.

Second, because I was unable to set up the booth under the storefront's awning, the weather became a major factor in my ability to operate the booth on particular days. For example, people were much less likely to stop by the booth on a rainy day and, more importantly, during inclement weather, many of the materials (especially the surveys) got too wet to be used. As much as possible I tried to minimize the effect the rain had on the booth, but when it adversely affected my ability to work, it was noted in the field journal.

STAGE ONE – BARRIER IDENTIFICATION AND BEHAVIOR SELECTION

There can be many potential factors affecting shopping bag behavior: reusable shopping bag cost, a desire to have single-use shopping bags for other purposes, lack of information, and forgetfulness are all possible barriers to increasing reusable shopping bag use. Therefore, before designing a reusable shopping bag behavior change campaign, the barriers particular to Stadium Thriftway customers have to be identified. For this case study, a preliminary survey was written and administered to identify these barriers. The method used and results garnered from this preliminary survey will now be discussed.

Method

In order to increase the likelihood of Thriftway shopper participation, the survey was limited to one double-sided page. The two main objectives were to learn if Thriftway shopping bag behavior is a good candidate for a social marketing campaign and to identify the barriers to

increasing reusable shopping bag use. In addition, because of the STC's interest in pursuing a possible plastic bag ban in Tacoma, a tertiary objective was to acquire preliminary information regarding public opinion on bag legislation. However, because the third objective is not related to the goals of the case study, those results are not discussed in this chapter, but can be found in Appendix 4. Finally, the survey was organized into four major topics: demographic information, customer shopping bag habits, barrier identification, and opinions on shopping bag laws (See Appendix 1).

Demographic information included questions regarding the grocery store habits of the respondents (Questions 1 to 3) in order to assess whether or not the Thriftway community (i.e. the regular Thriftway customer base) was being reached. Questions 4 to 9 addressed how respondents currently use shopping bags – for example, which type of bag is typically used, how many reusable shopping bags are owned, and how often the reusable bags are used when grocery store shopping. These questions sought to determine whether or not implementing a social marketing campaign to change shopping bag behavior would be useful at Stadium Thriftway.

Questions 10 and 11, and 15 to 17 focused on barrier identification. Questions 10 and 11 sought to pinpoint reasons reusable shopping bags were not being used and how reusable bag use could be increased. Meanwhile, Questions 15 to 17 specifically addressed levels of environmental concern and shopping bag awareness in order to determine if either was a major factor in shopping bag behavior change. Finally, Questions 12 to 14 sought information regarding public opinion on the recent Seattle shopping bag law and opinions on any possible law enacted in Tacoma.

The surveys were collected over a period of three days during one week – Monday, Wednesday, and Friday. In order to determine the best time of day to perform the behavior

change campaign, the surveys were divided into two shifts: the lunch shift (11:30-2:00) and the evening shift (5:00-7:30). Overall, a total of 164 surveys were completed; 81 for the lunch shift and 83 for the evening shift. After completion, each survey was marked with the shift and day collected, as well as given a unique number for tracking and evaluation purposes.

Results and Analysis

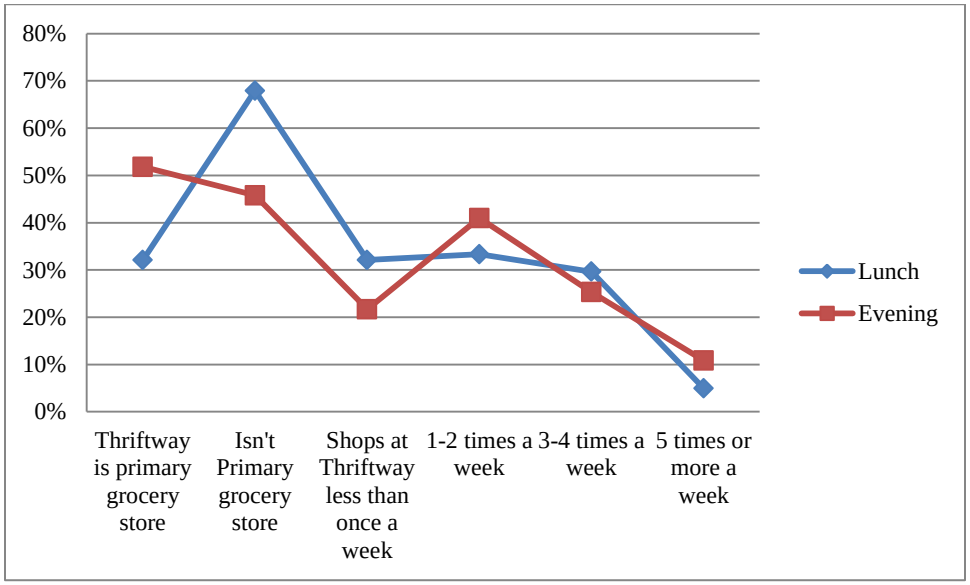

Figure 1: Demographic Differences between the Lunch and Evening Shifts

According to Figure 1, only 32% of the lunch shift respondents said Thriftway is the main grocery store they visit, while during the evening shift 52% said that Thriftway was their primary grocery store. Additionally, 11% more of the evening shift respondents said they shop at Thriftway least once a week. These differences are important because it confirms my expectation that the evening shift is more likely to be regular Thriftway customers. Therefore, the evening is the best time of day to implement a behavior change campaign that will successfully target the Thriftway community.

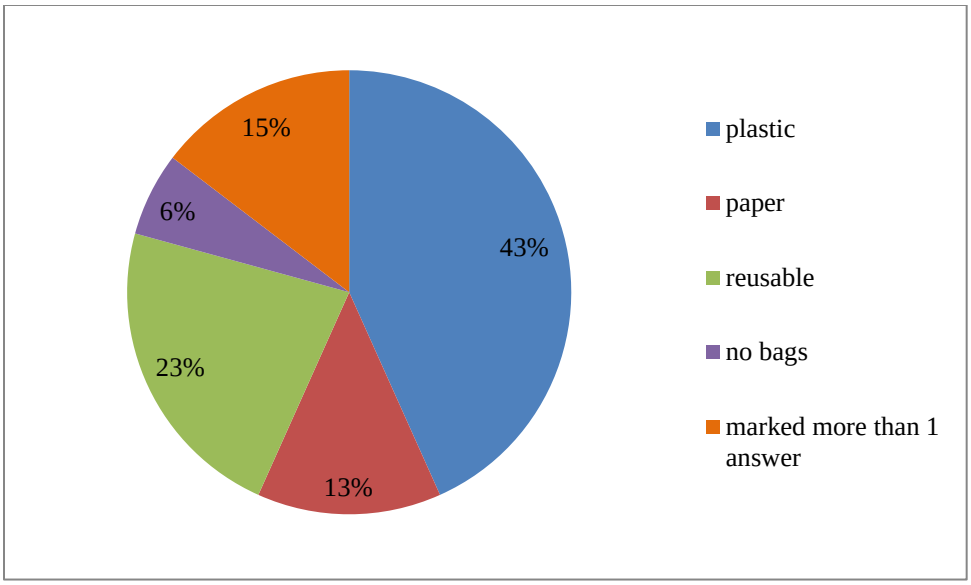

Figure 2: Types of Shopping Bags Typically Used by Thriftway Customers

The survey also determined that only 32% of respondents marked that they typically use reusable shopping bags when grocery shopping and 10% indicated they typically don't use a shopping bag. In contrast 74% said that they use single-use plastic or paper shopping bags. These statistics do not add up to 100% because almost 15% of the respondents chose more than one answer. However, as Figure 2 shows, even if you only look at shoppers who marked one answer, 43% said they typically use plastic shopping bags, while only 23% indicated that they typically use reusable shopping bags. This confirms that there is definite room for improvement in shopping bag behavior at Stadium Thriftway; while reusable shopping bags are available for sale at the store, well under half of those surveyed indicated regular use of reusable shopping bags. As such barriers to behavior change will now be identified.

