CONSUMER WILLINGNESS TO PAY FOR TRANSITIONAL ORGANIC PRODUCE

by

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THESIS ABSTRACT

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United States agriculture is continuing to shift toward organic production techniques to align with consumer demand, yet organic products make up an insignificant portion of the food market. This disparity has been examined via consumer willingness to pay for organic products and research on the costs and benefits of organic operations; however, little has been investigated about a potential transitional organic market. In shifting from conventional to organic agriculture there is a substantial transition phase of at least three years, during which producers cannot label their products as USDA organic. This research therefore examines consumer willingness to pay for transitional organic produce based on a Lane County representative adult population (n = 200). Results of the conjoint choice stated preference survey suggest that there exists a viable market for transitional organic products, revealing systematic heterogeneity in preferences for produce labeled as transitional USDA organic.

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CHAPTER I

INTRODUCTION

Agriculture and the Environment

In his essay "Man and Nature," George Perkins Marsh (1870) notes that people depend on the natural world for survival, but destroy the environment in the process of obtaining their livelihood. The destruction caused by agricultural intensification supports Marsh's (1870) hypothesis that increased exploitation of nature would occur simultaneously with modernization and improvements in civilization. As humans settled, they seamlessly converted natural lands into farmland – a completely different biome – in order to provide for a less nomadic lifestyle. Farmland is now a prominent feature of the landscape, displacing areas of diverse ecosystem, such as wetlands and grasslands. Humans in this regard have been and continue to be active agents of transformation through the destruction and conversion of landscapes. On the one hand, land has been significantly altered and continues to be altered through dominant agricultural practices; however, there is potential for reduced alteration of the environment based on changes in agricultural choices both at the production and consumption level.

Farming was revolutionary in its implications for humanity, providing the food surpluses that later fueled full-blown civilization…" (Balter, 2007, p.1830). However, farming also brought along with it drastic alterations to the physical environment. The human domesticated landscape – agricultural land – has created a farmland ecosystem to enhance food supply for humans at the expense of previous ecosystems. This type of conversion hints at the intricate process of balancing the tradeoffs of agricultural production with ecosystem services. Domesticated agricultural landscapes represent a

value of increased productivity and convenience in obtaining resources for human populations greater than a value in other services ecosystems provide. For instance, over half of the Earth's freshwater is used by humans largely for agricultural purposes (Vitousek, Mooney, Lubchenco, & Melillo, 1997), and more than fifty percent of the "world's surface area has been converted to grazed land or cultivated crops" (Kareiva, Watts, McDonald, & Boucher, 2007, p. 1866). Agricultural transformations have altered many regions around the world, and specific production methods, reinforced by economic drivers, exacerbate this negative environmental alteration.

The majority of farmers in the United States, to minimize economic costs without giving thought to externalities, maintain the productivity of their land by using conventional industrial production and unsustainable water use (Kelley, Phillips, & Williams, 2012). This cost-minimizing, yield-maximizing mentality is perpetuated by messages from consumers and distributors that only price matters. The most readily available information that travels between producers and consumers is price, therefore when consumers demand cheaper food producers seek to meet that demand by producing food in cheapest way possible to make economic returns. As such, a "cheap food" economy is set in motion with a self-reinforcing feedback loop.

While the use of industrial-conventional techniques maximizes yields and provides an easy fix for controlling pest populations, these production methods often involve large external costs that are not reflected in product price. In this regard conventional agriculture, hiding under its illusion of easy maintenance and productivity, does not address sustainability measures, as it typically results in drastic negative environmental consequences largely associated with heavy applications of synthetically

manufactured chemicals. As an alternative to conventional techniques, organic agriculture arguably pays more attention to environmental repercussions and is better at achieving ideals of sustainability. In a way, the organic food industry throws a wrench in the low consumer price, low producer cost, high-yield feedback by offering more information to be passed along the producer-consumer food system. Organic food and additional labels (if properly maintained) provide a way for consumers to pay based on a preferred narrative – one that tells producers that there is value in specific types of production that align more with sustainability and conservation than with lowest cost.

Many participating organic consumers and non-organic consumers alike agree that there is a need to protect our environment in order to achieve sustainability goals. Sustainability, encompassing environmental, social, and economic sustainability, means that needs of the current generation are met without compromising the ability of future generations to meet their needs, and that within the same generation the activities of one do not hinder the ability of others to engage in similar essential activities.[1] Adding to this definition, sustainability also assumes that future generations are left with the capacity to be as well off as we are today, taking into account the uncertainty in knowing the desires of future generations.[2] In essence, sustainability measures seek to achieve distributional equity among generations, ensuring that environmental protection for current and future use coincides with social development and takes into account economic dimensions.

To achieve sustainability there are a variety of activities that must be managed properly; otherwise, the valuable resources provided to us by Earth may not be available

[1] This definition of sustainability is adapted from the Bruntland Commission's definition of sustainable development proposed in 1987.

[2]The capacity of well being sustainability definition was first introduced by economist Robert Solow.

in the future. Unfortunately, given the wide variety of human needs and conflicting interests, management of natural resources and effective decision-making is difficult. To make matters more complicated, the dynamic nature of our environment makes it challenging to determine what is the “best” way to protect our natural resources while supporting the needs of human and non-human populations. Despite this challenge, recent domestic and global efforts have been aimed at gaining a better understanding of how we can protect our environment through analysis and collaboration across different domains relevant to the issue. One such domain is the interaction of agricultural production systems and protection of the environment. From the agriculture-environment interaction, the assumption here lies that more sustainable farming methods, such as organic farming, can lead to increased environmental protection and movement toward sustainability goals.

There are substantive arguments suggesting that the organic farming industry, as it is known today, has been overtaken by the same industrialization processes that the organic movement initially set out to oppose. However, organic practices have been proven to be better for the environment than conventional agricultural practices. The small family farm agrarian-pastoral reform sought out by the early organics movement may not be evident in the United States Department of Agriculture Organic Program; however, the assumption is that the organic industry/organic agriculture system as an alternative to conventional agriculture produces net benefits for society and the environment. Organic farming, with decreased energy and chemical inputs, can bring about environmental improvements over conventional industrial farming through a variety of means, such as increased soil health and decreased runoff. Organic farming can

also achieve social and economic sustainability. Improved environmental and food justice is addressed through decreased exposure to harsh chemicals by farm workers and increased access to safer and healthier food for all communities given an increased supply of organic options and eventual price decline. Rather than being a "…radical alternative to a hegemonic food system" (Guthman, 2004, p.3), organic farming as it is now practiced can still be an improvement over the status quo. The organic industry can provide opportunity for mainstream American producers and consumers, and with increased organic production, USDA organic can become a new standard to base further sustainable agriculture improvements off of in the future.[3]

The organic industry has benefited from the accelerated product differentiation process that has occurred in recent decades in the United States food market. This product differentiation process is largely due to variations in production techniques that make agricultural products non-homogeneous. In particular, consumer demand for healthy and sustainable foods is causing the food market is becoming increasingly inundated with a variety of product attributes marketed to consumers – non-GMO, natural, whole grain, etc. – based on assertions of agricultural and processing methods. "With the growth of organics and mounting concerns about the wholesomeness of industrial food, storied food is showing up in supermarkets everywhere these days…" (Pollan, 2006, p.135).

[3] The differentiation between the organic industry and the organic movement in the United States is made clear by asserting that the organic industry is not meant to provide a systemic reconstruction of the food system, but rather solicit a more modest goal of a an ecologically minded and healthier food system. The organic movement on the other hand is based on agrarian ideals and the "resuscitation of the small family farm" for "healthier food, better working conditions, and locally scaled distribution" (Guthman, 2004, p.21). This research deals with the organic industry and will use the term organic farming, organics, organic agriculture and the like in association with the industry, not with the more radical movement from which it was born. Despite the organic industry's "hijacking" of the term organic, many critics of the organic system cannot deny that organic production reduces chemical exposures and improves environmental conditions.

Over the past four decades, U.S. agriculture has increasingly shifted toward organic production techniques.[4] To determine the costs and benefits of farmers making a transition to a nationally certified organic system, an extensive amount of research has been conducted on organic foods, focusing on consumer preferences and perceptions of the organic agricultural system compared to the conventional agricultural model. In effect, consumer willingness to pay (WTP) a premium for organic products is well documented. Despite the large body of literature and studies conducted on WTP for organic products, little research has been done on the potential market for transitional organic products.

Farmers are often dissuaded from participating in the organic system because of the long certification process and the prohibited use of synthetic substances for at least three years prior to organic production. During this time, with large costs of transition and a steep learning curve, economic competitiveness with conventional products is weak since no price premium can be extracted from consumers. Therefore, many farmers are pressing state governments and federal agencies to institute a new label for transitional organic products to ease the initial phase of switching from a conventional to an organic system.[5] The "transitional" organic label refers to agricultural products that cannot legally be sold as organic, despite being produced using organic techniques. Transitional organic is further defined by products from farms that are in the process of transitioning to organic production and have been doing as such for at least one year.

[4] Despite this fact, organic production comprises only a small sector compared to conventional agricultural production.

[5] Conventional agriculture refers to mainstream production techniques involving a high-input, chemical-intensive (e.g. high fertilizer, pesticide, and herbicide use) system.

If a market exists for products labeled as transitional organic that have a price premium closer to that of regular organic products, then there is the possibility that more farmers would be willing to make the transition, especially with help from government subsidies. A "transitional" organic label for agricultural goods can help farmers make the switch from a less sustainable model to a more sustainable model of production -- that of conventional to organic agriculture. Increasing the amount of organic production in the U.S. can benefit the environment by reducing agricultural pollution and can allow for greater food security through soil regeneration. Consequently, it is important to better understand the price premium consumers are willing to pay for these transitional organic products. This research will therefore ask:

- What is the consumer WTP for transitional organic produce?
    i. Is WTP for transitional organic produce significant enough to warrant a labeling certification program specifically for transitional organic?
    ii. Is there public support for government subsidies providing help to farmers transitioning to organic production?
    iii. What are some defining characteristics of people who are willing to pay a premium for transitional organic compared to those who are not willing?

This research will examine consumer willingness to pay for transitional organic produce based on a Lane County representative adult population. Since transitional organic is mostly a hypothetical market with limited revealed preference[6] data available, a stated preference method is needed to answer the research questions posed above. By using a stated preference survey design to determine consumer willingness to pay via

[6] Revealed preference data is obtained from real market prices, thus consumers are revealing demand through actual purchases, such as cash on the barrelhead data.

choice scenarios, I will: 1) ascertain whether a viable market for transitional organic products exists, 2) provide more information on the benefits and costs of transitioning to an organic system for farmers, 3) possibly inform public policy outcomes for labeling and subsidizing the transitional process to organic agriculture, and 4) contribute to a better understanding of the characteristics of consumers in the transitional organic market.

CHAPTER II

LITERATURE REVIEW

This section provides an interdisciplinary overview of relevant literature concerning the dynamics of the agricultural system in the United States. The intersection of environmental studies with psychology, sustainable decision-making, and economics is most heavily drawn upon.

Agricultural Production

Agricultural production in the United States has been a dramatically transformative process. Since intensive industrial scale agriculture essentially developed out of post-war efforts to turn destructive chemical processes into a new productive endeavor, many academics categorize the dominant and mainstream conventional agriculture as part of the military-industrial complex. Chemical fertilizers and pesticides are largely by-products of wartime and subsequent government attempts to switch the same chemicals used for bombs and poisonous gases to more peaceful uses. For example, the Haber-Bosch process, which sustained German munitions during World War I, now provides a means of rapid nitrogen fixation in soils. The fertilizer industry thus capitalized on the dual use of a military technology, sustaining the military-industrial complex. Fertilizers simultaneously distanced farm production from natural systems, providing a substitute to the abilities of natural bacteria to perform nitrogen fixation.

Synthetic fertilizer overtook the evolutionarily dynamic relationship between soil bacteria and plant nutrient uptake capability and replaced it with an energy-intensive alternative that relies heavily on fossil fuels. In this way, synthetic fertilizer further

separated the food system from nature, yet also provided benefits in terms of output and convenience. Monocultures became the new norm and farms began to operate on scales never seen before – efficiency in production based on yield became the dominant agricultural value. Despite these grand improvements in agricultural production brought about by chemical fertilizers and pesticides, growing environmental concerns sparked by food scares and animal abnormalities soon shed light on problems associated with the large-scale application of such synthetic chemicals. In response, aware consumers and producers began to research and implement alternative approaches to chemically intense agriculture that addressed both health and environmental concerns, such as organic farming. These methods continue to this day to be a productive system of change.

Conventional Agriculture: Techniques and Externalities

Conventional agricultural production methods typically do not set the protection of the environment as a priority. Conventional techniques often involve large applications of synthetically manufactured chemical fertilizers, pesticides, and insecticides to easily control pest populations and to maximize yields. However, these techniques also result in negative environmental consequences. Conventional chemicals diminish the biodiversity of the land, harm organisms at local and global scales, hinder natural soil regeneration, and pollute downstream areas due to chemical run-off (USDA, 2012a).

Heavy use of chemical inputs cause detrimental effects on the surrounding ecosystem and have negative health implications for humans. For one, atmospheric nitrogen fixed by humans, mostly as a result of agricultural nitrogen fertilizer use, is larger than that fixed by all terrestrial sources (Vitousek et al., 1997). This nitrogen

fixation significantly alters the cycling of this important nutrient. Runoff of nitrogen fertilizers, used predominantly in conventional farming, creates large algal blooms and subsequent hypoxic areas of water (Pollan, 2006). Hypoxia results in massive fish kill zones along coastal waterways, commonly known as dead zones. Synthetic fertilizer also increases greenhouse gas emissions, provides a reagent that turns into acid rain (nitric acid), and has the potential to seep into waterways where nitrate exposure can lead to blue baby syndrome (Vitousek et al., 1997). Fisheries deterioration and eutrophication through excessive fertilizer use cost the U.S. $2.5 billion per year (Pimentel, Hepperly, Hanson, Douds, & Seidel, 2005). Similarly, conventional agricultural methods rely heavily on herbicides for weed control. Consequentially, one of the most commonly used herbicides, atrazine, is now found in the majority of streams and groundwater in the United States (USGS, 2001).[7] The overuse of harsh agricultural chemicals, in general, costs the United States alone an estimated $12 billion dollars per year for environmental and human health effects (Pimentel et al., 2005).