Barrier Identification

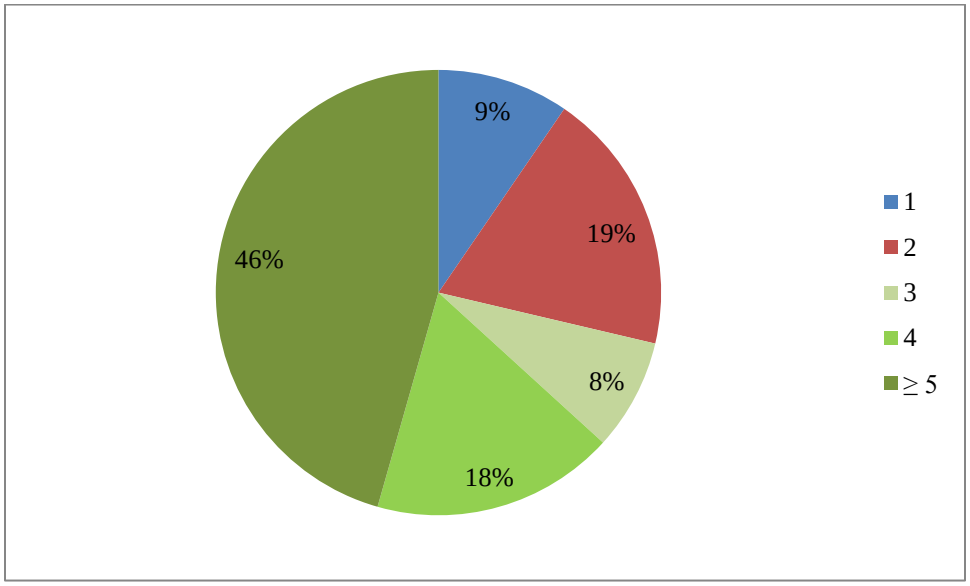

Figure 3: Number of Bags Owned by Shoppers Who Have Reusable Bags

81-83%[6] of the shoppers said that they owned reusable shopping bags, while only 16-17% indicated that they did not own a reusable shopping bag. In addition, as seen in Figure 3, 72% of the shoppers who owned reusable bags indicated that they had at least three bags and of shoppers who had at least three bags, 64% said they owned 5 bags or more. However, as Figure 4 shows, only 30% of the respondents who own bags indicated that they use their reusable shopping bags much or all the time. Therefore, failure to own reusable shopping bags is not a barrier to change, but instead the barrier is failure to regularly bring those bags to the store.

[6] The reason for giving a range is due to a discrepancy in how respondents answered questions 7 and 8 on the survey. In question 7, 81% of the shoppers said they owned reusable shopping bags, while in question 8, 83% marked an answer other than 0 shopping bags owned.

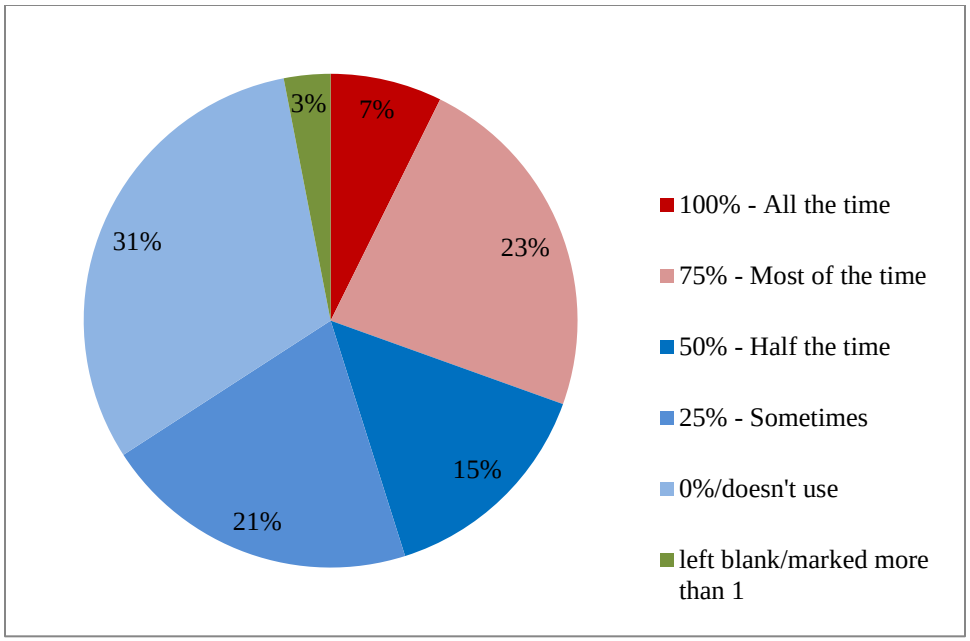

Figure 4: How Often Shoppers Use Reusable Bags

As Figure 5 shows, when asked why they don't use their reusable shopping bags, 75% said that one reason is because they forget their bags at home or in the car. Of respondents who forget their bags, 76% said they forget their bags at home, while 24% said they forget their bags in the car. The second most popular answer is "collecting single-use shopping bags for other purposes," which was selected only 26% of the time. Therefore, helping customers remember the bags they already own is the behavior that will have the highest impact and highest probability with the lowest community penetration.

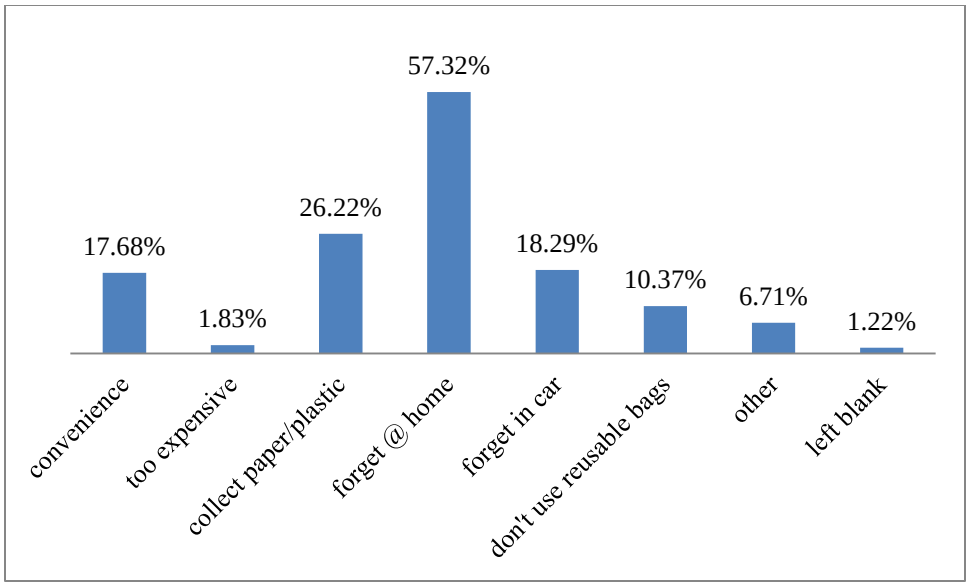

Figure 5: Reasons Why Shoppers Don't Use Their Reusable Bags

STAGE TWO – CAMPAIGN STRATEGY DEVELOPMENT

The goal of stage two was to adapt the tools of community-based social marketing in order to design a behavior change campaign that responded to the barriers identified from the results of the preliminary survey. The behavior selected for change is, *helping Stadium Thriftway customers remember to bring the bags they already own to the store*. Three campaign materials were created to encourage this behavior: (1) a "wheel of education," (2) a shopping bag pledge, and (3) a reminder sticker.

The wheel of education was titled "How Well Do You Know Shopping Bags." Because I could not be on store property, the biggest challenge of the campaign was finding a way to entice customers away from the store entrance to the campaign booth. Therefore, the main goal of the wheel was to capture shopper attention and engage their interest in the campaign; a secondary goal was to disseminate information on the environmental impacts of shopping bags.

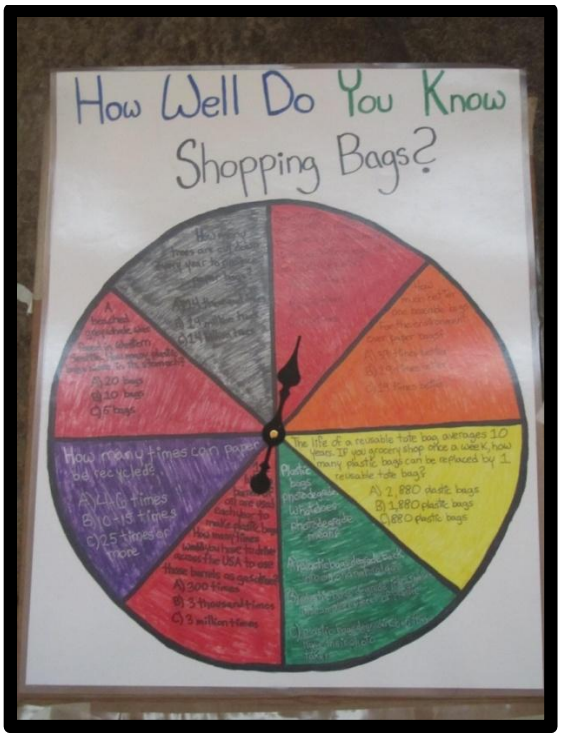

Photo 1: The Wheel of Education

As such the wheel was designed to be a fun, colorful activity (see Photo 1) that would peak shopper interest and engage both the body and mind (i.e. spin the wheel and answer a question). Additionally, in order to make the information "vivid, concrete, and personalized," as recommended by CBSM (McKenzie-Mohr, 2011, p. 95), as much as possible the questions created were easy to relate to and meaningful to the local community (Appendix 2-A). For example, one question referenced a specific whale found on a beach in Seattle with plastic bags in its stomach while another question showed how much better reusable bags are for the environment over paper bags. This way customers learned specific information about why remembering to use reusable bags is important to both the environment and their local community.