Conventional agriculture also reduces soil and land biodiversity through the use of large-scale corporate farms focused on single-crop production. Large-scale corporate farming is characterized by average farm sizes of over 300 acres, and intense chemical and energy dependence (Parsons, 1986). These conventional farms are usually dominated by monocultures, with limited crop rotation. Soil and land biodiversity is thus reduced. Furthermore, conventional plow-based agriculture increases rates of soil erosion (Montgomery, 2007; Pimentel et al., 2005). It is apparent from these examples that

[7] Studies done by Dr. Tyrone Hayes at University of California, Berkeley show the scope of atrazine contamination and have found that this harsh chemical demasculinizes animals. Other chemicals have been linked to certain forms of cancer and detrimental health.

industrial scale agriculture has come with many drawbacks. Organic agricultural production is an alternative system that works to minimize these negative externalities.

Organic Agriculture in the United States

J.J. Rodale, often referred to as the founder of the modern organic farming movement, provided information about non-chemical farming methods beginning in the 1940s through the magazine publication *Organic Gardening and Farming*.[8] It was not until the 1970s, however, that the organic movement began to gain a strong hold in the United States, based on increased consumer demand and growing environmental awareness. An early definition of "organic," springing out of a counterculture movement, entailed a much more comprehensive change to the food system than what the term is known for in supermarkets today. The original organic movement not only incorporated the ecological idea of interconnectedness to push for an alternative method of production – one without chemicals – it also included ideals to establish an alternative food distribution and consumption system, which have been mostly forgotten in the current organic industry.

The reduced scope and appropriation of the term organic can likely be attributed to a compromising push to increase farmer and public acceptance through the establishment of national certification. An early, decentralized certification program created difficulties for the expanding organic industry, as the absence of system-wide standards and regulations allowed different certifiers to create their own meanings for the

[8] Predating this coining of the term "organic," however, Sir Albert Howard (1873-1947) provided the philosophical basis for the systems-holistic approach embedded in organic agriculture, which was developed over decades of research in India and are detailed in Howard's writings *The Soil and Health* and *An Agricultural Testament* (Pollan, 2006).

organic system. It was not until 2002, under guidelines stated with the passage of the Organic Foods Production Act in 1990, when a national standard was set for the production, handling, and processing of foods labeled as organic (Gold, 2009; Sustainable Agriculture Network, 2007). Farmers who sell over $5,000 annually in agricultural products and wish to become organic producers must be certified by a USDA-accredited certifying agent following the National Organic Standards established in 2002. These guidelines have created a system of certification that allows farmers to label their organic products for consumers, passing on information about a specific production style.

Organic agriculture in the United States is controlled in large part by federal regulations. According to the United States Department of Agriculture [USDA] (2012a), organic farming incorporates the management of production that responds to "site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity" (p. 1). Organic production thus means that: 1) no synthetic substances are applied to the land for at least three years prior to harvest of organic crop, 2) no genetically engineered products are used or produced, and 3) weeds and disease are controlled through physical, mechanical, and biological controls (Organic Trade Association, 20013). Within the standards of organic certification there is a built-in requirement that the agricultural production methods utilized incorporate the fundamental understanding that biodiversity is essential for a healthy environment.

Organic farming in practice involves the maintenance of soil health, conservation of resources, and nature-driven management of weeds and disease. Techniques and

concepts utilized to this end include crop rotation, cover crops, green manures, biological controls, and incorporation of biodiversity (Guthman, 2000). As a result, organic systems are better for the environment by increasing water infiltration and increasing the amount of nutrients stored in the soil, resulting in higher quality soil with greater biological activity (Sustainable Agriculture Network, 2007). Organic farming also uses less energy while producing more biomass when compared to conventional systems; more biological material is produced to be recycled back into the natural system. Organic agriculture benefits the farm ecosystem greatly, and creates a healthier extended environment.

Beyond the direct farm benefits of improved soil quality and biodiversity, organic farming reduces agriculture's impact on the external environment through reduced runoff of harsh chemicals. Organic agriculture largely avoids synthetic inputs and instead incorporates "…practices that restore, maintain, and enhance natural means of crop protection and fertility management" (Guthman, 2004, p.219). As a result, drainage from organic farms has proven to contain fewer chemicals, such as nitrates, chlorides, and atrazine, when compared to conventional farms (Sustainable Agriculture Network, 2007). Not only are organic systems gentler on the environment, they have also proven to be just as productive and competitive with conventional systems, especially when factoring in the resiliency and sustainability of the organic system.

The overwhelming evidence that organic agriculture is better for the environment and for people in general has not gone unnoticed by informed consumers. As a result, a boom in demand for organic food and a seemingly large increase in supply occurred in the past couple of decades. Regulations in the U.S. provide organics with significant power in the marketplace due to certification programs, so the North American organic

food market is the fastest growing worldwide (Cranfield, Henson, & Holliday, 2010). Additionally, organic food overall is becoming a rapidly growing sector of the global food industry (Willer & Yussefi, 2004).

Consumers are increasingly demanding organic food in a wide range of varieties, from pre-packaged meals and salad dressing to the more predictable produce options. As a response to this demand, the agricultural sector has shifted to include more acreage of certified organic cropland and pastureland, that according to the USDA quadrupled between 1993 and 2005 (2012a). Since 1990, organic retail sales have increased from 10% to 20% annually (Dimitri & Greene, 2002; Sustainable Agriculture Network, 2007). These organic sales now result in an over $30 billion dollar industry (Organic Trade Association, 2013). However, despite this boom in demand and corresponding increase in quantity supplied, the organic market accounts for only about four percent of the total food sales in the United States, (dominated by organic fruits and vegetables) (Organic Trade Association, 2013; USDA, 2012b). Additionally, organic cropland acreage only comprises 0.7 percent of the total U.S. agricultural acreage, (Sustainable Agriculture Network, 2007; USDA, 2012a). It may seem insignificant, but organic farming has the power to promote a gradual change to a more sustainable agricultural model in the United States, particularly if additional support is provided to farmers who seek to make the transition to organic production.

A Rationale for Nationalized Certification Systems

With the growing interest in organic agriculture, there is a simultaneous interest in determining consumer demand for organic products and the price premium consumers

are willing to pay. Because organic foods are believed to "increase farm income, reduce pollution from agricultural inputs, and provide a healthier alternative to traditional foods" (Hearne & Volcan, 2005, p. 382), many consumers are willing to pay extra for organically labeled food items. Certified labels provide information to consumers that the producers followed designated guidelines and policies in production to ensure that these expected agricultural changes have been appropriately implemented. Certification therefore provides a way in which farmers can market their products as organic and receive an appropriate price premium that reflects the added costs and value that goes into organic production. Without such standards and accreditation, consumers are tasked with determining the credibility of "organic" claims without any baseline for analysis. Certification and labeling of organic and transitional organic options is therefore essential.

Ecolabelling: Benefits and Issues

Research on organic labeling falls into the broader context of ecolabels. Ecolabels provide a means to disseminate information from producers to consumers; they reduce the information gap. Ecolabels also work to differentiate between products that are supposedly green goods and those that are dirty. Unfortunately, in the food market today there is a wide diversity of labels for eco-products that often do not have actual standards backing them up. As a result, consumers might be misled, especially if the entire product cycle is not taken into account (Schumacher, 2010). To deal with this issue, a standardized norm or benchmark can be instituted for ecolabels to ease comparison between different systems and to enable consumers to make more informed decisions.

Standardized ecolabelling should be visible to consumers and enforced across sectors, as is the case with a USDA organic label. USDA organic labels address not only produce, but also meats and other products, as well as the processing and handling of such products. Consumer trust in the information labels is essential and thus sought after in this approach of including standards at multiple steps in the production cycle.

Despite this, consumers are often not aware of the real sustainability or ethical character of a given product due to poor labeling communication (Verbeke, Vanhonacker, DeHenauw, Van Camp, & Sioen, 2007; Shepherd, Magnusson, Sjoden, 2005). Studies have shown that despite a wide knowledge base and awareness of organic products, consumers are not very consistent in interpreting what exactly "organic" is meant by (Yiridoe, Bonti-Ankomah, & Martin, 2005). Consumers tend to only understand the broader issues associated with organic foods, but do not necessarily realize the complexities of the organic system, the farming practices involved, or the food quality attributes that are defining characteristics of organic agriculture (Yiridoe et al., 2005). This lack of knowledge and information about organic standards and certification leads consumers to be skeptical of organic labels and true attributes of the organic foods available for purchase. The potential mistrust in the certification program, however, can be mediated by having organic certification based on properly enforced national standards of USDA organics. Furthermore, considering the growing disconnect between people and their food in American society, providing consumers with more information

about their food choices can be beneficial in reconnecting people to the agricultural activity that produces their food.[9]

Another downside of standardized ecolabels is the exclusion of some farms that are actually following the standards for certification. Many farms may fulfill the requirements for an ecolabel, but fail to actually possess the label for a variety of reasons. For instance, some farmers may not want to participate in the USDA organic system, while others may not have the financial resources needed to obtain certification. As a consequence of this failed label, consumers are unaware of the more environmentally sound practices whereby these products are derived and may consider the products to be conventional goods, when in reality they are a "green" good. Offering support to these smaller farms that wish to participate in the organics systems through certification can thus reduce the gap in production and consumer information.

Subsidies for Organic Agriculture: Potential and Limitations

Despite the benefits of organic agricultural systems and increased demand for products produced under such methods, organic farmers lack support from the United States government. In the U.S., development of the organic system stems from state and industry promotions and as a response to market-driven interactions. Although there are some farm support programs to which prospective organic farmers can apply, there are no explicit federal-level programs that directly aid in the conversion from conventional to organic farming. The majority of national policy geared toward the organic system is thus aimed at the development of standards for the production process and facilitation of the

[9] Food labels may not be as radical of a shift as connecting people back to the farms where their food is produced, but the assertion is that providing more information allows consumers to make more informed decisions about their food choices that align better with their preferences.

certification process (Lohr & Salomonsson, 2000). States have the authority to set priority areas for cost sharing under the Environmental Quality Incentives Program (EQIP), where payments are provided based on different conversion plans. In consequence, farmers must be directed to state entities to receive support, if any. This support is determined by each individual state. This may account for the differences seen in organic production between states, as some states value the organic system more than others and offer more support (Bloom & Duram, 2007).

In contrast to the system in the United States, many European countries have established organic conversion and production support, mostly in the form of direct subsidies for a fixed period of time during conversion. The subsidies require that complete conversion of at least a portion of the farm is undertaken and that organic production is continued following the termination of payment assistance (Lohr & Salomonsson, 2000). As a result of these subsidies, the organic farming sector in Europe has increased by 300% (Lohr & Salomonsson, 2000). This form of government support can be useful in the United States to enable farms to make the conversion more readily by sharing the transition expenses, supporting research, and assisting in market development (Bloom & Duram, 2007; Greene & Kremen, 2003).

Although organic conversion subsidies and support used in Europe are less likely to be accepted in the United States due to the divided political atmosphere over environmental measures, it is important to understand what others are doing and what may work in a similar market-driven society to shift agricultural production toward more sustainable systems. Barriers to organic conversion, including limited availability and access to information regarding production and potential markets, issues with time

management, and high costs of conversion-related investments, can potentially be reduced with implementation of subsidies (Lotter, 2003; Rigby & Caceres, 2001). These subsidies and policy changes will hopefully be more powerful when combined with market-based approaches that can drive the conversion process. Part of the market development support could come in the form of quality checks on certification programs to ensure that certifying bodies and farms are appropriately meeting standards. An additional step that would assist farmers in the transition to organic farming would be instituting a transitional organic label. This market-driven approach would reduce the burden on farmers who are in the process of making the transition away from conventional methods by allowing them to label their goods as "transitional organic" and share in some of the price premium that established organic products enjoy. The new transitional label could, over time, reduce the amount of direct government subsidy support needed, as consumers would share in the farmer assistance costs through market purchasing power.

Researchers reiterate the potentially misguided efforts to institute subsidies without other support services. Theocharopoulos, Melfou, and Papanagiotou (2012) conclude that subsidies may not be the most effective way of increasing adoption of organic farming. Despite the incentive of monetary assistance, farmers often back out of organics due to limited marketing support and information (Rigby & Caceres, 2001). They are also often concerned with inspections by organic certifiers and the quality of technical advice (Bloom & Duram, 2007; Greene & Kremen, 2003). Because the lack of knowledge and scientific support is a major preventative factor in the decision making process, providing a public scientific and educational support system may be a necessary

tool for encouraging a transition to organic farming. Therefore, information services in addition to "…market-based programs such as cost-sharing for conversion and market access improvement…" (Lohr & Salomonsson, 2000, p.133) could stimulate growth of organic agriculture (Lohr & Park, 2003).

Subsidies may be a necessary, but insufficient means of increasing organic production also due to farmer traditions. Many small organic farmers tend to be very independent-minded individuals who like the challenge of organic farming (McCann, Sullivan, Erickson, & De Young, 1997). These farmers thus seek to prove themselves without government support (Duram, 2005). A combination of compensating farmers via direct government subsidies, providing support services such as technical workshops, and setting up market influences through labeling programs is essential for promoting organic farming (Lotter, 2003).

Decision-Making in the Organic Food Market

People tend to do well at making decisions when they are given appropriate feedback about the current state of an unambiguous world with static stimuli (Shanteau, 1992). Unfortunately, the world is dynamic and ambiguous, especially when trying to confront environmental issues associated with food production. In some cases, producers and consumers in the food industry can be categorized based on their experience in the market and can be defined as experts. Defining experts in this decision-making realm usually entails a subjective understanding that certain individuals are "…recognized within their profession as having the necessary skills and abilities to perform at the highest level" (Shanteau, 1992, p.255).

Farmers who have been in the farming business for an extended period of time and often have had generational knowledge about farming passed down to them can, given high performance, be classified as experts. Expert farmers would also be defined based on regional and farmer-type differentiations. That is, there may be expert farmers for specific crops, climatic and soil conditions, and production techniques. Despite these potential distinctions among expert farmers, underlying behavioral traits that are common in all experts would still be relevant (Shanteau, 1992). The competence of the expert farmer depends on their domain knowledge developed over a long period of time, psychological traits, their ability to adapt to new situations, their capability to work under stress, and their ability to meaningfully organize information to analyze a problem and come up with an effective solutions (Glaser & Chi, 1988; Posner, 1988; Shanteau, 1992). Expert consumers would have similar characteristics.

Defining expert consumers is arguably a more challenging task, since there are limited measurable skills to assess. Expert consumers, in this case, are defined as those individuals who have made personal food purchasing decisions for a length of time of approximately ten years or more, and who are secure in their product choices. For people who regularly buy conventional products it therefore might be harder to switch to purchasing sustainable products, given the quick decisions that are made from past experience. Similarly, organic consumers could be more inclined to purchase organic products, as this is their habitual shopping response. In these circumstances, decisions could be made based on what one typically does in similar situations, rather than simply maximizing utility.

There are a variety of perspectives within the study of human decision-making seeking to identify why certain decisions are made. Rational choice theory, derived from the ideas of neoclassical utility maximization, is commonly used to model decisions and analyze everyday behaviors, such as deciding what food to eat or how to operate one's farm. Rational choice theory suggests that human behavior is dictated by decisions made to maximize utility given individual preferences and constraints. Although basic economic theory holds that consumers and farmer producers will make decisions to maximize utility or satisfaction, this does not mean that farmers are merely seeking to maximize profits or that consumers always take the cheapest options. Farmers and consumers instead are motivated by multiple goals that are often conflicting. Decisions vary greatly based on the complexity of the situation, a hierarchy of goals that change over time, and uncertainty due to ambiguity in the current state and lack of predictability in the certainty of results (Farmar-Bowers & Lane, 2009). Additionally, decision-making based on neoclassical utility theory assumes that values are commensurable, essentially reducing behavior to a measure of costs and benefits; however, people often use non-compensatory decision-making processes (Martinez de Anguita, Alonso, & Angeles Martin, 2007).[10]

As suggested by Rosenberger, Peterson, Clarke, and Brown (2003), choices reflecting environmental issues are often non-compensatory. People may have preferences for one commodity or lifestyle choice giving it priority over all other options due to it being an essential good, or due to moral or other types of values (Martinez de Anguita et al., 2007). Additionally, people use moral judgments in regard to

[10] Newer, more inclusive definitions of utility maximization theory may include "irrational" non-monetized values of utility, such as utility derived from altruistic behavior. Traditional neoclassical utility theory typically does not include these less established and hard to measure utility values.

environmental choices through moral commitments, most significantly in the form of "sacred values" (Tetlock, 2003). "Sacred values" are those values that are nearly absolute and are not considered as a potential trade-off for individuals or larger communities who hold that particular value, such as a value in the environment, in nature, in animal life, and so on (Tanner, 2009). In the rare circumstance that "sacred values" are present, they would outweigh any other values that could potentially play a role in decision-making. A farmer holding the "sacred value" that the environment must be protected would, for instance, maintain environmentally friendly production despite poor economic returns. Similarly, a consumer who strongly values the environment may buy organic products, although they cost more than non-organic products. In most cases, however, despite the values and attitudes to which a farmer or consumer might subscribe, decision-making is influenced by several factors besides "sacred values."

Consumer Decision-Making in Product Choices

Green products, in theory, are a reflection of goals to prevent, reduce, or reverse harmful environmental impacts on the natural planet. Green products try to resolve problems related to waste, pollution, and general environmental degradation. A green consumer therefore is one who purchases green products over conventional non-green counterparts; a green consumer would purchase organic products over conventional products. Recently, with the increase of environmental consumption, researchers have begun to attempt to define the behaviors and characteristics of green consumers using a variety of classification schemes.

One consumer decision-making theory focusing on green consumerism specifies that consumer decisions are influenced by information regarding the environment, knowledge, novelty, emotions, and subsidies. Green decision-making may also be affected by peer opinion, social-cultural norms, and personal factors (Straughan & Roberts, 1999). Green consumption theory defines five consumer values: 1) the functional value, or the consumer perception of green products, their price, and their quality, 2) the social value, or the utility provided to consumers, as influenced by peer opinion, rendering an association with one or more specific social groups, 3) the emotional value, or consumer emotions toward green products, 4) the conditional value, or the utility according to the specific purchasing situation, and 5) the epistemic value, or the consumer inclinations to desire knowledge and seek novelty (Lin & Huang, 2012).

The green consumer is also commonly defined by looking at four components: perceived consumer effectiveness, self-efficacy, social responsibility, and above all else the interaction of price, quality, and brand loyalty. Perceived consumer effectiveness addresses the extent to which a consumer can impact the environment, or how much an individual believes that their purchasing decision will affect the environment. If there is a high level of perceived consumer effectiveness, then green consumerism typically increases (Gilg, Barr, & Ford, 2005; Tucker, 1980). Those who feel that they have a greater ability to take part in green consumption (i.e. self-efficacy) and who furthermore feel morally responsible to do such (i.e. social responsibility) will have increased levels of green consumerism, as well (Sparks & Shepherd, 1992; Tucker, 1980). These components are limited by interactions of pricing, perceived quality, and habitual purchases.

Food choice is an integrative process. Decisions on food purchases take into account not only the more primitive motivations of short-term satiety and reward gained from particular food items, but also more complex cognitive and perceptual factors developing from both bottom-up processing and top-down processing. Visual aesthetic, social pressure, emotional state, and knowledge about particular product options are influential in consumer decision-making. Beyond economic models, but arguably inclusive of economic theories, researchers thus have studied consumer decision-making through the perspective of altruistic, social, attribute-based, and aesthetic-based influences that underlie food choices.

Altruism

Market behaviors are influenced by more than just individualistic motives. Studies show that at least some members of the greater public are willing to pay an additional premium for an alternative good – one that does not provide an equivalent direct individualistic benefit (Stern, Dietz, & Kalof, 1993). Like "sacred values," there is no utilitarian or monetary incentive to purchase the alternative good; instead, the altruistic consumer is motivated by the values that the individual holds. For instance, those with a greater sense of personal responsibility have a higher willingness to pay for recycled products, while other consumers are willing to pay more for products that are linked with charitable donations (Elfenbein & McManus, 2010; Guagnano, 2001). This altruistic behavior may be directed, in an expanded sense of the collectivity, toward non-human species or the biosphere in general, thus there similarly exists a market for green products that serve a public good beyond individualistic benefit (Stern et al., 1993).

Consumers can influence firms to engage in behaviors such as organic production and fair trade with their buying preferences, such as their willingness to pay additional money for products that are associated with socially responsible firms and for goods that are eco-consciously produced (e.g. organic food). Furthermore, opportunities to purchase green products might improve support for the environment, relative to situations in which only donations are possible (Kotchen, 2006). So, in addition to receiving warm glow utility and benefits from personal health improvements, green consumers may also value the public goods aspect of green products – valuing environmental quality. As such, those who engage in green consumer activities are more likely to hold altruistic values (Karp, 1996).

Pro-environmental behavior typically involves a trade-off between individual and collective benefit, so altruistic models are often used to conceptualize this "irrational" behavior. Altruistic behavior occurs when individuals are aware of the negative consequences of social conditions for others and assume responsibility for undertaking preventative action. To explain this behavior, social scientists have proposed that in modeling consumer behavior the purchase of "moral satisfaction" should be considered as part of the equation, since moral norms dictate many pro-environmental behaviors. While it is often asserted that self-interest dominates market behavior through rational choice, the importance of altruism in guiding these green consumption behaviors is significant, and arguably can be incorporated into the rational choice theory. The idea is that it is a rational decision to obtain a feeling of "warm glow" and thereby gain utility from an altruistic action. This consideration blurs the line of distinction made between what is individually optimal and what is collectively optimal, as the two may at times be

synonymous. With green consumerism, "altruistic moral norms may influence behavior as much as prices and expected utility associated with consumption" (Guagnano, 2001, p. 436).

Social Behavior

Social behavior also plays a significant role in the decision-making process of green consumers. This can best be understood from a cognitive perspective that shows that the brain often relies on simplifying heuristics when faced with complex decisions (Kahneman, 2003; Sunstein, 2005). One such decision-making strategy often used by individuals who have low consumer self-confidence and are more prone to conformity is observing the behaviors of other consumers. This is due to 1) the belief that other consumers have more information and/or 2) the individual at hand may be seeking to protect their self-image by following a reference group or individual (Simpson, Siguaw & Cadogan, 2008; Welsch & Kuhling, 2009).

The use of heuristics, such as the observation of others, allows for greater individual acceptance by peers, placing a larger emphasis on social norms than individual desires. Individual consumers thinking that others might hold more information or better information regarding product choice than the self represents a higher level and knowledge-based behavior. Peer behavior, regardless of its alignment with one's personal beliefs, overpowers the use of direct sensory input in determining product choice. For example, when a consumer witnesses peer shoppers purchasing conventional food products, then there is a high likelihood that that person will purchase conventional products as well. To diminish this effect, it would be crucial for a green consumer to

surround oneself with more environmentally conscious peers. The benefits of green consumer reference groups would also be expanded, since consumers with high environmental concerns are more likely to be worried about peer opinions regarding going green and related social approval (Lin & Huang, 2012).

Consumption patterns of reference persons significantly influence pro-environmental consumption, especially with organic food (Janssen & Jager, 2002; Welsch & Kuhling, 2009). Consumption serves not only individualistic needs, but social needs as well, through identity and community building. According to Janssen and Jager (2002), choice behavior is influenced by the following modes: 1) repetition of past habitual consumption patterns, 2) imitation of reference persons' consumption patterns, 3) social comparison, in which reference persons' consumption is imitated only if more satisfaction is obtained, and 4) deliberation to maximize overall satisfaction. The pro-social behavior from green consumerism can provide the consumer with added benefits and utility, such as reputation building, greater perceived trustworthiness, social inclusion, and higher status (Griskevicius, Tybur, & Van den Bergh, 2010).

Buying green products provides social cues of greater levels of altruism, as often these products have a price premium and therefore elicit signals that one is willing to incur an additional cost for others' benefit. Although environmental-friendly consumption is less than individually optimal cost-wise, there is a positive and significant association between life satisfaction and pro-environmental behavior, so this altruistic behavior provides utility through less quantifiable means (Welsch & Kuhling, 2010). However, consumers often underrate this utility from green consumption (Welsch & Kuhling, 2010). As such, people are more likely to choose green products over non-green

alternatives when shopping in public, but not when in private, as there is no status-driven social incentive in the private setting (Griskevicius et al., 2010). Therefore, by making the public audience more salient, people tend to act more environmentally friendly in regard to green product choices. For instance, when a confederate was obviously recording participant decision-making, over seventy percent of participants chose a green hand sanitizer; however, when participants did not know that their choice was being recorded, nearly the exact opposite was true – over seventy percent of participants chose a conventional hand sanitizer (Luchs, Naylor, Irwin, & Raghunathan, 2010). Reference persons' consumption and social comparison is thus important to understand, as "peer pressure may induce behavior without measurable occurrences…of personal responsibility or awareness of consequences operating" (Guagnano, 2001, p. 436).

Since everyday green consumer choices play an increasing role in the construction of a green identity, or environmental identity, this avenue can be used to create more sustainable movements overall. According to Cherrier (2006), influencing green ethical consumerism requires finding a compromise between consumer rights and moral obligations. Green ethical consumerism is promoted through defining consumer goods and consumption practices that have ethical meanings with respect to cultural, economic, political, social, and technological environments (Cherrier, 2006). Purchasing green goods helps develop an environmental identity where a consumer would continue on the pathway of green behaviors. Being a part of a group that has the same identity further solidifies this. Molding an environmental identity through green consumption would mean that values would eventually reflect a greater connection with nature and less emphasis would be placed on individualism and materialism (Hurth, 2010). By

acting individualistically and participating in green consumerism to affiliate with others and achieve social acceptance, or by acting strictly out of personal ethical social norms, consumer decisions are greatly influenced by the social sphere. This social sphere is influential because comparison to others provides an opportunity for symbolically defined consumption to encourage meaning and community building (Environics Int., 2002). Green consumption that acts as a symbol for social comparison and group recognition fosters environmental identity formation (Cherrier, 2006).

Attributes

Green consumer choices are not made solely on the basis of product environmental aspects and social values. Each market choice takes into consideration multiple variables aside from environmental values, such as price, convenience, psychological benefit and perceptions, personality characteristics, individualized situations, desire for knowledge, novelty seeking, and brand loyalty (Lin & Huang, 2012). Furthermore, recent research has shown that there is a growing reliance on environmentally labeled packaging in making a choice, such as a USDA labeled organic product, and hence an increased emphasis on ethical and environmental dimensions in product decision-making (Barr, 2003; Lin & Huang, 2012; Rokka & Uusitalo, 2008). Prerequisites for purchasing eco-labeled food products include: a concern for the environment, recognition that the product is environmentally friendly, (sometimes through an ecolabel reminder), environmental awareness, and beliefs about the advantages of the eco-product in relation to environmental and human health (Grankvist & Biel, 2001). For consumers who have enough income, price sensitivity is not

significant in determining the purchase of eco-products, as they are willing to pay more for these goods (Grankvist & Biel, 2001). As such, eco-conscious consumers, those with strong environmental preferences and quality concerns, demand more eco-labeled products when compared to consumers who are price-oriented (Schumacher, 2010).