McKenzie-Mohr (2011) also writes about the importance of attaining a written commitment from community members. This is because "individuals have a basic desire to

remain consistent in their thoughts and actions" (Tabanico and Schultz, 2007, p. 43) so commitments help people view the issue as personally important. Therefore, the second campaign activity was asking customers to sign a pledge. The pledge stated that instead of using plastic or paper shopping bags, the customer will use reusable shopping bags when a bag was needed for purchases (Appendix 2-B). While I was unable to make the pledges public, I did connect the pledge back to social norms.

According to Vandenbergh and Steinemann, social norms "are informal obligations that are enforced through social sanctions or rewards" (as cited in Kennedy, 2010, p. 1145). In other words, people assess their behavior based upon the perceived custom and will change the behavior to comply with that custom (Schultz, 2002). Therefore, I cited the community in the pledge itself and by informing potential pledgers of the number of Thriftway shoppers who had already signed. For example, when presenting the pledge, I said something like, "this pledge has already been signed by over 200 of your fellow Thriftway shoppers. Would you also like to sign the reusable bag pledge?" Pledge signing was completely voluntary; there was no financial or promotional incentive to sign.

Finally, shopper forgetfulness was the barrier targeted, the last effort was a prompt (Carrigan et al., 2010) reminding customers to bring their reusable shopping bags. The prompt was a sticker that asked the question "did you remember your reusable shopping bags" (Appendix 2-C). It was designed to be taken home by the shopper and displayed in a location that would be seen when preparing to go to the grocery store, for example in the car or on a door. Again, as with the wheel and the pledge, the message of the sticker was personalized to the Tacoma community and social norms referencing that not using a plastic bag would protect Puget Sound, the local waterway.

STAGE THREE – CAMPAIGN IMPLEMENTATION AND EVALUATION

The final stage of the campaign was implementation and evaluation. Campaign implementation distributed the campaign materials developed in stage two in order to engage the Thriftway customers and promote reusable shopping bag use. Also at the time of the case study, Stadium Thriftway independently changed store policy in order to encourage use of their new reusable shopping bags. As the store's in-store activities also targeted shopping bag behavior, it will be discussed along with the CBSM campaign. Finally, in order to evaluate the success rate of the behavior change campaign, an assessment survey was administered after the campaign finished.

Methods

CBSM Campaign

The outdoor community-based social marketing campaign took place for four weeks from January 21, 2013 to February 15, 2013. As per the results of the preliminary survey in stage one, it was determined that the best time of day to run the campaign was during the evening. Therefore, the campaign booth was in operation Monday to Friday, 5 pm to 8 pm. The campaign had to be canceled one day (January 24th) and closed early on three other days due to rain. For the campaign, a booth was set up in front of the store's entrance with the wheel of education given prominent display and a bowl of candy as additional enticement. Shoppers were approached when entering the store with an appeal to spin the wheel and answer a question. After approaching the booth, shoppers were given a change to sign the pledge, asked about their reusable shopping bag habits, and given the reminder sticker to take home.

In order to assess the success of the campaign, a field log was kept of everyone contacted (Appendix 2-D). There were five possible data points to be recorded for each customer contacted: whether or not they participated in the three activities available (spinning the wheel, signing the pledge, and taking a sticker), whether or not the individual owned reusable shopping bags, and whether or not they brought their reusable bags to the store. Contact was considered made if one or more of these data points were collected. For example, a person was considered contacted if they told me whether or not they owned reusable bags, but did not engage in any of the other activities. Additionally, I tracked if I had already spoken to an individual on a previous campaign night and made additional notes on any extra information garnered during the exchange (e.g. customers who wanted to collect single-use bags for other uses; reasons customers gave for not owning reusable bags).

Stadium Thriftway's In-Store Activities

Stadium Thriftway's activities also began the week of January 21st and many are still ongoing. The store did not develop their activities using CBSM and as such, the activities were not specifically tailored to customer involvement and the removal of identified barriers. However, many their activities did wind up being compatible with CBSM techniques and targeted the barrier identified in stage one of the case study (helping customers remember to bring their reusable shopping bags).

Overall, Thriftway held one promotional event, continued one previously enacted policy, and changed three other store policies to promote their new reusable bags. For the promotional event, the store occasionally gave away free shopping bags with a $25 purchase. While giving away free shopping bags is a good store promotion, it did not follow the CBSM method because

they were not given to individuals who indicated that "lack of bag ownership" was a major barrier to behavior change. Additionally, as the store did not track who received the bags, there is no way to assess if the new bag had any behavior change effect. Therefore, the free bag was not included as part of the case study.

However, the one old policy and three new store policies did align with both CBSM sub-strategies and the barrier identified by my case study. First, even before enacting new store activities, Stadium Thriftway has had a small sign on their front door asking customers if they remembered their reusable shopping bags. While this sign did not change during the case study, because the sign is a reminder prompt to help shoppers remember their bags, it was included as a question on the assessment survey. Also before the case study, the store gave customers $0.05 for every reusable bag used. Thriftway ended that policy and replaced with a weekly raffle to promote sustainable shopping bag behavior. The store gives each customer a raffle ticket for each reusable bag or no bag used at check out. Then once a week, the store raffles off a $50 store gift card. This provides a financial incentive (McKenzie-Mohr, 2011) for using reusable shopping bags, engages the community members, and tries to create an effective message by linking reusable shopping bag use to fun and reward.

Second, Thriftway is now training their sales clerks to ask customers if they brought their bag with them to the store. This could act as a prompt if the reusable bag is in the car or purse and also helps build social diffusion (Kennedy, 2010). By asking the customer for their shopping bags, shoppers become accountable to the store clerk regarding their responsibility to bring their bags. In this way, social diffusion is fostered because social norms are established and amplified (Tabanico and Schultz, 2007). Finally, whereas before the reusable bags for sale were kept under the checkout counter, now the bags for sale are visible on a rack behind the checkout stands. This

can act as a prompt for customers to remember their bags and can help build social norms by making reusable bag use more visible.

Assessment Survey

After campaign implementation, an assessment survey was performed. The main goal of this survey was to determine if there was any significant change in how Thriftway customers used shopping bags after the CBSM campaign. An additional goal was to learn which of the campaign materials or in-store activities customers found most helpful in encouraging the use of reusable bags (for example, determining if the wheel of education or the pledge was more helpful). Therefore, the assessment survey was broken down into four major topics: demographic information, customer shopping bag habits, perceived effects of the social marketing campaign, and perceived effects of Thriftway's in-store activities (see Appendix 3).

Questions 1 through 7 cover demographic information and customer shopping bag habits and were the same as in the preliminary survey. This was done to allow for possible comparison between the two surveys. Questions 8 to 13 asked respondents about the CBSM campaign including questions on each of the three campaign activities (the wheel, the pledge, and the sticker) in order to determine if Thriftway shoppers found any of these activities to be helpful in remembering their reusable shopping bags. Thriftway's activities were addressed in Questions 14 to 18 with the raffle, the store clerks, and the sign getting specific attention as to perceived effectiveness.

The assessment survey was performed in two shifts (lunch and evening). However, because of rain only 51 surveys were collected for the evening shift (distributed over two days), while 93 surveys were collected for the lunch shift (distributed over four days). As with the

preliminary survey, after completion each survey was marked with the shift and day collected, as well as given a unique number for tracking and evaluation.

Results and Analysis

Overall, I spoke to 563 unique store shoppers and at least 14% of the time, I encountered individuals who had already stopped by the campaign booth on previous day. Because I could only mark down the person as "spoken to before" if they clearly acknowledged that to me, the rate could be higher than 14 percent.