Consumer demand for specific food product attributes has lead to an increased interest in food sector marketing. Many food claims differentiate products from one another, such as credence attributes that inform consumers of environmental and socially beneficial outcomes. Organic products, for instance, are more clearly distinguished by being credence goods, more so than search goods. Search goods are goods that allow consumers to directly evaluate relevant attribute information prior to making a purchasing decision (Moser, Raffaelli, & Thilmany-McFadden, 2011). These attributes include price, appearance, and size of a good. In general, the attributes of appearance and price have the largest influence over consumer choice of products (Hearne & Volcan, 2005). Yet, some people do not use the simplifying heuristic of product price solely, but rather gather a more holistic picture of the available products in making a purchasing decision (Meibner & Decker, 2010). Credence attributes, then, show that some products offer additional value, and consumers can make a purchasing decision based on ideas of these added attributes, as well.

Credence products have attribute information that is not easily ascertained by consumers during any stage of the purchasing and consumption process, making it difficult to assess their utility. These are the qualities that often require judgments to be made by authority figures, such as government agencies or trusted organizations that can provide certification (Moser et al., 2011). Credence goods also tend to provide affiliated

public benefits. An example of a food with credence values is one that is produced with organic methods. Organic foods are perceived as being safer for human health upon consumption, and they offer a public good by potentially reducing environmental impact. Attributes associated with organic products include health related concerns, production methods concerns, environmental and social benefits provided, and origin related attributes. Credence attributes overall greatly affect consumer purchases in the organics market.

Consumer demand for specific credence attributes associated with food products, such as organic and local foods, has grown considerably in the past couple of decades. And, with certification and labeling programs that differentiate products, specific attributes that influence consumer choice in the sustainable food market have become more apparent. Consumers who tend to purchase organics do so for a variety of reasons involving both sensory and non-sensory attributes of foods produced from the organic system; however, many studies have shown that food safety in regards to human health concerns is the largest motivating factor in the purchase of organic products (Hearne & Volcan, 2005; Shepherd et al., 2005). For instance, healthiness, through the absence of additives and residues and increased nutritional value, is one of the most important criteria for purchase of organic food (Shepherd et al., 2005). Organic production techniques that result in less pesticide residues are thus a key consideration made by consumers to obtain health benefits.

Although health benefits are the most strongly related attitudinal factor determining purchasing behavior of organic products, many people buy organic for perceived environmental benefits and related concerns (Shepherd et al., 2005). Some

studies suggest that willingness to pay a premium and high demand for such products as organically produced and local foods stem from environmental concerns, while others state that production and quality concerns – nutrition, small farm support, treatment of animals – also guide consumer choices (Moser et al, 2011; Thilmany, Bond, & Bond, 2008). In addition, some organic fruits and vegetables are bought due to their perceived superior quality, flavor, taste, texture, and freshness.

The two largest factors motivating consumer purchase of organic foods "… are, first, concerns for one's personal health, followed by concerns for the environment" (Shepherd et al., 2005, p. 352). Those who are more frequent buyers of organic food tend to be motivated by both stated factors, whereas those who purchase less frequently are typically motivated by just health concerns. According to the Whole Foods Market (2005), nearly two-thirds of Americans have tried organic products, citing avoidance of pesticides as their primary reason. Furthermore, thirty-five percent of respondents stated a willingness to pay a premium of at least 10% for organic produce (Bernard & Bernard, 2010).

Aesthetics and Perception

Food product choice is a complex decision, combining internal and external perceptual processes from food stimuli. Many complicated brain processes subconsciously influence consumer decisions. For example, eating and sometimes simply thinking about food prompts brain activation from a wide range of centers known to control homeostasis, satiety, reward, and more newly evolved brain structures in the frontal cortex. The reward center activation may result in a greater number of higher-fat foods being purchased and consumed as opposed to healthier produce options that do not

activate the powerful reward centers of the brain (Schur et al., 2009). In relation to organic food choices, less healthful primitive brain desires that push people to choose more processed foods over fruits and vegetables decreases the consumption of produce in general and thus decreases the demand for organic produce, as well.

One aspect of food choice criteria that is considered during the decision-making process is the outward appearance of actual food items, or the marketer's ability to capture the quality and other attributes of the food in packaging. A variety of research has been done within the realm of consumer psychology and marketing to identify how the design of a product through visual aesthetics factors into product evaluation and subsequent choice, perhaps in the form of ecolabelling or green product packaging design. When performance information, taste, quality, nutrition, and other choice factors of a particular food are unavailable within an individuals' knowledge repertoire, external design features of that food item tend to dominate overall judgment. For one, brand names and imagery have a significant impact on consumer decision-making, as the memory and stored knowledge of each particular brand systematically increases future purchases in favor of that same brand, irrespective of product type (Butler & Berry, 2001). People are drawn to products that are aesthetically pleasing, creating a significant bias in the decision-making process.

The aesthetic appeal of package design also plays a significant role in consumer choices. In an experiment done by Reimann, Zaichkowsky, Nauhaus, Bender, and Weber (2010) "aesthetic packages significantly increase the reaction time of consumers' choice responses" (p. 431). Not only did participants choose products quicker with an option of an aesthetically pleasing package, this factor also dominated other determining factors in

product choice, particularly the effects of well-known brands and pricing, (to an extent). The visual stimulus may have particular design, colors, or other features that people find visually pleasing. In addition, a person's past experiences and personal preferences may play a role in determining how pleasurable a given design is, providing positive associations with the layout, color, etc. Unfortunately for organic produce, aesthetically pleasing packaging is not a sustainable option, so information about the benefits of such produce must be powerful enough to overcome the aesthetic effect. Here, the integration of primary stimuli with experiential learning is essential.

There are times, however, when unattractive products can actually be advantageous and result in a greater preference for that product (Hoegg, Alba, & Dahl, 2010). This is because although brand names dominate overall quality judgments, prior knowledge in a top-down fashion greatly controls what products an individual consumer might decide to purchase. In Cornet, Shepherd, Hedderley, and Nanaykkara's (1994) study, consumer participants reported that a product's claim held higher weight in determining purchasing decision than a product's brand name. The negative aesthetic effect of unattractive goods can therefore be counteracted when perceived performance and functionality information is provided in accompaniment with the unattractive product – there is an opportunity to reconcile the conflicting visual and verbal information. Extending this idea to organic food purchases, it is apparent that the growing industry of organic products will have a difficult time overcoming the habit of consumers to use prior experiences to dictate future choices unless additional relevant information is provided.

If consumers are unfamiliar with the new organic products now being offered in grocery stores, they may never make the transition to purchasing organic products over

their conventional counterparts. On the other hand, it may be possible to prompt more purchases of organic food by having greater access to information with regard to the given product, and thus the undesirable aesthetic property would have a reduced impact on purchasing decisions. In essence, organic products that are both unfamiliar and potentially less attractive must be supplemented with sufficient information about added benefits and quality if they are to maintain a competitive edge. Having a standard USDA label for organic foods that is well trusted is therefore critical for market growth.

Limitations Due to the Attitude-Behavior Gap

Despite the benefits provided to human health and the environment from transitioning to organic methods of agricultural production, sales and output of organic products still remains small in comparison to conventional counterparts. Research in the field of consumer decision-making, especially in behavioral and experimental economics, sheds light on a partial explanation of this phenomenon – the attitude-behavior gap. Applied to this research, an attitude-behavior gap occurs when self-proclaimed levels of environmental concern are a poor predictor of behavioral intention or marketplace behavior (Soron, 2010; Verbeke et al., 2007; Vermeir & Verbeke, 2006; Young, Hwang, McDonald, & Oates, 2010). Attitudes are what people perceive to be true about an object or reality based upon beliefs and values that an individual holds. Attitudes are the underlying mechanism for behavior, the indicators of readiness to act, and the mindset upon which decisions are made. Attitudes, however, are not always consistent with everyday behavior.

The attitude-behavior gap is attributed to consumers not purchasing organic products regularly, despite having strong values and attitudes favoring organic products. For instance, Verbeke et al. (2007) found that although consumers assert a high-perceived importance of sustainability and ethical considerations of fishing, this belief did not correlate with their actual consumption of sustainable fish. The large disparity between consumer support of environmental protection via values and attitudes and their actual behavior means that such environmentally conscious values and attitudes are necessary, but insufficient conditions for reaching sustainability goals.

Many researchers suggest that a lack of consumer knowledge and awareness about organic food is an integral part of explaining the slow progress of organic sector expansion in the United States (Demeritt, 2002). Even those who already have some general knowledge about organics may not have sufficient information to differentiate between conventional and organic products and thus do not consider buying organic (Bonti-Ankomah & Yiridoe, 2006). For instance, uncertainty in organic characteristics can create a separation between intention to buy organic and actual purchasing behavior (Aertsens, Mondelaers, Verbeke, Buysse, & Van Huylenbroeck, 2011). Greater awareness and knowledge regarding organic food, therefore, tends to have a positive effect on attitudes about organic consumption (Padel & Foster, 2005; Saba & Messina, 2003).

Attitudes often do not translate into behavior due to both individual and collective barriers (Leiserowitz, Kates, & Parris, 2006). Individuals also often lack the resources, time, access, knowledge, power, skills, and/or perceived efficacy to translate their values into behavioral action (Leiserowitz et al., 2006). So, even when consumers are informed

and have a positive attitude toward the purchase of organic products, they are at the same time constrained by other barriers that can explain the gap between their attitudes and behavior. For one, current price structures of organic products, potentially due to limited supply and availability, places a constraint on many individuals who would buy organic if they had the income to due so. The price premium set on organic foods is one of the biggest obstacles in consumption. An individual might value organics highly, but may not have the means to actually purchase organics simply through monetary limitations. Increased prices are partially created due to structural hindrance, such as laws, regulations, contradictory subsidies, and political contexts that do not support organic agriculture and thus perpetuate the limited availability of organic options. This barrier due to structural impediments, such as the lack of subsidies to move the United States toward more organic production, can be addressed given a significant consumer willingness to pay for transitional organic products that signals citizen support for transitional legislation.

Furthermore, the disparity between attitudes and behavior can also be attributed to overall consumer satisfaction with the conventional system, and thus a lack of motivation to purchase organic despite potentially holding environmental values. Consumers may not believe that being organically produced is an important enough purchase criterion to motivate the purchase of organic food; in other words, they do not see added value in the organic industry (Verbeke et al., 2007). Consumers also may not perceive organic foods to have any significant improved taste or shelf life over their conventionally grown counterparts, so the price premium for organic products does not make sense and consumers are dissuaded from making such purchases. Others simply may prioritize

environmental values lower than other values, potentially perpetuated by social norms in specific regions.

The psychological aspects of the attitude-behavior gap, or that attitudes do not necessarily translate into actions, are important in understanding choice behavior. Even though behavior-behavior correlation[11] is assumed to be stronger than the attitude-behavior correlation with regard to environmental concerns associated with agricultural production techniques, "positive attitudes toward organic foods and other environmentally friendly practices significantly predict similar behaviors" (Dahm, Samonte, & Shows, 2009, p.195). Despite the large attitude-behavior gap, environmental attitudes do indeed influence consumer intentions to purchase environmentally sensitive products, even if through indirect means (Alwitt & Pitts, 1996).[12]

Farmer Decision-Making in Agricultural Production

With the heightened specialization and intensification of agriculture leading to declining biodiversity and other serious environmental problems, a new focus on sustainable agricultural production methods is becoming increasingly important.[13] In response, organic production as a form of sustainable agriculture is growing in popularity. Organic farming is theoretically intended to be part of the solution to global

[11] One example of a behavior-behavior relationship is an increase in performance of environmentally friendly behaviors contributing to an increase in organic food purchases.

[12] An attitude-behavior gap similarly exists in farmer decision-making, where environmentally friendly attitudes do not align with environmentally sound production practices due to a variety of barriers and other factors.

[13] The term "sustainable" incorporates economic, ecological, and social sustainability. A sustainable agricultural method must therefore allow farmers economic means to continue production, improve environmental conditions, and provide social community support.

and local environmental problems, and also works to preserve more regionally oriented farming and smaller-scale family farms that combat resource issues. Unfortunately, based on organic farming in the United States, this ideal of a small-farm organic movement is hindered by the fact that transitioning into the organic system has many barriers to entry in the form of high investment costs, lack of technical support, and lack of transition phase price premium to support farmers who make the decision to convert their farm to organic.

Attitudes that farmers have with regard to certain conservation practices and production techniques greatly impact their decision to adopt specific agricultural practices. For programs that compensate farmers for using specific environmentally friendly practices (e.g. organic production) to be most effective and to increase sustainable agricultural production overall, it is necessary to have a better understanding of how farmers react to incentive strategies, what the barriers to organic production are, and what motivates farmers to convert to organic systems. It is therefore important to recognize farmer attitudes toward conservation measures to understand decision-making processes regarding organic farming transitions.

Characteristics of Farmers: Attitudes and Values

Farmers can be seen as both land stewards and land abusers. On the one hand, farmers have a deep awareness of natural cycles – a local knowledge and appreciation of the land that gives them an upper hand in being able to care for and conserve their area for future generations (Sullivan, McCann, De Young, & Erickson, 1996). At least farmers tend to think so, as the majority of farmers surveyed in the United States claim that they

are good stewards and "sustainable managers of land resources" (Hanson, Kauffman, & Schauer, 1995). However, their utilitarian views can lead to misuse of the land and generations of pollution. As detailed previously, unsustainable farming decisions and production methods have resulted in substantial negative environmental consequences (Sullivan et al., 1996).

This dichotomous view can stem from the idea that farming incorporates a variety of different values. A farmer is typically defined as having a set of four dominant values that dictate their decisions, which are clumped into two broad categories – economic returns and job satisfaction. Economic values are the purely business-oriented decisions used for expanding or maintaining production and profit. Job satisfaction, on the other hand, is less explicit and incorporates three less quantifiable values: 1) social values, such as the prestige and traditions of farming, 2) expressive values, or the ownership pride and the challenge of farming, and 3) intrinsic values related to the enjoyment and independence brought by farming (Gasson, 1973). These underlying values – influenced by goals, type of farm, family obligations, etc. – form the basis of farmers' attitudes, which subsequently act as the foundational building blocks of behavior and decision-making.