Data Point	Yes	No	Was Not Asked
Wheel of Education	88%	8%	4%
Reusable Bag Pledge	75%	15%	10%
Reminder Sticker	75%	8%	17%
Owns Reusable Bags	86%	12%	2%
Brought Bags to Store	17%	79%	4%

Table 1: Percentage of Visitors Who Completed the Campaign Activities

In total, 88% of the shoppers spun the wheel and tried to answer the question,[7] 75% signed the pledge (that is a total of 425 pledges signed), and 75% took a reminder sticker (Table 1). Additionally, 86% of the shoppers said that they owned reusable shopping bags, but only 17% of those individuals had their shopping bags with them when we spoke. For individuals who owned bags, but didn't bring them, 33% specifically mentioned that they didn't need a bag for the day's shopping trip. While I tried to engage every shopper on all the data points, there were times when I was unable to do so. During the first week one, the main reason for this was not being practiced at making the shopping bag pitch; by the second week, the main reason was shoppers who were uninterested or unable to complete everything. At 17%, the reminder sticker

[7] I did not track how many individuals answered the question correctly.

had the highest rate of failure to engage. This was because during week three, I ran low on reminder stickers[8] so was more conservative in offering the stickers to shoppers.

Many of the same questions were asked on both the preliminary survey and the assessment survey in order to allow analysis and evaluation between how customers responded before and after the two campaigns. Because the campaign was performed in the evening, only the evening responses of both surveys will be compared.

Demographics

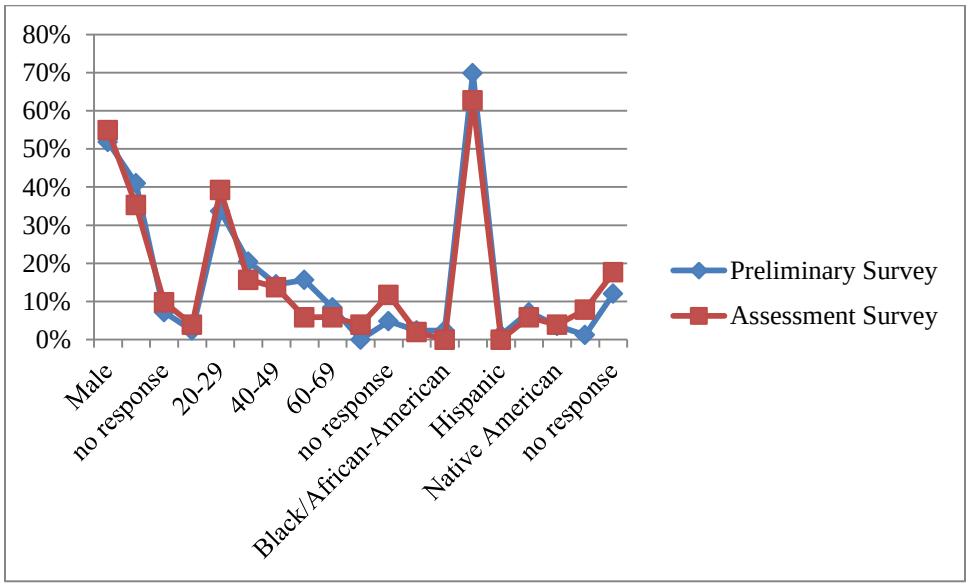

Figure 6: Demographic Results between the Two Surveys

Overall, as represented in Figure 6, the demographics between the two surveys are similar and I was able to get a comparative population responding to the assessment survey as responded to the preliminary survey. Therefore, the two surveys will now be compared as to how the Thriftway shoppers answered questions regarding their shopping bags habits in order to

[8] The new shipment hadn't yet arrived

determine if Thriftway customers' shopping bag behavior changed after the CBSM campaign and the in-store activities.

Changes in Shopping Bag Habits

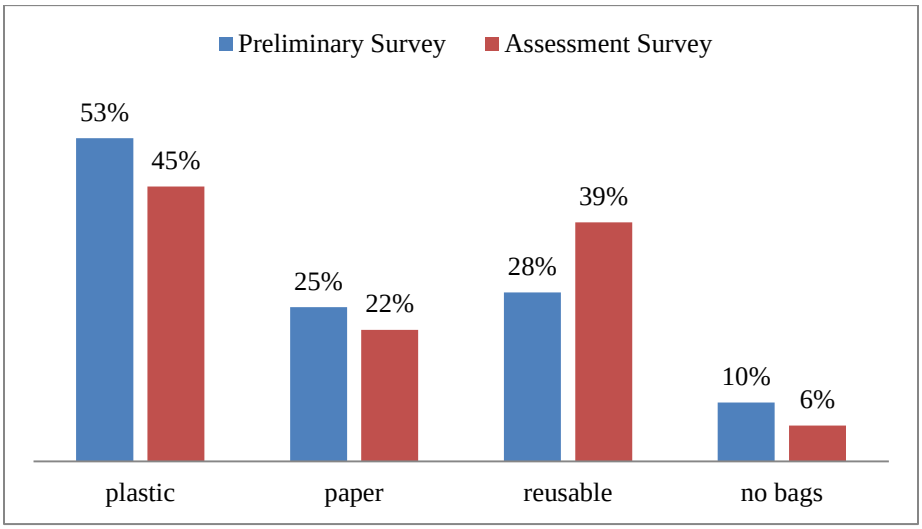

Figure 7: Types of Shopping Bags Typically Used by Survey Respondents

8% fewer evening assessment survey respondents marked plastic bags as one of the shopping bags they normally use (Figure 7). In contrast, assessment survey respondents marked reusable shopping bags 11% more often. As to number of shopping bags owned, there was little change between the two surveys. However, there were differences in how often the survey respondents said they remember to bring their reusable bags (figure 8). 10% more of the assessment survey respondents indicated that they remember their reusable bags much to all of the time, 13% more assessment survey respondents said they use reusable bags half the time, and 23% fewer assessment survey respondents said they either never use reusable bags or only sometimes use their bags. Therefore, the survey results suggest that Thriftway shoppers have increased their reusable shopping bag use (figure 8) and decreased their single-use shopping bag consumption (figure 7).

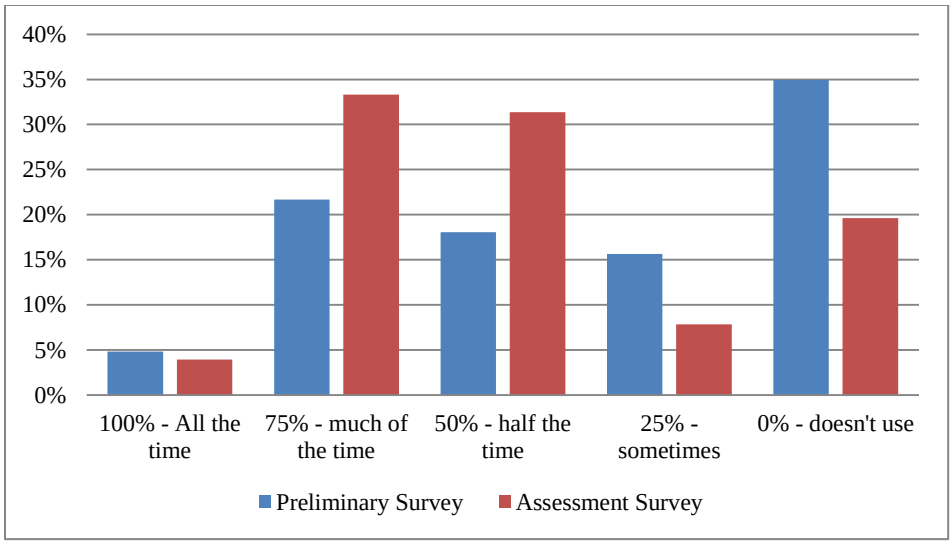

Figure 8: How Often Preliminary and Assessment Survey Respondents Used Reusable Bags

Stadium Thriftway Bag Usage Numbers

The store tracks their shopping bag use by the box. There are 1050 plastic shopping bags per box and 300 paper shopping bags per box (M. Hargreaves, personal communication, May 16, 2013). The table 2 shows the approximate numbers of single-use plastic and paper bags used by Stadium Thriftway for both 2012 and 2013.

	Plastic			Paper		
	2012	2013	Decrease	2012	2013	Decrease
January	43,050	34,650	-20%	14,700	10,800	-27%
February	35,700	32,550	-9%	12,900	11,400	-12%
March	37,800	26,250	-31%	12,600	11,400	-10%
April	44,100	39,900	-10%	16,200	13,500	-17%
May	25,200	40,950	63%	12,900	12,900	0%
June[9]	22,575	13,650	-40%	6,600	5,400	-18%
Totals	**208,425**	**187,950**	**-10%**	**75,900**	**65,400**	**-14%**

Table 2: Stadium Thriftway's Single-Use Shopping Bag Usage Rate (by the bag) (M. Hargreaves, personal communication, June 24, 2013)

By the end of April, Stadium Thriftway reported a 20% decrease in single-use shopping bag consumption since the CBSM campaign and the in-store activities were implemented (M.

[9] These numbers are tentative based on the mid-month data

Hargreaves, personal communication, May 9, 2013). However, there was a 63% increase in plastic bag use and no difference in paper bag use in May 2013 as compared to May 2012. As for the month of June, the preliminary numbers suggest a decrease in bag usage rates for 2013. By mid-June 2013, 40% fewer plastic bags and 18% fewer paper bags were used for the month. Therefore, so far May is the only month to not see some decrease in single-use shopping bag use. More research needs to be performed in order to determine reasons behind May's usage numbers and what those numbers mean for Thriftway's single-use bag consumption.

Overall, the store used 10% fewer plastic bags and 14% fewer paper bags in 2013 than were used in 2012. This supports the results of the assessment survey. As such, all the evidence suggests that Stadium Thriftway customers did change their shopping bag habits. However, these results do not explain the reasons for that change. Therefore, a campaign impact analysis was performed to determine possible reasons for the behavior change.

Campaign Impact Analysis

The campaign impact analysis is an evaluation of how assessment survey respondents perceived the usefulness of the different components. Additionally, as respondents from both shifts (lunch and evening) indicated participation in either the CBSM campaign or the in-store activities, the analysis will be based off the total number of survey respondents. First the CBSM campaign will be discussed, followed by Stadium Thriftway's in-store activities, and finally, the success rates between the two will be compared.

CBSM Campaign

A total of 36 assessment survey respondents marked that they were both aware of the CBSM campaign (assessment survey question 8) and that they stopped by the booth (question 9). In comparison, 90 respondents said that they did not stop by the booth. Finally, 18 respondents were removed for giving contradictory answers to the questions. The following results are for the 36 people who said they visited the booth (campaign visitors).

For campaign visitors, 69% indicated that they engaged in more than one of the booth activities and 80% of the visitors who engaged in more than one activity said they participated in all three activities. Overall, 69% of campaign visitors said they signed the pledge, while 75% said they spun the wheel, and 75% said they received a reminder sticker (Table 3). Only 3 visitors said they visited the booth, but could not remember what activities they performed. It is possible that these visitors simply spoke to me without doing any of the activities.

	Total	**Percentages**
Engaged in More than One Activity	25	69%
Wheel of Education	27	75%
Reusable Bag Pledge	25	69%
Reminder Sticker	27	75%
Can't Remember What Activities They Performed	3	8%

Table 3: Which Activities Campaign Visitors Participated In

Based on these numbers, I analyzed how many participants indicated that the activity helped them remember to bring their reusable bags to the grocery store (Table 4). 72% of the 25 participants who signed the reusable bag pledge said it helped them remember to bring their bag to the store, while 56% of the wheel of education participants and 48% of the reminder sticker participants indicated it helped.

	Wheel of Education	Reusable Bag Pledge	Reminder Sticker
Number of Participants	27	25	27
Yes, the activity helped	56%	72%	48%
No, the activity didn't help	44%	28%	52%

Table 4: Percentage of Activity Participants Who Believe the Activity Helped Them Remember Their Bags

At 72% the reusable bag pledge had the highest rate of participants who believed the activity helped them remember their bags (Table 4). This confirms the CBSM argument that individuals want to remain consistent between thought and action. In signing the reusable bag pledge, campaign visitors became responsible for following through on their commitment. Therefore, having a commitment (either verbal or written) is an important factor when encouraging reusable shopping bag use.

The wheel of education has the second highest rate of perceived effectiveness – 56 percent. One possible reason for this is that according to *The Washington Post* (Maloney and Stanton, 2007), 7 out of 10 Americans do not realize that plastic is made primarily from oil and 4 out of 10 Americans believe that plastic will biodegrade in the landfills or in the ocean; and this does not speak to the knowledge (or lack of knowledge) regarding the environmental dangers of paper bags. For example, one person specifically told me that he began to use his reusable bags more often because he learned that 14 million trees are cut down every year to make paper bags. This means that while education alone does not lead to behavior change, more education specifically on the environmental costs of shopping bags may be helpful in making reusable bag use a priority to American consumers.

Finally, the sticker had the lowest rate of perceived effectiveness. In fact, it is the only CBSM campaign activity where "no, it didn't help" (52%) received more responses than "yes, it helped" (48%). This may be because the individuals who received the sticker forgot to place it in location that would be visible when preparing to go grocery store shopping. A handful of customers informed me they forgot to use the sticker and I witnessed at least four other respondents place the sticker on skateboards, bicycles, or on a shirt. Therefore, just receiving the sticker isn't enough to ensure its use as a prompt. Future campaigns will need to develop a follow-up procedure in order to make sure shoppers place the stickers in an effective location.

Stadium Thriftway's In-Store Activities

A total of 91 respondents noticed one or more of the efforts occurring inside Stadium Thriftway, 41 individuals marked that they didn't notice any of the efforts, and 12 respondents were removed for failure to answer questions 14 to17 or for giving contradictory answers. The following results are for the 91 shoppers who said they noticed at least one of Thriftway's activities (aware respondents).

Question 14 asked respondents which of the Stadium Thriftway in-store activities they noticed (marking all that apply). Therefore, the results below do not equal 100 percent. Additionally, while "reusable bags are now visible in the store" and "given free bag" were not further evaluated in the study, for study completion I did include those options as possible answers to Question 14.

	Total	Percentage
Noticed More Than One Activity	42	46%
The Raffle	61	67%
Asked By Store Clerks if They Remember their Bags	32	35%
Reminder Sign on the Front Door	14	15%
Reusable Bags Now Visible in the Store	28	30%
Given Free Bag	7	8%

Table 5: Which In-Store Activities the Shoppers Were Aware of

The raffle was by far the in-store activity that the largest number of people noticed; 67% of the 91 aware respondents said they noticed the raffle. In comparison, only 35% of aware respondents said they noticed being asked by the store clerks if they remembered their reusable bags. One reason the store clerk number might be so low is because store clerks do not consistently remember to ask shoppers if they remembered their reusable shopping bags. I have never personally been asked and 16% of aware respondents indicated they have never been asked. Finally, only 15% of aware respondents said they have noticed the store sign on the front door.

Additionally, three questions (questions 15-17) were asked pertaining to the raffle, the store clerks, and the door sign. These campaign activities were chosen for further research because they lined up with the social marketing techniques and targeted the barrier identified in the stage one of the case study. Each question asked the respondent if the effort helped them remember their reusable bags. Also, the results for each question were based on the number of people who indicated in question 14 that they noticed the activity (Table 6).

	The Raffle	Store Clerks	Store Sign
Number of Participants	61	32	14
Yes, the activity helped	48%	66%	50%
No, the activity didn't help	52%	24%	50%

Table 6: Percentage of Shoppers Who Noticed the Activity and Believe It Helped Them Remember Their Bags

While the highest number of aware respondents said they noticed the raffle, only 48% of those 61 respondents said it helped them remember their bags. This might be because noticing the raffle does not mean participating in the raffle, by the time the shopper gets the raffle ticket, they are in the line to check out and it is too late to have an effect, or possibly, because the assessment survey was performed only one month after the raffle began, the raffle was too new to have had made much of an impact. Several shoppers did informed me that the raffle is fun and they enjoy participating in it, which may increase the likelihood that they begin to bring their bags more in order to continue participation in the raffle. Therefore, further research should be done to determine why the raffle did not garner a higher perceived effectiveness rate and if the rate increases over time.

In comparison, while only 32 aware respondents noticed the store clerk activity, 66% of those respondents said that being asked by a store clerk if they remembered their reusable bags did help them remember to bring their bags to the store. Also, anecdotally, during the campaign and the assessment survey, at least five different Thriftway customers informed me that they began using their reusable bags more often because they knew they would see me on the corner every night. While this isn't store clerk interaction, it does further confirm that accountability to another person can increase the sense of responsibility and encourage reusable shopping bag use.