Farmer Decision-Making in the Organics Market

"Farmers' decisions are made under great external pressure from the market, national laws, regulations and subsidy programs" (Ahnstrom et al., 2008, p.41). While consumers continue to demand cheaper yet more sustainably produced foods, farmers are faced with a dilemma of either maintaining high yields with a couple of well-adapted

crops or increase biodiversity and risk insufficient price structures with lower yields (i.e. organic farming). Those who do decide to make the transition to organic agricultural production can be thought of as doing so based on value systems, reputation, or economic profitability. Farming behavior related to production and environmentally oriented farming, as suggested by Willock et al. (1999b), depends on personality and external factors mediated by attitudes and objectives of an individual's farming. A farmer's decision framework to engage in organic farming can be viewed through a combination of four generalized lenses: 1) intrinsic environmental interest, 2) family-personal considerations, 3) social influence, and 4) financial motivation.

First, intrinsic environmental interest implies some greater ethical obligation to act in certain ways, such as partaking in organic agriculture to protect the environment and to sustain the land for future generations (Farmar-Bowers & Lane, 2009). This interest encompasses personal philosophical and ideological motivations that change over time depending on the commodity type and region, as well as environmental concerns, such as a preference for improved soil conditions or not wanting to use chemicals and a desire to live harmoniously with nature (Cranfield, Henson, & Holliday, 2010; Fairweather & Campbell, 1996; Sullivan et al., 1996). Second, family-personal considerations include health and safety concerns for oneself and one's family, as well as dissatisfaction with conventional farm work. Third, social influence establishes the social considerations applied to organic agriculture entailing a farming family wanting to maintain a reputation of being environmentally responsible, as organic production is viewed as honorable in certain regions (Farmar-Bowers & Lane, 2009). Social considerations could also include a farmer showing concern over consumer health

(Fairweather & Campbell, 1996). Fourth, aside from value and reputational factors, many farmers decide to make the transition to organics because of a desire to increase profits. If organic agriculture is profitable, it is a wise business decision to make the switch in the long run. In addition to seeking high premiums for organic products, farmers may also be motivated financially due to issues with conventional farming (Cranfield et al., 2010; Sullivan et al., 1996).

As previously mentioned, farmers' decisions are not driven solely by profit maximization (i.e. economic returns), but by socio-economic and psychological factors (i.e. job satisfaction), as well (Gasson, 1973; Willock et al., 1999a). Both economic incentives and environmental consciousness influence farmer decisions regarding participation in organic agriculture (Fairweather & Campell, 1996). For instance, having relevant information and knowledge about the harmful residues and pollution resulting from the overuse of chemicals, in combination with strong values about the topic, may lead farmers to consider less chemically intensive techniques. Arguments have been made that farmers often place the greatest weight on job satisfaction objectives, (particularly intrinsic values), more so than economic values (Gasson, 1973). This is supported by recent findings that farmers who decide to adopt organic farming methods tend to do so for environmental and ideological reasons over economic motivations (Theocharopoulos, et al., 2012). Cranfield et al. (2010) similarly found that organic farmers are predominately motivated by health, safety, and environmental concerns. This is not to say, however, that economic motivations are unimportant in organic conversion.

A positive attitude toward the environment and sustainability is nearly a necessity if conservation behavior is to be undertaken; however, this attitude may be a necessary

but insufficient condition for decisions toward adoption of organic agriculture. Although environmental concerns are relevant, there are other factors that dictate organic adoption. In terms of farmer environmental attitudes, studies have shown that despite an increase in awareness of environmental problems related to agriculture, profit motives can dominate decisions made by farmers relative to environmental motives (Willock et al., 1999b). For instance, farmers who are already engaged in integrated crop management (ICM)[14] are often motivated to adopt organic farming due to economic factors, rather than for environmental reasons (Theocharopoulos et al., 2012). These economic motivations are very relevant because in attaining sustainable farming production, a farmer must receive enough income to maintain output and a livelihood. The adoption of organic farming is thus heavily dependent on expectations of additional farm development and daily responsibilities (Best, 2009). Aspects such as pest and weed control and yield upkeep are particularly important in a farmer's decision to adoption organic agriculture, incorporating economic factors such as prices, marketing, and workload (Best, 2009).

Any given change in production practices must therefore be met with a psychologically willing farmer to make the changes, profit motives, and/or perception of farming values (Willock et al., 1999a). So, even when there is a shared common concern among farmers about the environmental impact of agriculture, organic and conventional farmers vary in their adoption of conservation practices (McCann et al., 1997). For organic farmers, an environmental concern is manifested in adoption of sustainable practices, but for conventional farmers the same concern does not cause behavioral change. In addressing this gap between farmer environmental attitudes and decision-

[14] Integrated Crop Management is a farming method common in Europe often thought of as a middle ground between organic and conventional farming.

making one can ask: What are the barriers presented to farmers in the United States as they attempt to transition to organic agriculture?

Barriers to Participation in Organic Agriculture

Transitioning to organic agriculture in the United States is undoubtedly a difficult process for many farmers. Not only do farmers need the motivation to participate in the organic system, they also need the ability to do as such via the support from external resources. In the United States, this needed government support is often lacking, resulting in a significant barrier to transition. Additionally, many farmers find that transitioning to an organic system requires too much initial input cost and too much time gaining the knowledge of how to operate in a different way. These farmers, who given enough experience can be categorized as experts at conventional farming, are forced outside of their domain expertise and are no longer able to make efficient decisions about their farming production at the onset of transition. Therefore, the uncertainty combined with a large investment of time and energy that must be devoted to learning new skills dissuades many farmers from making the switch. Many barriers are presented during the transitional phase of organic agriculture that makes sustainable agriculture less prevalent in our society today. These barriers to transition and organic production include: lack of government/institutional support, limited capital, negative external pressures by other farmers, financial hardship during the transition, issues with pest management and disease control, decreased productivity/yield declines, and acquiring personal management knowledge of organic production (Cranfield et al., 2010).

Any new opportunity to be undertaken, (with respect to the farm), must satisfy one or more of the farm family's motivations and must only require personal components, such current capital and knowledge, and immediate external components, such as training courses and markets (Farmar-Bowers & Lane, 2009). Many farmers decide not to convert to more sustainable farming systems due limited personal capacity and negligible external funding, resulting in economic uncertainty as an organic farmer. Organic production often results in a change in the input structure of the farm – less chemical inputs are replaced with higher labor costs to manage weed populations that were once controlled by chemicals instead. From a five-year study (1996-2001) of northern San Joaquin Valley cotton production, researchers found that organic fields have generally less favorable outcomes than both conventional and integrated pest management agricultural techniques (Swezey, Goldman, Bryer, & Nieto, 2007). Organic fields have more insect predators, lower plant density, and higher cost of production (particularly from lower yields and higher labor costs) (Swezey et al., 2007).

For the first years following transition, yields typically decrease as soils are rejuvenated to a more natural state and synthetic fertilizers are no longer used to produce high yields. Transitioning also requires high initial input costs, as new capital and labor are often needed. These non-ideal conditions, combined with a low price premium for certain organic crops, (especially with world markets driving prices down), can explain why certified organic products are only a tiny fraction of the total agricultural production (Swezey et al., 2007).[15] Unreliable wholesalers and markets for organic products only add to this situation. When there are no local distributors the positive externalities gained

[15] On the positive side, organic growers, who do not use synthetic insecticides, did not have to worry about pest insect abundance greater than action thresholds. And, the elimination of insecticides conserves beneficial insects (Swezey, 2007).

from organic production are diminished by the extended distancing required to transport products from the source of production. To make farming most profitable, agricultural production is therefore placed as a higher priority above conservation, (such as in the case of conventional farming where economic values outweigh environmental values).

Economic uncertainty during the transition phase of switching to organic production also presents a barrier to farmers making sustainable agriculture decisions. Not only do yields decrease and initial costs increase, there is also no economic premium during the transition (Sustainable Agriculture Network, 2007). Once interested in transitioning to organic farming a conventional farm must find an accredited certification body, which will examine farm operations and provide necessary information about becoming a certified organic producer. A certifying agency must grant certification after the transition has occurred. This step requires inspection fees and certification fees. Additionally, new policies and legislation regarding farming production tend to increase stress on the farmer, as administrative aspects of the trade increase. This is especially true for organic farming, which requires a large amount of paperwork to maintain certification. As a result, while many farmers may be concerned with sustainability measures, economic factors are a large barrier to adopting alternative practices. In the United States, higher income farms tend to use more chemically intensive farming techniques; however, contradictorily higher income farms also use more alternative practices and conservation programs because these farms have greater investment potential to take the risk of transitioning (Dick, 1992). This creates the reality that a small-farm organic movement has turned into a large-farm dominated industry.

Conservation practices, such as organic agriculture, must be put into a larger context of both the short-term and long-term goals of the farm. Transitioning to organic production involves the concepts of suitability and availability in the development of farming opportunities, as farmers deciding whether or not to adopt organic agriculture are making a fundamental decision that dictates the future organization of the farm (Best, 2009). Farmers must be willing to take a risk by making sometimes dramatic operational changes through learning new techniques and seeking out information in a definitive rather than gradual transition (Duram, 1999). Furthermore, farmer's goals may be influenced by the farm stage in a basic life cycle of generation, maturation, decline and regeneration. In an early phase, farmers may be more willing to take risks for the sake of farm growth, while in later periods risk aversion increases (Wallace & Moss, 2002). Farmers therefore tend to be risk averse and skeptical of new ideas, hence part of the reason why there is hesitation in switching from conventional to organic agriculture (Willock et al., 1999b).

An additional consequence of farm stage risk aversion is that organic farmers tend to be either large-scale capital-rich farmers or younger, part-time and smaller-scale farmers, whose income is not fully dependent on farming production (Best, 2009). The more educated young farmers, (typically in an earlier farm stage), appear to be more willing to engage in conservation programs, especially if the farm is a successor farm[16] (Wilson, 1996). Organic farmers also tend to be more challenge seeking and take a business-like approach to farming, where they welcome the challenges of the organic

[16] A successor farm is one in which has typically been passed down among generations of family farming and where the farm is intended to continue to be passed down to future family generations. It is for this reason that organic production seems to be more common in successor farms, because there is more at stake in wanting to keep the land in good condition for family to use in the future. A family-owned farm encourages responsible use of resources.

system and feel comfortable in their farm's output (Duram, 1999). Organic farms usually have more operational diversity and deal with changes well, being run by farmers who have a love of the land and often lack formal agricultural education (Duram, 1999). These "alternative" farmers are often in stark contrast to more conventionally trained farmers.

Relying on family farming traditions, the long-term goals of the farm may not include sustainability measures if information regarding environmental consequences is not available. One potential drawback of more natural conservation programs for agriculture is that farmers, particularly those in the Midwest, are more willing to participate in a system that results in "tidy" management habitats rather than untidy natural growth (Ahnstrom et al., 2008). This is because farmers are judged based the upkeep of their farms; a tidy landscape conveys to other farmers that one is a good steward. Farmers in California and Colorado, for instance, often enjoy camaraderie with other farmers, sharing a love of the land and taking pride in their work (Duram, 1999). This negative external pressure from other farmers acts as a socialized barrier for farmers who otherwise might consider organic farming.

Limited expertise and efficacy additionally contribute to the lack of willingness to convert to organic agriculture. Some farmers may not recognize their operation as part of an environmental problem, while others might think that their efforts are not worth it or will have no positive impact overall. Farmers may also lack experience, (and thus expertise), in organic farming, and they therefore may not believe that they have the required technical knowledge to make the transition. "The lack of scientific support along with technical and economic factors such as yields, profitability, and certification expenses, are the factors that mostly hinder the adoption of sustainable farming systems

by conventional producers" (Theocharopoulos et al., 2012, p.30). For instance, some of the main impediments to conventional and ICM farmers adopting organic farming stem from the lack of support networks and technical barriers (Theocharopoulos et al., 2012). These findings suggest that more technical assistance and support should be provided to farmers who are not currently using an organic system of production if the overall goal is to increase the application of this particular farming technique.

Although farmers may have environmental concerns, many do not explicitly see the economic sustainability of organic production, since structural and technical barriers are presented before any additional profits can be made. Additionally, the unpredictability of our environment makes decision-making in the organic market a difficult task. Once overcoming these hurdles, however, organic farms benefit from decreased exposure to harmful agricultural chemicals, improved food quality/increased nutritional quality of products, profitability, increased environmental fertility, biodiversity, decreased pollution and energy, positive spillovers for rural communities, and more (Cranfield et al., 2010). Unfortunately, there is no nationalized program for transitional certification to aid farmers in obtaining a price premium for products in transition. Funding via federal programs can potentially help these farms adopt conservation efforts and learn new ways of land management aside from conventional production; however, subsidies alone are not enough to create a willingness to join a program nor do they create a conservation ethic (Ryan, Erickson, & De Young, 2003). Beyond money, farmers need to feel supported with advice and engagement in a community that incorporates their local knowledge. The social norms, subjective norms,

farmer identity, and attitudes play a large factor in decision-making processes regarding sustainable agricultural methods, and in particular organic farming.

Consumers and producers of organic food are often times concerned about the negative externalities of intensive conventional agricultural production methods, yet the percentage of organic production remains startling low compared to less environmentally conscious conventional techniques. Much of this disparity can be explained through the analysis of farmer and consumer decision-making and an examination of barriers to organic conversion. Environmental decisions, such as decisions in the organics market, often times involve intergenerational consequences, temporal preferences, and multiple goals with multifaceted and complex interactions, making human decision-making difficult to handle, even for experts. Information from conflicting sources and efforts to combine different objectives and priorities from a range of stakeholders only makes the situation worse (Kiker, Bridges, Varghese, Seager, & Linkov, 2005). For farmers in particular, personal, family, and farm business objectives reflective of personality, lifestyle, and economic goals often interplay in decision-making processes (Wallace & Moss, 2002). For consumers, an interaction of social pressures, altruistic motives, attitudes about the environment, and information about agricultural systems can potentially influence decision-making behavior. Thus, farmers and consumer might use heuristic or intuitive approaches to simplify the complexity of the problem into a more manageable system (Kahneman, 2003; Sunstein, 2005). In effect, people may make less well-informed and thoughtful choices by ignoring vital information and the built in uncertainty of the system (Kiker et al., 2005; Shanteau, 1992).