Finally, only half of the respondents who noticed the sign said that it helped them remember to bring their reusable bags. This might be for two reasons. First, anecdotally, one person during the campaign informed me that having a store sign doesn't help because she became inured to it and eventually stopped noticing it when entering the store. Therefore, while the sign encouraged short-term behavior change, in the long-term she reverted back to her old habits. Second, the preliminary survey found that of the respondents who forgot their bags, 76% said they forgot their bags at home. Therefore, while having a store sign might help shoppers who forget their bags in the car, it will have a limited effect on shoppers who forget their bags at the house.

Comparative Analysis between Shoppers Who Did and Didn't Know about the Campaigns

For the last part of the analysis, I broke the assessment survey respondents into four groups: (1) **campaign visitors** (respondents who visited the campaign booth), (2) **non-visitors** (respondents who didn't visit the booth); (3) **aware respondents** (respondents who were aware of the Thriftway activities); and **non-aware respondents** (respondents who were not aware of the in-store activities). This was done in order to assess if there were significant differences between how these different groups used shopping bags.

Campaign visitors and aware respondents were the most likely to say that Thriftway is the main grocery store at which they shop (Table 7). 33% more campaign visitors gave that answer than did non-visitors and 24% more aware respondents gave that answer than non-aware respondents. Additionally, campaign visitors and aware respondents were more likely to say they visit the store at least once a week. 72% of campaign visitors and 73% of aware respondents visit the store at least once a week compared to 53% of non-visitors and 39% of non-aware

respondents. This shows that the target community (regular Thriftway customers) was the community most affected by both the CBSM campaign and the in-store activities.

	Campaign Visitors	Non-Visitors	Aware Respondents	Non-aware Respondents
# of Participants	36	90	91	41
Thriftway is primary Grocery store	61%	28%	44%	20%
Isn't primary store	39%	72%	56%	80%
Visits less than once a week	17%	40%	21%	54%
Visits 1-2 times a week	50%	32%	44%	32%
Visits 3-4 times a week	11%	17%	21%	5%
Visits 5 times or more	11%	4%	8%	2%

Table 7: Demographic Information of the Four Different Groups

Second, the groups were analyzed by what type of shopping bag they said they typically use (Table 8). These numbers are not based on 100% as several respondents selected more than one option. Aware respondents and campaign visitors were more likely to use reusable bags than non-aware respondents or non-visitors. 33% more aware respondents said they typically use reusable bags than non-aware respondents and 6% more campaign visitors said they typically use reusable bags than did non-visitors. Additionally, fewer aware respondents and campaign visitors said they use plastic bags. 18% fewer aware respondents said they regularly use plastic bags than did non-aware respondents and 13% fewer campaign visitors said plastic bags than did non-visitors. The results for paper bags and no bags were less conclusive. While 9% fewer aware respondents said they use paper bags than did non-aware respondents, 9% more campaign visitors said they use paper bags than did non-visitors. Finally, non-visitors and non-aware respondents were slightly more likely to use no bags. Therefore, further research will need to be performed in order to confirm and explain those numbers.

	Campaign Visitors	Non-Visitors	Aware Respondents	Non-Aware Respondents
Plastic Bags	33%	46%	33%	51%
Paper Bags	31%	22%	25%	34%
Reusable Bags	42%	36%	48%	15%
No Bags	8%	14%	12%	17%

Table 8: Shopping Bag Typically Used by Respondents of the Four Groups

Finally, 23% more aware respondents said they use their reusable bags much to all of the time than non-aware respondents and 8% more campaign visitors said the same than did non-visitors (Table 9). In addition, 27% fewer aware respondents said they never or only sometimes use their reusable bags than did non-aware respondents and 7% fewer campaign visitors said the same than did non-visitors.

	Campaign Visitors	Non-Visitors	Aware Respondents	Non-Aware Respondents
All the time	14%	11%	14%	7%
Much of the time	28%	22%	31%	15%
Half the time	25%	26%	24%	15%
Sometimes	14%	14%	14%	20%
Never	17%	23%	14%	37%

Table 9: How Often Respondents from the Four Groups Use Their Reusable Bags

Overall, there were significant differences between how the four different groups answered the questions regarding store behavior and shopping bag habits. Non-aware respondents were much less likely to regularly visit Thriftway and less likely to regularly use reusable shopping bags. While there was less of a distinction between campaign visitors and non-visitors, campaign visitors were still slightly more likely to use reusable shopping bags instead of paper or plastic. However, 30 campaign visitors (83% of campaign visitors) were also aware of the in-store activities; this means further research needs to be performed in order to determine if the CBSM campaign was the reason that campaign visitors change their shopping bag behavior.

Conclusion

While the long-term success of the campaign is not yet known, based on the surveys and bag usage results, Thriftway shoppers have decreased their single-use shopping bag consumption and increased their reusable shopping bag use. Therefore, shopping bag behavior has been changed and sustainable behavior has been successfully promoted. More research will need to be done to determine if the behavior changes observed remain the same, increase, or decrease over time.

There was also a perceptible difference between respondents aware of the campaigns and respondents not aware of the campaigns. The biggest difference was between respondents aware of Thriftway's in-store activities and respondents who were not aware of the in-store activities. While the difference between the campaign visitors and the non-visitors was not as definitive, campaign visitors were still slightly more likely to regularly use reusable shopping bags than non-visitors. However, because 83% of campaign visitors were also aware of the in-store activities, this research cannot gauge how much the CBSM campaign was directly responsible for the differences in the behavior observed.

The evidence suggests that CBSM was useful in identifying and targeting barriers to shopping bag behavior change. While Thriftway's in-store activities were not consciously designed around CBSM or the barrier identified by the preliminary survey, many of its policies and activities did aid customers in remembering their reusable shopping bags. The raffle, the store sign, and new store clerk training all discouraged forgetfulness and encouraged customers to remember to bring their reusable bags to the store. More research needs to be performed to determine if the in-store activities would have the same effect if the barrier to change was different (i.e. shoppers collecting single-use bags for other purposes).

Finally, the results of the assessment survey suggest that social norm was the CBSM tool that respondents perceived to be the most effective. Both the pledge and interaction with the store clerks had the highest rates of success, which suggests that promoting a commitment, a sense of accountability, and building social norms are important tools in changing shopping bag behavior. The prompts (the reminder sticker and the store sign) were perceived to be the least effective. More research will need to be performed in order to determine why the prompts were not as effective and if either the sticker or the sign can be used more successfully.

CONCLUSION

American society is built on the economic-consumption paradigm, which values economic expansion and resource consumption. However, this paradigm is leading to social disenfranchisement and an expanding list of environmental problems. Therefore, strong sustainability represents an attempt at a significant paradigm shift, one that understands that in order to ensure human survival and prosperity, environmental conservation and protection need to be emphasized. A major tenant of the strong sustainability paradigm involves the reduction of unnecessary consumption and waste, which necessarily requires fostering sustainable behavior amongst private citizens in order to replace single-use disposable items with durable reusables. For example, sustainability means encouraging shoppers to replace single-use shopping bags with reusable shopping bags.

The environmental science of shopping bags shows that reusable bags, when re-used, are the most sustainable option. Because reusable bags are long-lasting and durable, there is less consumption and waste and therefore, reusable bags have the least environmental impact. However, the history of bag legislation shows that the cities and countries with the most successful legislation and most sustainable shopping bag habits have engaged with their communities to build support and promote voluntary change. Community-based social marketing (CBSM) is a method that has been proven to address barriers to change and promote behavior change by engaging with the community at every step.

Finally, in order to assess whether or not CBSM can promote sustainable shopping bag behaviors (i.e. encouraging the use of reusable bags), a case study was performed at Stadium Thriftway, a local grocery store in Tacoma, Washington. Following the steps of CBSM, a three-

stage campaign was designed, implemented and evaluated. Ultimately, the evidence suggests that CBSM was successful in decreasing single-use shopping bag consumption and increasing reusable shopping bag use. Therefore, CBSM can help foster sustainable behavior when trying to build the new strong sustainability paradigm.