Stated Preference

A variety of stated preference methods exist to elicit valuation of goods or particular attributes, addressing consumer attitudes and purchasing behavior regarding food choices. With stated preference, survey questions are used to yield a measured value based on indicated preferences as exemplified through monetary amounts, choices, ratings, or other similar methods. Stated preference surveys are important because they can utilize behavioral economics to better understand the intricacies of human behavior that influence preferences revealed in survey methods. The field of behavioral economics explores the reasoning behind empirical phenomena and anomalies identified with stated preference and experimental methods, incorporating the field of psychology and behavioral studies. Factors that are considered include emotions, fairness and altruism, social norms, and the like. With state preference economics, individual preferences, (even if they are "irrational"), are considered an important input for public policy (Carlsson, 2010).

Elicitation of food valuation is often done with contingent valuation and choice experiments estimating willingness to pay for specific attributes of foods. While contingent valuation, (i.e. hypothetical valuation), is often used to evaluate a product as a whole, conjoint choice experiments are able to evaluate bundles of attributes that define a good. Contingent valuation commonly uses a binary choice between the status quo at no additional cost versus a specific environmental good or bundle of goods at a certain price. This is a simplistic technique that gives a precise estimate of one bundle of goods; however, it is often important to distinguish what people are willing to pay for products with different characteristics set at variable prices.

A conjoint choice approach is ideal when trying to determine attributes of goods that consumers are willing to pay for. With conjoint choice, respondents are offered multiple choices with different attributes set at different prices in addition to the status quo. As a valuation of a non-market good, choice experiments can estimate willingness to pay for such a good based on providing a menu of alternative products with different attribute levels for participants to choose between. Choice experiments involve the construction of "…multiple scenarios, presenting a choice set and asking respondents to choose the preferred option among different attributes and prices" (Moser et al., 2011). Studies comparing choice experiments with contingent valuation methods have demonstrated that choice experiments are advantageous for assessing "multiple attributes and substitution, they may reduce 'yeah-saying' and protest responses, and they may be more sensitive to the scope of non-market goods…" (Hearne & Volcan, 2005, p. 384).

Stated preference is necessary for valuation of many environmental goods that do not have a market value. In other words, stated preference approaches are useful when nonmarket values need to be assessed. An advantage of stated preference over the typical reveal preference methods is that survey instruments allow the researchers to describe new goods under a hypothetical market with controlled or limited choice sets (Brown, 2003). Despite the value of state preference techniques, many traditional economists look down upon stated preference methods due to their hypothetical nature.

Many economists prefer revealed preferences to stated preferences. Revealed preferences are obtained from actual market behavior, while stated preferences are obtained from hypothetical scenarios. In figuring out the willingness to pay for particular products or product attributes via stated preference it is essential to consider confounding

factors that influence a respondents choice in a survey, such as the complexity of the assigned task and peoples' tendency to stick with the defaults and yeah-say. The second aspect to consider with regard to stated preference survey is the issue of distinguishing between incoherent preferences and learning. Inconsistent choices are not necessarily the conclusion to come up with when respondents do not have stable preferences in a choice experiment, as this could just be that the respondents are learning his or her preferences (Carlsson, 2010). Over time, working through the survey individuals may gather a clearer picture of what their actual preferences are for a give scenario. In consequence, it might be beneficial to have a few warm-up questions or ignore the responses to the first couple of questions to reduce this learning effect. Dealing with the hypothetical nature of the state preference design is complex, yet valuation of environmental goods is important for future protection and sustainability.

Environmental benefits are often excluded from cost-benefit analysis due to the lack of research. However, stated preference valuation can provide insight and additional information with regard to cost-benefits analysis of specific policies, especially in light of benefits to the environment and human health/well being. There are no significant markets in place for consumers to value their willingness to incur costs for organic products that are in transition. The environmental benefits may already be present, therefore efforts to determine willingness to pay for these associated benefits and others, such as benefits provided to human health and utility gained from altruistic behavior, should be assessed.

Considering the lack of available revealed market values for transitional organic produce, a stated preference approach is necessary. To determine the types of consumers

that display a significant willingness to pay (WTP) for transitional organic produce and the magnitude of this WTP, a conjoint choice survey is ideal. The willingness to pay for certain products that are produced under certain methods or systems that provide positive externalities, such as organic produce, should be correlated with a premium that people are willing to pay for improved welfare measures. Studies conducted by Lusk and Schroeder (2004) suggest that hypothetical choices overestimate willingness to pay, but others have found when comparing the hypothetical survey choices to more realistic experiment-based designs that stated preference holds up quite well (Carlsson, 2010). In any case it is important to be cautious when making statements about stated preference results in terms of actual behavior, but generating a WTP value for transitional organic produce is valuable for future environmental protection.

CHAPTER III

METHODS

Research Design

This stated preference survey was presented to respondents to collect data regarding consumer willingness to pay (WTP) for transitional organic produce and to assess the viability of a new agricultural certifying and labeling program for transitional organics. Using stated preference methods to derive WTP for this non-market good or limited-market good took the form of conjoint choice analysis. Respondents were asked about specific choice events under a given set of conditions regarding different types of produce (fruits and vegetables), cost, and quantity of purchase. Respondents are directed to take each purchasing decision as an individual choice occasion, so the purchases are not assumed to be cumulative. Using a discrete-choice random utility model, respondent choices are explained as a function of income and prices to determine inverse demand for specific goods based on estimated marginal utility parameters.

To elicit other explanatory variables to be used in respondent product choice models and to measure attitudinal support for transitional organics, a follow-up questionnaire is presented. Socio-demographic information is also collected to compare sample population statistics and to build parameters in the marginal utility model. Two kinds of support for transitional organic products are measured: attitudinal support as expressed through follow-up question answers, and behavioral support through reported behavioral intention via choice scenarios.

Survey Construction and Distribution

Survey construction was informed largely by literature reviewed in Chapter II, the American Community Survey and Census data, important feedback from talk-aloud participants, and by a similar choice experiment study done regarding humanely raised meats (Vander Naald & Cameron, 2011).

Choice Scenario Design

With stated preference methods respondents must construct their preferences on the spot. Therefore, considering context effects, if for instance more detailed information is provided than would regularly be presented during a real-life shopping experience, then demand for the products will not be as accurate as intended. However, considering that the transitional market is primarily a hypothetical market and the transitional USDA label is not a real label, information regarding the constructed transitional requirements was provided to respondents before they confronted choice scenario options. Respondents read the following transitional organic definition:

> "When a firm is trying to become a USDA organic producer, it is required to wait three years to allow the soil to refresh without the use of certain chemicals. After at least one year, crops produced are somewhere between conventional and USDA organic, something which the industry refers to as "transitional organic."

No other information about conventional or USDA organic requirements was provided to make sure that respondents were making subsequent food choices based on their current perceptions and knowledge about the agricultural products.

A concern with stated preference surveys is hypothetical bias. Hypothetical bias is introduced into the survey by asking hypothetical questions that are not forcing respondents to make decisions in the real world. The survey design therefore carefully

lays out instructions asking respondents to be as realistic as possible about their choices. Respondents were also prompted to consider factors that would normally influence their purchasing decisions, such as expected physical characteristics of different produce options and types (e.g. taste and appearance), as well as preferences of other people for whom food is normally bought, and their food budget constraints.

Stated preference consumer surveys have also been shown to result in an overstated willingness to pay, as respondents often try to please the researcher(s) or make future options available. To test for this tendency, half of the respondents were prompted with an introduction that stated that the results of the survey would be made available to policy-makers who have the authority to affect the availability and price of certain food options and therefore their choices could have real consequences. The other half of the respondents did not receive this "consequentiality" statement in the instructions of the survey.

Respondents were presented with six choice scenarios. A choice scenario lists a set of a finite number of alternatives, in this case four alternatives, that are mutually exclusive, (choosing one alternative excludes choosing other alternatives). Participants were instructed to indicate their preference for hypothetical purchase of a given type of produce, labeled as "Conventional," "Transitional USDA Organic," or "USDA Organic," as if they were making the decision on a regular shopping trip. An additional option in the choice scenario is designated as "None" in case the provided choice set prices are all too high or if the respondent does not typically purchase the given produce option. Since the demand for organic food tends to depend on the price differential compared to conventionally grown products more so than on the absolute price (Yiridoe et al., 2005),

the survey design of providing choices with direct comparison between the price levels of conventional, USDA transitional organic, and USDA organic could be a realistic indicator of preferences based on comparison of similar product price.

The six fruit and vegetable options used in this design include: Romaine lettuce, Russet potatoes, yellow onion, oranges, Fuji apples, and red grapes. These particular produce options were chosen because 1) all are among the top food crops consumed in the United States according to the USDA's Agricultural Marketing Resource Center (2012b), and 2) they represent a variety of produce types in which some have outer layers/peels that are typically removed and some that are directly consumed.

Produce prices offered in the choice scenarios varied across surveys, but the baseline price for conventional and organic options were determined by a two-year average, minimum, and maximum price of retail value levels in the Pacific Northwest as determined by the USDA Fruit and Vegetable Market News Branch, which details weekly market prices by region. Baseline prices and USDA organic price premium used for each produce option are listed in Table 1. Per-unit base price of conventional produce was varied randomly among three possible values for each fruit or vegetable type, while the organic price was set as an incremental value added this base price randomized by two values for each produce type.

The price of organic options was thus always higher than the price for conventional options of the same produce type. Transitional USDA organic prices were varied among seven different values based on fractional or equal scales. USDA transitional organic produce prices were established individually for each type of produce

as a fraction of the organic-conventional price difference (i.e. fractional pricing scale).[17] In addition to the fractional in-between price for transitional products, some choice sets presented a transitional price equivalent to the conventional price or equivalent to the organic price (i.e. equal price scale). This is to test whether or not people tend to stick to their habitual preferences despite getting a "better" product for the same price.

Table 1. **Prices and Quantities of Produce Listed in Choice Scenarios**

	Produce Type					
	Apples	**Grapes**	**Oranges**	**Potatoes**	**Lettuce**	**Onions**
Conventional Base Price (Per Unit)	$0.87	$1.47	$0.70	$0.43	$0.91	$0.37
	$1.05	$2.06	$1.05	$0.54	$1.03	$0.47
	$1.35	$2.62	$1.33	$0.65	$1.14	$0.57
Premium for Organic						
	$0.20	$0.45	$0.11	$0.34	$0.50	$0.40
	$0.30	$0.85	$0.35	$0.50	$0.65	$0.50
Quantity Presented						
	2 lbs.	1 lb.	2 lbs.	3 lbs.	1 head	1 lb.
	3 lbs.	2 lbs.	3 lbs.	4 lbs.	2 heads	2 lbs.
	4 lbs.		4 lbs.	5 lbs.		

The amount of produce given for purchase choice is randomly determined within realistic purchasing bounds for each produce type (see Table 1 for values). These different produce quantities were randomized across surveys. Adding in variable quantities of purchase controls for respondents choosing a higher priced option simply because they are only purchasing one unit of the good and the relative cost therefore is seemingly insignificant.

[17] Fractional differences to estimate prices for transitional produce were: .10, .25, .50, .75, and .90

A sample choice scenario survey is provided (Appendix A), showing one of the two hundred different versions of the stated preference survey that was administered, (as adopted from Vander Naald & Cameron, 2011). MS Word's "mailmerge" function was used to generate the unique versions of the survey. To control for order effects, the purchase quantity, prices according to baseline prices, the ordering of choice alternatives (i.e. which produce options are encountered first to last), and the position of conventional and organic options in the choice scenario table are all randomly varied across surveys.[18]

Follow-up Question Design

In addition to the choice scenarios to determine WTP for transitional organic produce, this study also focused on the relationship between consumer attitudes and product choices. Twenty questions related to respondent choices were asked to control for a variety of attitudinal characteristics behind consumer decision-making. These follow-up questions also provided an assessment of the survey construct validity, (or how realistic the choice scenarios are representative of actual purchasing options encountered by the respondents). Most attitudinal questions were asked using a Likert-like rating scale of 1 to 7. Other questions were presented as yes/no/not sure answers, some were fill-in options, and some were a selection of variable answers.

The large diversity of ecolabels and certification programs that are not based on nationalized standards makes it difficult for consumers to know which products are actually better in quality. Consumer understanding and beliefs of what the ecolabels stand for or the effectiveness of the agricultural production technique behind the ecolabel are

[18] The order in which the three types/labels of products were presented to respondents was randomly varied; however, the transitional label always appeared in between the conventional and organic labels and the "None" option always appeared last.

therefore important to identify. Since the labels of conventional, transitional USDA organic, and USDA organic are the main attribute examined in this survey, respondents are asked follow up questions to determine this understanding and attitudes about organic agriculture. In light of common misunderstandings of the organic label, one survey question addressed respondent awareness of USDA organic certification.[19] Information about respondent beliefs in the labels and their beliefs in the different production techniques was identified by asking respondents how healthy they think each production method's products are and how much they believe organic farming improves environmental conditions.

Other attributes aside from just the label of said products or the attributes provided in the survey might be in play during consumer decision-making. Therefore, attitudinal questions were asked in association with the decisions consumers made to better understand behavioral dimensions of purchasing intentions in the organics market and to verify the validity of the survey through comparison to other findings. Questions were asked regarding the extent to which certain attributes influenced food choices, such as price, environmental factors, appearance, and health.[20]

Questions to measure the validity of the values presented in the choice scenarios were asked of respondents. Both the price and quantity were asked in relation to what individual respondents would encounter in reality. Also to control for the hypothetical nature of the survey design, a question was asked regarding how confident respondents

[19] Question 3: Are you aware of the standards for USDA organic certification?

[20] Questions 5-8: To what extent does…price/environmental factors/appearance/health… influence your purchasing decisions?

were that when they shop they would actually make the same choices as they did in the survey.

In order to determine what types of consumers are willing to purchase transitional organic goods and to add information for the model, questions were also asked regarding typical shopping experiences of respondents. One particular question asks respondents to mark which type of produce they typically purchase based on production style: conventional, transitional, or organic. Other questions ask about the number of people respondents buy food for, how many times per month respondents buy each type of produce, and where respondents shop for food. To determine how environmental identities influence product choices, a question was also asked about how much the respondent identified as an environmentalist.

One critical concern with survey data is that respondents may attempt to guess the motivation of the researcher(s) and answer based on those assumptions. In some cases respondents may try to please the researcher and answer based on what they believe the researcher wants them to choose, and in other cases respondents may subconsciously answer in a direction against the researcher to compensate for this bias. To measure the researcher bias presented in this survey, questions were asked regarding how much respondents thought it was important to the researchers to buy 1) conventional products and 2) organic products.

Socio-demographic Question Design

A series of seven socio-demographic questions were asked at the end of the survey. These questions provide valuable information for the model regarding income,

add to a growing body of literature on characteristics of organic consumers, and are used to identify a new population of transitional organic consumers. The socio-demographic characteristics measured include: gender, age, education, political ideology (on a spectrum of liberal to conservative), race and ethnicity, zip code, and income. The categories for these characteristics and wording of the questions were adapted from the American Community Survey administered by the United States Census Bureau, as this is the source against which sample socio-demographic data is compared. These socio-demographic questions are essential to verify the representativeness of the sample to Lane County residents, to Oregon residents, and to the general population of the United States.

Participant Population, Recruitment Procedures, and Data Collection

Pre-Survey Implementation Think-Aloud Test Participants

Prior to survey implementation volunteer participants were recruited to take part in a think aloud session. This session served the purpose of helping to get rid of any perceived bias in the survey and to determine proper language. These volunteers did not participate in the actual study, but aided in developing a more clear survey to implement. Test participants were read an informed consent document prior to beginning the think aloud session (Appendix B). Twenty think-aloud test participants gave feedback on survey accessibility and design. Volunteers for this process included eleven females (ranging in age from 19 to 63) and nine males (ranging in age from 30 to 77). Participants also varied greatly in educational background and income level.

Participants were asked to go through the survey, as if they were taking it and talk aloud about any feedback or questions that came up along the way, including editing issues. Some of the changes made through this process included:

> 1) The addition of questions 19 and 20 regarding an explicit question about willingness to pay a premium for transitional organic and support for organic transition subsidies.[21]
>
> 2) Wording changes were made to the introductory section to reduce researcher bias and to prompt respondents to keep in mind expected differences between food options.
>
> 3) Elimination of a question regarding moral dimensions in the decision-making process because it made participants uncomfortable.
>
> 4) Changing the wording of socio-demographic question number five about ethnicity to include race and ethnicity in one category rather than having separate questions about race and Hispanic origin.[22]

After the think aloud process was completed, the revised survey was sent back to the twenty volunteers to make sure feedback was properly addressed and for feedback on any additional changes to be made before the survey went into the field.

Study Participants

Two hundred surveys were completed by potential jurors from the Lane County Courthouse located on 125 East 8th Ave., Eugene, OR 97408 during February and March 2013. While awaiting jury duty appointments, citizens of Lane County were invited to

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[21] Question 19: Would you be willing, in principle, to pay a premium for transitional organic produce if doing so helped farmers convert to organic production?
Question 20: Do you think that government subsidies should be provided to farmers to help them convert to organic production?

[22] There is much debate about the appropriateness of race measurements in U.S. socio-demographic questionnaires such as the American Community Survey and the U.S. Census. Combining race and ethnicity into one question was used to alleviate negative associations and uncomfortable feelings aroused during survey completion, despite being different from the standard form for collection of this information in the U.S.

volunteer to participate in the detailed food choices survey. The resultant population of respondents was therefore comprised of adults residing in the Lane County jurisdiction. This guaranteed that all participants were at least 18 years of age. No other exclusions or qualifications were made.

According to the Lane County Circuit Court (2013) the jury pool population consists generally of adults, (any person of at least 18 years of age), who are citizens of the United States residing in Lane County. Under the Oregon law, jury service cannot be denied on the basis of race, gender, age, income, occupation, religious beliefs, or any other discriminating factor. This allows for a wide variety of socio-demographic characteristics in respondents.

Typically, jurors are randomly selected from a list of registered voters and licensed drivers who reside within the jurisdiction. Excluded from this population are people who served on jury duty within the last two years and individuals convicted of a felony.[23] Also excluded from this sample population are people who are excused from jury duty automatically including people over the age of seventy and women who are breast-feeding a child/children. People may also request to be excused from jury service if the duty would cause them undue hardship or if one is the caregiver of a dependent during the normal court hours and no alternative is available due to certain circumstances (Lane County Circuit Court, 2013). Due to these exceptions, elderly individuals, those who have young children, and those who are prior felons may not be well represented by this sample. Also, people who elect not to get a drivers license and/or vote would also be excluded from this sample.

[23] Individuals convicted of a misdemeanor involving violence within the past five years are also ineligible for jury duty.

Aside from those populations, however, using the jury pool as a representative sample of Lane County residents is a cost-effective means of gathering information from respondents of potentially diverse backgrounds. Portions of Lane County, particularly the university-dominated community of Eugene, (which holds 43% of the population), are relatively liberal; however, adjacent communities in the larger metropolitan area of Lane County are more conservative, such as the city of Springfield. To help assess the representativeness of the survey sample, characteristics of respondents are compared to county, state, and United States socio-demographic data provide by the American Community Survey's three-year estimates from 2009 to 2011.

Data Collection

Other critical components of survey design include controlling for context dependence. Context, such as whether or not a respondent is being observed, how the questions are framed, characteristics of the interviewer/solicitor, etc., affects respondent behavior (Carlsson, 2010). To make sure that researcher observation and characteristics of the researchers did not influence respondent choices, survey booklets were hand-delivered to the Lane County Clerk, Dana Finley, who graciously distributed the surveys with the help of her assistants Lisa Baker and Nadine Pratt. Having the researchers not present for survey distribution takes out any component of researcher presence biasing the survey-takers. Survey completion was not monitored, as well, so as to reduce effects of respondent observation on choices. Surveys were picked up after they were completed at the end of the week in which the surveys were dropped off. Respondents were informed of the following, as presented by the jury clerk, before taking the survey:

1) The survey will take approximately 10 to 15 minutes.

2) Once finished with the survey respondents were told to return the completed survey to the sealed box on the front table labeled “return surveys here.”
3) If respondents requested a copy of the informed consent document for their records, they were given the email address of the researcher who would subsequently send them a copy.

4) Since page two of the survey has very important background information and instructions for what to do in the survey, respondents were told to pay special attention that the survey is printed double-sided and to carefully read page two before completing the rest of the survey.

The result of this convenient sampling method means that response rates cannot be accurately measured and systematic selection on unobservable effects cannot be assessed.

Data Analysis

A conjoint choice stated preference survey was implemented to reveal systematic heterogeneity in preferences for transitional organic produce. Using Stata 12.0 statistical software, a conditional logit model was used to estimate consumer WTP premium for transitional organic produce. Other statistical tests have also been conducted, mainly Chi-squared tests and summary statistics, to assess the construct validity of the survey, to explain interactions among attitudinal characteristics and choices, and to determine the representativeness of the sample.

Conditional Logit Choice Model

The conditional logit choice model allows one to determine the probability that a person chooses a particular alternative, expressed as a function of other variables related to the alternatives provided in the choice scenarios. The conditional logit model is an extension of the multinomial logit model that is useful in modeling choice behaviors

(Rodriguez, 2012). The explanatory variables, in this case, include attributes of the choice alternatives (i.e. produce label, cost, and quantity), as well as individual characteristics of the respondents making the choices, such as income, to construct a utility value. This allows for determination of how consumer choices are made based on the aspects of the products available, or how the characteristics of the categories themselves affect respondent likelihood of falling in that category of consumption (Gullickson, 2005).

Attributes of the choices (transitional, organic, price, etc.) and characteristics of the consumer (income, age, gender, etc.) are built in to the model. As adapted from Vander Naald and Cameron's (2011) model, the indirect utility of each alternative in a given choice set is a function of the cost and quantity for each choice and the income remaining after the purchase. From this, a WTP function can be determined. The hypothesis that respondents are willing to pay a premium for transitional organic produce over conventional produce is tested.

To understand the basis of general models of choice, suppose that Y_i represents a discrete choice of a respondent (i) among J alternatives. The value or utility of the j-th choice to the i-th individual is represented by U_i^j, which is treated as an independent random variable with a systematic component (h_i^j) and a random, or error, component (ε_i^j) such that

$$U_i^j = h_i^j + \varepsilon_i^j.$$

Assuming that respondents act in a rational way to maximize their utility, a respondent should choose alternative j if U_i^j is the largest possible utility (Rodriguez, 2012).[24] With multinomial logit models, then expected utilities h_i^j are based on characteristics of the

[24] This maximized utility includes utility from altruistic feel-good motives and external social utility.

respondent. Where β_j regression coefficient represents the effects of covariates on the utility of making a given choice, and x_i^j represents the respondent characteristics of all *J* choices

$$h_i^j = x_i^j \beta_j .$$

Instead of only using attributes of individuals to model expected utilities (h_i^j), McFadden (1973) suggests using characteristics of the alternatives. This is called a conditional logit model. The main effect is represented in terms of covariates z_i^j (Rodriguez, 2012). In this case, if z_i^j is a vector of *j*-th alternative characteristics, then

$$h_i^j = z_i^j \alpha .$$

Similarly, in the conditional logit model since each respondent gets a value for each of the available potential options in the choice scenario, then when z_i^j represents covariates that are outcome varying

$$\log P_i^j / P_i^{j'} = (z_i^j - z_i^{j'})' \alpha,$$

so that α is a coefficient measuring how the characteristics of each outcome/option affect respondents' choices between the selected options.

Alternative models use a combination of both multinomial and conditional influences. This would mean that underlying utilities (h_i^j) are dependent upon both the characteristics of the respondents and the choice attributes. The choice alternative/option and individual characteristics also determine the likelihood that certain options are chosen. This model would work off of the basis that if x_i^j represents respondent characteristics constant across choices and z_i^j represents characteristics varied across choices then

$$\log P_i^j / P_i^{j'} = (z_i^j - z_i^{j'})'\alpha + x_i^j(\beta_j - \beta_{j'}) \text{ and } h_i^j = x_i^j\beta_j + z_i^j\alpha \ .$$

To generate a specific conditional logit model for this study, the theoretical understanding of the above-mentioned generalized models are used.[25] The indirect utility for each alternative in the choice scenario is determined as a function of the respondent's income remaining after purchase decision and the quantity of product purchased. The "None" option in the choice scenarios represents a no-purchase decision involving no cost. To start with a simpler model, differences in utility from attributes of each produce type are ignored. The utility U_i^j is a function of the cost of purchase c_i^j and quantity of purchase q_i^j of which are described to each respondent (*i*) in the choice scenario with alternatives *j* =*C, T, O, N* (where *C* = conventional, *T* = transitional USDA organic, *O* = USDA organic, and *N* = none). The status quo dummy ($\gamma statquo^j$) is simply an indicator switched on for selection of choice alternative *N* and off for the rest of the alternatives. This accommodates for the non-forced-choice nature of the choice sets. Respondents are free to choose to purchase nothing if they object to the pricing options or if they dislike the produce option(s). The indirect utility function is thereby defined by two parameters 1) β_Y or the marginal utility of net income and 2) β or the marginal utility of a unit (pound or head) of produce such that

$$U_i^j = \beta_Y(Y_i - c_i^j) + \beta q_i^j + \eta_i^j, \ j \ = \ C, \ T, \ O$$
$$U_i^N = \beta_Y(Y_i) + \gamma statquo^j + \eta_i^N \quad .$$

The net indirect utility is then calculated compared to the no-purchase "None" choice for alternative *j* = *C, T, O*:

[25] The model is adapted from that used by Vander Naald and Cameron's (2011) model to determine WTP for humanely raised chicken.

$$\Delta U_i^j = (U_i^j - U_i^N) = \beta_Y(-c_i^j) + \gamma\, statquo^j + \beta q_i^j + (\eta_i^j - \eta_i^N) = \Delta V_i^j + \varepsilon_i^j.$$

(1)

The conditional logit choice model assumes that respondents will choose the alternative that allows for the highest individual indirect utility from the choice scenario (Greene, 2008). The conditional logit assumptions of the distributions for the stochastic terms, ε_i^C, ε_i^T, and ε_i^O, with a common error in variance leads to choice probabilities expressed in terms of observable utility for alternatives *j = C, T, O* and for the no-purchase alternative *N* such that:

$$P_i^j = \frac{\exp(V_i^j - V_i^N)}{\exp(V_i^C - V_i^N) + \exp(V_i^T - V_i^N) + \exp(V_i^O - V_i^N) + 1}$$

$$P_i^N = \frac{1}{\exp(V_i^C - V_i^N) + \exp(V_i^T - V_i^N) + \exp(V_i^O - V_i^N) + 1}.$$

Estimates for the unknown utility parameters β_Y (marginal indirect utility of net income) and β (marginal utility per unit of produce) are achieved with maximization of the log-likelihood function with C_i, T_i, O_i, N_i = 1 if the respondent chooses the given alternative and C_i, T_i, O_i, N_i = 0 if not:

$$L = \prod_{i=1}^{n} \left[P_i^C\right]^{C_i} \left[P_i^T\right]^{T_i} \left[P_i^O\right]^{O_i} \left[P_i^N\right]^{N_i}.$$

(2)