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APPENDIXES

UNIVERSITY of WASHINGTON TACOMA

APPENDIX ONE: Preliminary Survey

Age:_____ Gender:_____ Race/Ethnicity:_____

1. **Is Thriftway the main store you visit to buy groceries?**
   - ☐ Yes
   - ☐ No

   If no, where do you normally shop:
   _____
2. **What brings you to Thriftway today?**
   - ☐ Picking up one or two items
   - ☐ Buying groceries for the week
   - ☐ Other:_____
     _____
3. **How many times a week do you shop at Thriftway?**
   - ☐ Under 1 time a week
   - ☐ 1 to 2 times a week
   - ☐ 3 to 4 times a week
   - ☐ 5 or more times a week
4. **Which type of bags do you** typically use **to grocery shop?**
   - ☐ Single-use plastic shopping bags
   - ☐ Single-use paper shopping bags
   - ☐ Reusable shopping bags
   - ☐ I don't normally use shopping bags
5. **What do you do with your *plastic* shopping bags after using them?**
   - ☐ Recycle the bags
   - ☐ Throw them away
   - ☐ Store and reuse them
   - ☐ Throw some away and store some for reuse
   - ☐ I do not use **plastic** shopping bags
6. **What do you do with your *paper* shopping bags after using them?**
   - ☐ Recycle the bags
   - ☐ Throw them away
   - ☐ Store and reuse them
   - ☐ Throw some away and store some for reuse
   - ☐ I do not use **paper** shopping bags
7. **If you have reusable shopping bags, how did you get them? *Please Mark all that apply***
   - ☐ I bought my reusable bags
   - ☐ I was given free reusable bags
   - ☐ I do not have any reusable shopping bags
   - ☐ Other: _____
8. **How many reusable shopping bags do you own?**
   - ☐ 0
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 4
   - ☐ 5 or more
9. **How often do you remember to use your reusable bags when shopping at the grocery store?**
   - ☐ 100% (All the time)
   - ☐ 75% (Much of the time)
   - ☐ 50%: (About half the time)
   - ☐ 25% (Sometimes)
   - ☐ 0% (Never)
   - ☐ I don't use reusable shopping bags
10. **If you do not use reusable shopping bags, why not? *Please mark all that apply***
    - ☐ It is more convenient to use single-use plastic or paper shopping bags
    - ☐ It is too expensive to buy reusable bags
    - ☐ I collect single-use paper or plastic shopping bags to reuse at home
    - ☐ I forget my reusable bags at the home
    - ☐ I forget my reusable bags in my car
    - ☐ I typically use reusable shopping bags
    - ☐ I do not use any shopping bags
    - ☐ Other:_____

UNIVERSITY of WASHINGTON TACOMA

11. Which option below do you think would be useful in helping you use less plastic bags? ***Please mark all that apply***

- ☐ Having a sticker in my car that reminds me to take my bags to the store
- ☐ Having a sign upon store entry that reminds to take my bags into the store
- ☐ Being asked by the store clerk if I have brought my bags
- ☐ Being asked by the clerk if I need a bag for my purchases
- ☐ Being given a free reusable bag to use while shopping
- ☐ Being given a $.05 grocery store discount for each reusable bag I bring to the store
- ☐ Being entered into a raffle for a grocery store gift card for each reusable bag I bring to the store
- ☐ Having a ban or fee on using plastic bags or paper bags
- ☐ Learning more about the environmental costs of plastic bags
- ☐ None of the above
- ☐ Other: _____

12. Would you feel that your right to personal choice as a consumer would be violated if single-use plastic shopping bags were banned from shopping centers?

- ☐ Yes
- ☐ No
- ☐ Not Sure/No opinion

13. Have you heard of the recently implemented Seattle law to ban single-use shopping plastic bags?

- ☐ Yes I have heard of the ban and am well informed on it
- ☐ Yes I have heard of the ban, but know little to nothing about it
- ☐ No, I have not heard of the ban

14. Which of the options below would you be most likely to support in Tacoma?

- ☐ A ban on single-use plastic shopping bags
- ☐ A ban on single-use plastic shopping bags and a fee on single-use paper shopping bags
- ☐ A fee on single-use plastic shopping bags
- ☐ A fee on single-use plastic shopping bags and a fee on single-use paper shopping bags
- ☐ I would not support any of the above options

15. How important are environmental issues to you?

- ☐ ***1 – Not at all important***
- ☐ ***2***
- ☐ ***3***
- ☐ ***4***
- ☐ ***5 – Extremely important***

16. Which type of bags do you believe is the most environmentally friendly option?

- ☐ Single-use **plastic** shopping bags
- ☐ Single-use **paper** shopping bags
- ☐ Reusable shopping bags

17. Why do you believe that to be the most environmentally friendly option?

_____

_____

_____

APPENDIX TWO: Campaign Materials

A. Wheel of Education Questions

The questions below are in the order placed on the wheel, beginning with the top right question and moving clockwise around the wheel.

1. Americans use 100 billion plastic bags every year. How many times would that number circle the Earth's equator?
    a. 176 times
    b. 576 times
    c. 776 times
2. How much better are reusable for the environment over paper bags?
    a. 39 times better than paper
    b. 29 times better than paper
    c. 19 times better than paper
3. The life of a reusable tote bag averages 10 years. In this amount of time, if you grocery shop once a week, how many plastic bags can be replaced by 1 reusable tote bag?
    a. 2,880 plastic bags
    b. 1,880 plastic bags
    c. 880 plastic bags
4. Plastic bags photodegrade. What does photodegrade mean?
    a. Plastic bags degrade back into oil or natural gas
    b. Plastic bags degrade into smaller and smaller pieces of plastic
    c. Plastic bags degrade when they get their photo taken
5. 12 million barrels of oil are used each year to make plastic bags. How many times would you have to drive across the United States to use those barrels in gasoline?
    a. 300 times
    b. 3 thousand times
    c. 3 million times
6. How many times can paper be recycled?
    a. 4-6 times
    b. 10-15 times
    c. 25 times or more
7. A beached grey whale was found in Western Seattle. How many plastic bags were in its stomach?
    a. 20 bags
    b. 10 bags
    c. 5 bags
8. How many trees are cut down every year in order to produce paper bags?
    a. 14 thousand trees
    b. 14 million trees
    c. 14 billion trees

B. Reusable Shopping Bag Pledge

The pledge below is the actual size of the pledge given to Thriftway customers to sign.

Plastic bags are responsible for killing over 200 different species of marine animals and 14 million trees are cut down every year to product paper bags. Therefore, I, _____, pledge to join my fellow Stadium Thriftway customers in protecting the planet by using reusable shopping bags when I need a bag for my purchases.

_____ _____

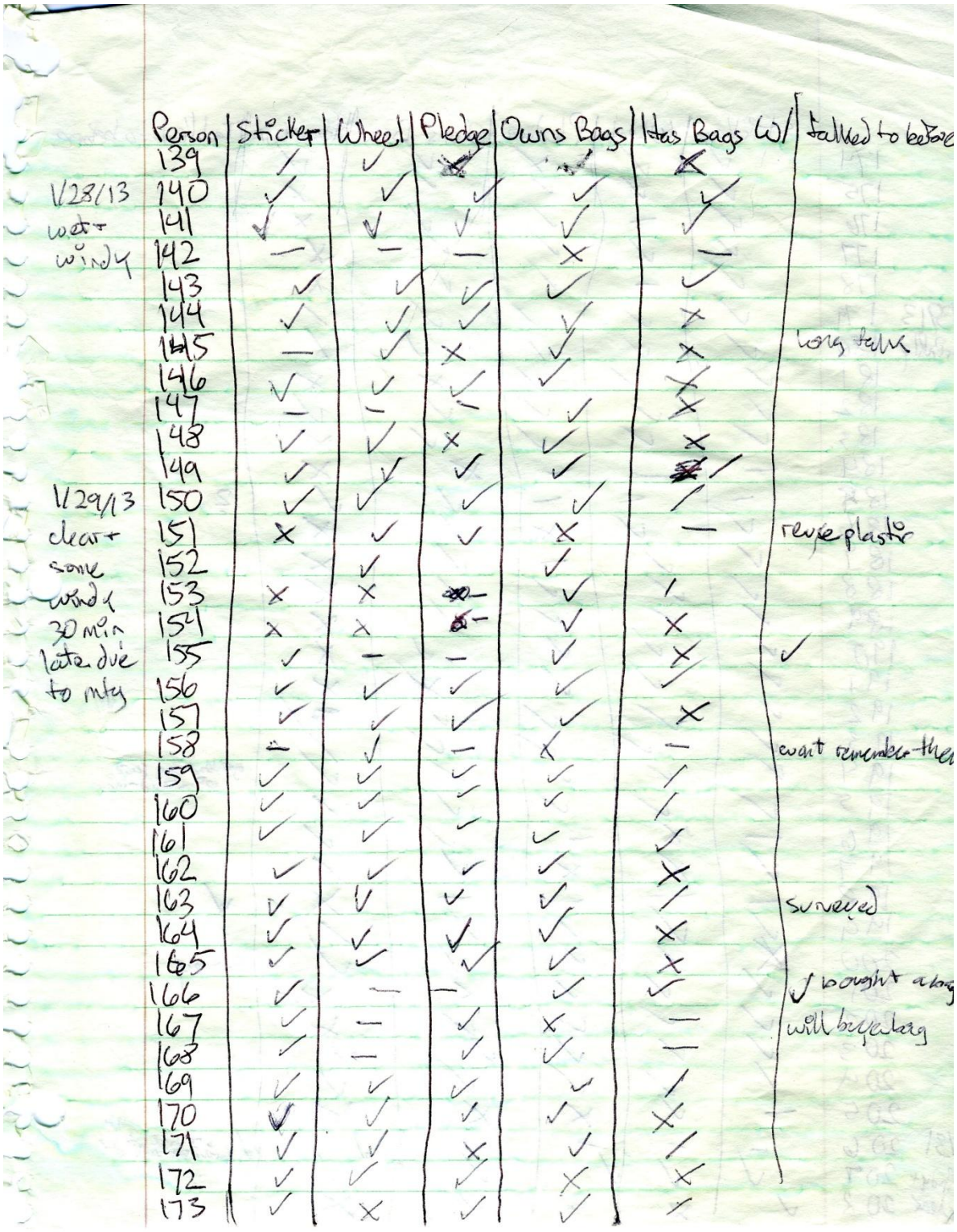
Signature Date

C. Reminder Sticker

The sticker below is the actual size of the sticker handed out to Thriftway customers.

D. Example of the Field Log

√ performed activity
X didn't perform activity
– wasn't asked to perform the activity
/ didn't bring bags because don't need them



UNIVERSITY of WASHINGTON TACOMA

APPENDIX THREE: Assessment Survey

Age:_____ Gender:_____ Race/Ethnicity:_____

1. **Is Thriftway the main store you visit to buy groceries?**
   - ☐ Yes
   - ☐ No

   If no, where do you normally shop: _____
2. **What brings you to Thriftway today?**
   - ☐ Picking up one or two items
   - ☐ Buying groceries for the week
   - ☐ Other:_____
3. **How many times a week do you shop at Thriftway?**
   - ☐ Under 1 time a week
   - ☐ 1 to 2 times a week
   - ☐ 3 to 4 times a week
   - ☐ 5 or more times a week
4. **Which type of bags do you** typically use **to grocery shop?**
   - ☐ Single-use plastic shopping bags
   - ☐ Single-use paper shopping bags
   - ☐ Reusable shopping bags
   - ☐ I don't normally use shopping bags
5. **If you have reusable shopping bags, how did you get them?** ***Please Mark all that apply***
   - ☐ I bought my reusable bags
   - ☐ I was given free reusable bags
   - ☐ I don't have any reusable shopping bags
   - ☐ Other: _____
6. **How many reusable shopping bags do you own?**
   - ☐ 0
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 4
   - ☐ 5 or more
7. **How often do you remember to use your reusable bags when shopping at the grocery store?**
   - ☐ 100% (All the time)
   - ☐ 75% (Much of the time)
   - ☐ 50%: (About half the time)
   - ☐ 25% (Sometimes)
   - ☐ 0% (Never)
   - ☐ I don't own reusable shopping bags
8. **Were you aware of the month long campaign on the corner of Thriftway's entrance to encourage reusable shopping bag use?**
   - ☐ Yes, I was aware of the campaign and spoke to the attendant to learn more about it
   - ☐ Yes, I was aware of the campaign, but did not stop by or speak to the attendant
   - ☐ No, I was not aware of the campaign
9. **If you stopped by the campaign booth, which of the following did you do?** ***Please mark all that apply***
   - ☐ I signed the pledge
   - ☐ I was given a sticker to place in my home or car that reminds me to get my reusable shopping bags
   - ☐ I spun the wheel and tried to answer a question about shopping bags
   - ☐ I spoke briefly with the booth attendant
   - ☐ I stopped by the booth, but do not remember what I did
   - ☐ I did not stop by the booth
10. **Did signing the pledge help you remember to grab your reusable shopping bags when going to the store?**
    - ☐ Yes, I signed the pledge and it helps me remember my bags
    - ☐ No, signing the pledge had no effect on how I use shopping bags
    - ☐ I did not sign the pledge
    - ☐ I do not remember whether or not I signed the pledge

UNIVERSITY of WASHINGTON TACOMA

11. **Did being given a sticker that reminds you to use your bags help you remember your bags when going to the store?**
    - ☐ Yes, having the sticker does help me remember my bags
    - ☐ No, having the sticker hasn't effected how I use shopping bags
    - ☐ I was not given a sticker
    - ☐ I do not remember whether or not I was given a sticker
12. **Did spinning the wheel and answering a question about the environmental consequences of paper and plastic shopping bags encourage you to bring reusable shopping bags to the store?**
    - ☐ Yes, answering a question on the environmental consequences of shopping bags encouraged me to use reusable shopping bags instead of paper or plastic
    - ☐ No, I answered the question, but it had no effect on how I use shopping bags
    - ☐ I did not spin the wheel and answer a question regarding shopping bags
    - ☐ I do not remember whether or not I spun the wheel
13. **Overall, what is your opinion about the campaign performed last month?**

    _____

    _____

14. **Stadium Thriftway has begun promoting the use of reusable shopping bags. Which of the following have you noticed and/or participated in?** ***Please mark all that apply***
    - ☐ The weekly raffle, which I can enter by bringing a reusable shopping bag or not using any shopping bag
    - ☐ The store clerks now ask me if I have brought a reusable bag at checkout
    - ☐ The reusable shopping bags for sale are now visible for sale behind the checkout counter
    - ☐ I was given a free bag with my purchases
    - ☐ The sign by the front door reminding me to bring my reusable shopping bags into the store
    - ☐ I haven't noticed any of the above options
15. **Does the weekly raffle help you remember to bring your shopping bags to the grocery store?**
    - ☐ Yes, being entered into a weekly raffle does help me remember to bring my bags to the store
    - ☐ No, the raffle hasn't effected how I use shopping bags
    - ☐ I did not know that Thriftway was holding a weekly raffle
16. **Does having the store clerks asking if you have brought a reusable bag at checkout help you remember your reusable shopping bags to the grocery store?**
    - ☐ Yes, being asked by the clerk if I brought my bag has helped me remember to bring my bags to the store
    - ☐ No, it has had no effect in how I use shopping bags
    - ☐ I have not been asked by the store clerk if I brought my bags with me to the store
    - ☐ I do not know if the store clerks have asked me if I brought my bags with me to the store
17. **Has having a sign at the store entrance that asks you if you remembered your bags helped you bring your shopping bags to the grocery store?**
    - ☐ Yes, I have noticed the sign and it has helped me remember my bags
    - ☐ No, I have noticed the sign, but it has not effected how I use shopping bags
    - ☐ I have not noticed the sign
18. **Overall, what is your opinion of the changes made at Stadium Thriftway?**

    _____

    _____

APPENDIX FOUR: Stadium Thriftway Shoppers' Opinions on Bag Legislation

The following questions were asked on the preliminary survey in order to assist the Sustainable Tacoma Commission (STC) in determining support for possible shopping bag legislation in Tacoma. Below is a breakdown of respondent answers.

Question 12: Would you feel that your right to personal choice as a consumer would be violated if single-use plastic shopping bags were banned from shopping centers?

	Totals	Percentage
Yes	42	26%
No	91	55%
Unsure	28	17 %

Question 13: Have you heard of the recently implemented Seattle law to ban single-use shopping plastic bags?

	Total	Percentage
Yes, I have heard of the ban and am well informed on it	76	46%
Yes, I have heard of the ban, but know little to nothing about it	44	27%
No, I have not heard the ban	41	25%

Question 14: Which of the options below would you be most likely to support in Tacoma?

These numbers don't equal 100 because 12 of the respondents chose more than one answer.

	Total	Percentage
Ban on single-use plastic bags	54	33%
Ban on single-use plastic and a fee on single-use paper bags	29	18%
A fee on single-use plastic bags	31	19%
A fee on single-use plastic and a fee on single-use paper bags	25	15%
I wouldn't support any of the above options	41	25%