With the unknown parameters featured in the indirect utility function to be estimated, individual maximum WTP for discrete choices of produce of given quantities can be determined. Maximum WTP is known as the indifference price between being willing to pay for the produce and forgoing consumption. This indifference thus implies that the utility between the two options (purchasing or not purchasing) is the same. The

estimated indirect utility difference for alternatives *j* = *C*, *T*, *O* is set to zero ($0 = \Delta V_i^j = \beta_0\left(-c_i^{j^*}\right) + \gamma statquo^j + \beta q_i^j + \varepsilon_i^j$) and produce cost $c_i^{j^*}$ is solved for. The cost of produce $c_i^{j^*}$ is interpreted as the maximum WTP at any given q_i^j. This WTP for the marginal consumer is calculated with the following equation when $\varepsilon_i^j = (\eta_i^j - \eta_i^N)$:

$$\beta_Y(c_i^j) = \gamma statquo^j + \beta q_i^j + \varepsilon_i^j \Rightarrow c_i^{j^*} = \left(\frac{\gamma statquo^j}{\beta_Y}\right) + \left(\frac{\beta}{\beta_Y}\right) q_i^j + \left(\frac{\varepsilon_i^j}{\beta_Y}\right) \quad . \tag{3}$$

Since e_i^j / β_Y (the error term) is assumed to be zero, the expected maximum WTP for a unit of produce is determined by the marginal utility per unit of produce over the marginal utility per dollar of income, as stated previously. To determine the differences in WTP across produce type of conventional, transitional, and organic the marginal utility per unit of produce must vary systematically with the given produce type. Baseline marginal utility per unit of product will therefore be based on conventional produce, β_C, which shifts by β_T for transitional produce and by β_O for organic produce. Indirect utility-differences for alternatives *j* = *C*, *T*, *O* are generated by

$$\Delta U_i^j = \beta_Y\left(-c_i^j\right) + \gamma statquo^j + \left[\beta_C + \beta_T T_i^j + \beta_O O_i^j\right] q_i^j + \varepsilon_i^j, \tag{4}$$

where $T_i^j = O_i^j = 0$ if respondent choice is conventional and T_i^j, $O_i^j = 1$ if the respective product is chosen. Willingness to pay for a unit of produce is defined by the following equation:

$$WTP = c_i^j = \frac{\gamma statquo^j}{\beta_Y} + \frac{\left[\beta_C + \beta_T T_i^j + \beta_O O_i^j\right] q_i^j}{\beta_Y} + \frac{\varepsilon_i^j}{\beta_Y} \quad .$$

(5)

The hypothesis that respondents are willing to pay more for transitional or organic produce can be tested with the statistical tests that $\beta_T > 0$ and $\beta_O > 0$, respectively. (If statistical tests show that values are not significantly different than zero, then respondents are not willing to pay more for transitional or organic produce than for conventional produce.) If values are found to be different than zero, (statistically speaking), the estimate for per-unit WTP premium is β_T / β_Y and β_O / β_Y for transitional and organic produce, respectively.

So far, this model only deals with attributes of alternatives provided in the choice scenarios, but many other factors contribute to consumer purchasing decisions beyond product attributes, such as environmental values, socio-demographic determinants, and perceptions of agricultural systems. To incorporate these individual respondent characteristics and perceptions, each scalar parameter in the simple utility-difference function in equation (4) is generalized to be a systematic varying parameter instead. This systematic heterogeneity in the model is presented through different types and quantities of shift variables for each marginal utility. Variables X_i^C, X_i^T, and X_i^O adjust for the marginal utility of conventional products and the differentials in marginal utility for transitional and organic products. The utility difference emphasizing systematic heterogeneity in marginal utility can now be determined, where:

$$\Delta U_i^j = \beta_Y \left(-c_i^j\right) + \gamma\, statquo^j + \left[\left(\beta_C X_i^C\right) + \left(\beta_T X_i^T\right) T_i^j + \left(\beta_O X_i^O\right) O_i^j\right] q_i^j + \varepsilon_i^j \quad .$$

(6)

With the added heterogeneity, WTP for a given quantity of produce is now given by the following, (assuming linearity):

$$WTP_i^{j*} = \frac{\gamma}{\beta_Y} statquo^j + \left[\left(\frac{\beta_C}{\beta_Y} X_i^C \right) + \left(\frac{\beta_T}{\beta_Y} X_i^T \right) T_i^j + \left(\frac{\beta_O}{\beta_Y} X_i^O \right) O_i^j \right] q_i^j + \frac{\varepsilon_i^j}{\beta_Y} \quad . \tag{7}$$

Marginal WTP (MWTP) can then be defined as :

$$MWTP_i^j = \frac{\partial WTP_i^{j*}}{\partial q_i^j} = \left[\left(\frac{\beta_C}{\beta_Y} X_i^C \right) + \left(\frac{\beta_T}{\beta_Y} X_i^T \right) T_i^j + \left(\frac{\beta_O}{\beta_Y} X_i^O \right) O_i^j \right] \text{, and}$$

the per-unit WTP premia for transitional organic produce and organic produce by type and quantity, respectively, are given by the partial derivatives such that

$$\frac{\partial MWTP_i^j}{\partial T_i^j} = \frac{\partial}{\partial T_i^j} \left(\frac{\partial WTP_i^{j*}}{\partial q_i^j} \right) = \left(\frac{\beta_T}{\beta_Y} X_i^T \right) \text{ and } \frac{\partial MWTP_i^j}{\partial O_i^j} = \frac{\partial}{\partial O_i^j} \left(\frac{\partial WTP_i^{j*}}{\partial q_i^j} \right) = \left(\frac{\beta_O}{\beta_Y} X_i^O \right). \tag{8}$$

Despite the shortcomings of stated preference methods with the potential for hypothetical bias and overstated willingness to pay, a conditional logit choice model can be used to estimate consumer WTP for transitional organic produce. Preferences of respondents are determined by the alternative conveying the highest possible indirect utility out of the choice set. The use of this model in determining willingness to pay for specific attributes of choice alternatives allows for a more accurate representation of WTP based on controls for subject demographics and attitudes with regard to produce varieties that also inform of construct validity. Shift variables that are robustly statistically significant are integrated into the specification to shed light on consumer characteristics associated with support for transitional organic produce options.

CHAPTER IV

FINDINGS AND ANALYSIS

Willingness to Pay for Transitional Organic Produce

It is commonly assumed that WTP is additive – that the sum of the WTP for each individual aspect of organics will equal the total WTP; however, this simplification does not always hold true in real-market applications. Results of Bernard and Bernard's (2010) study show that "consumers are willing to pay significant premiums for organic and its parts over conventional versions…" (p. 473). There is a strong substitute relationship between an organic product and its subsidiary parts. Essentially, there is no significant difference between the organic premiums, as a whole, compared to the individual benefits people believe they obtain from organic produce. If consumers are willing to pay for single attributes associated with organics, then there might also exist a significant WTP for transitional organic that also holds some of these similar characteristics. Results from this study show just that – there is a significant WTP for transitional organic produce in a subset of the population.

Characteristics of Transitional Organic Consumers

Overall, respondents indicated that appearance was the most important factor in deciding what type of produce to buy, when compared to pricing, environmental, and health factors. Respondents selected one of seven valued numbers to indicate the extent to which each factor influenced their purchasing decisions from low to high. When asked to what extent appearance influences purchasing decisions, seventy-eight percent (78%) of respondents selected a value of a six or seven, denoting appearance as having a lot of

influence (Table 2). Health factors were the next important, followed by price. Environmental factors were a less important consideration for a larger portion of respondents, as only 30.5% of respondents reported that environmental factors ranked as a six or seven in influencing purchasing decisions (Table 2). The influence of these factors is used to inform about the subset of the population who would likely engage in the transitional and organic market. Based on these attitudinal factors and other respondent characteristics, variables were generated to determine the constituency of transitional organic consumers (for a definitions of these variables, see Table 3).

Table 2. Summary Statistics of Attitudinal Questions Regarding Purchasing Behavior, (sample *n* = 200)

Question Asked	*Q.5 To what extent do **prices** influence purchasing decisions.*	*Q.6 To what extent do **environmental** factors influence purchasing decisions.*	*Q.7 To what extent does produce **appearance** influence purchasing decisions.*	*Q.8 To what extent do **health** factors influence purchasing decisions.*
Response	Percentage of Respondents			
0	2.0%	2.5%	2.0%	2.5%
1	5.5%	8.5%	0.5%	2.5%
2	5.5%	12.0%	1.5%	3.0%
3	10.0%	11.0%	0.5%	4.5%
4	13.0%	**20.0%**	8.0%	17.0%
5	20.5%	15.5%	9.5%	21.0%
6	15.5%	13.5%	27.5%	18.0%
7	**28.0%**	17.0%	**50.5%**	**31.5%**
Mean	5.000	4.338	6.153	5.369
Std. Dev.	1.802	1.886	1.155	1.545

*Questions presented here are truncated. Please see Appendix A for complete survey questions.
[0 = no response, 1 = not at all, 7 = a lot]

Table 3. Description of Variables Generated for the Conditional Logit Model

Variable Name	Description of Variable
Tran Healthy	Transitional produce is healthy denoted by selection of a 6 or 7 on Question #12 (33% of respondents)
Organic Healthy	Organic produce is healthy denoted by selection of a 6 or 7 on Question #11 (58.5% of respondents)
Price shopper	Shoppers influenced by price denoted by selection of a 5, 6, or 7 on Question #5 (65% of respondents)
Appearance shopper	Shoppers influenced by appearance denoted by selection of a 7 on Question #7 (50.5% of respondents)
Health shopper	Shoppers influenced by health factors denoted by selection of a 6 or 7 on Question #8 (49.5% of respondents)
Enviro shopper	Shoppers influenced by environmental factors denoted by selection of a 6 or 7 on Question #8 (30.5% of respondents)
Female	Female (49% of respondents)
Conservatism	Conservative political ideology denoted by selection of a 6 or 7 on socio-demographic Question #4 (15% of respondents)
Liberalism	Liberal political ideology denoted by selection of a 1 or 2 on socio-demographic Question #4 (21% of respondents)
College grad	Respondents with a bachelor's, master's, professional, or doctoral degree (37% of respondents)
Large Household	Respondents with a household size of 5 or more people (11.5% of respondent)
Young Age	Respondents in the lowest two adult age categories, those less the age of 35 years (23% of respondents)
Tran&OrgH, H&E Shopper, Liberal	Tran Healthy, Organic healthy, Health shopper, Enviro shopper, and Liberal

Proposed transitional organic consumers have similar characteristics to those who have been found through prior studies to be common organic consumers. Typical organic produce consumers are those who are less concerned with cosmetic appearance and price and are more concerned with food safety and pesticide residues that might be on conventional produce (health factors), as well as the environmental implications of production techniques (environmental factors) (Hearne & Volcan, 2005; Schumacher, 2010). To assess the characteristics of transitional organic consumers, maximum likelihood parameter estimates for a heterogeneous preferences model for the given fruits

and vegetables in the survey were compiled, Table 4 and Table 5 provide these estimates. Conventional produce types are used as the base marginal utility and differentials in marginal utility are shown for transitional and organic options for each produce type. From this, it was found that those whose purchasing decisions are largely influenced by price (price shoppers) are significantly less likely to purchase transitional USDA organic produce or USDA organic produce. This finding is consistent across all produce options (Table 4 for fruits and Table 5 for vegetables). As expected, price shoppers are even less likely to buy organic produce than transitional produce, since the organic options, by design, have higher premiums than transitional organic options. This is reflected by the larger magnitude of the negative differential in marginal utility for organic produce. Respondents who indicated that appearance (appearance shoppers) weighs heavily in purchasing decisions also tend to be less willing to pay for transitional or organic products, although this is not consistent across all produce options.

On the other hand, respondents were more willing to purchase transitional organic produce (and organic produce) if they reported that personal health factors, coincident with food safety, were an important factor in what type of produce is bought, (Table 4 and Table 5). A strong belief that transitional organic was healthy, choosing a six or seven on the Likert-scale, also tended to increase the WTP for transitional products. Similarly, a strong belief in the healthiness of organic produce increased WTP for organic, showing a more significant relationship than that between healthiness belief in transitional and WTP premium for transitional organic. Table 6 provides the percentage of respondents that fall into these categories of transitional and organic healthiness.

Table 4. Conditional (fixed-effects) Logistic Regression, Heterogeneous Preferences for Transitional and Organic Fruit

	Fruit		
Variable	**Apples** Coefficients (585 observations)	**Grapes** Coefficients (567 observations)	**Oranges** Coefficients (588 observations)
Cost	-1.6143***	-1.1442***	-1.5200***
	(0.613)	(0.379)	(0.448)
Transitional	0.2541	0.2374	0.5581
	(0.547)	(0.419)	(0.440)
Organic	0.3714	-0.3051	0.1021
	(0.586)	(0.540)	(0.493)

	Transitional	Organic	Transitional	Organic	Transitional	Organic
Tran/Organic Healthy	0.0749	0.4202***	0.3065	0.3370	0.0311	0.4525***
	(0.140)	(0.150)	(0.255)	(0.290)	(0.133)	(0.144)
Price shopper	-0.2846*	-0.7381***	-0.7840***	-1.1808***	-0.2930**	-0.4426***
	(0.168)	(0.166)	(0.299)	(0.321)	(0.141)	(0.135)
Appearance shopper	-0.4066***	-0.3930***	-0.1716	-0.8167**	-0.2913**	-0.2985**
	(0.155)	(0.157)	(0.269)	(0.329)	(0.131)	(0.134)
Health shopper	0.3236**	0.3832**	0.4156	1.0851**	0.1042	0.3041**
	(0.160)	(0.169)	(0.285)	(0.337)	(0.140)	(0.149)
Enviro shopper	0.1681	0.4804***	0.1937	0.4018	0.0198	0.3752**
	(0.180)	(0.169)	(0.321)	(0.335)	(0.161)	(0.152)
Female	0.2018	0.1581	0.3189	0.2810	0.1017	-0.2097
	(0.149)	(0.150)	(0.267)	(0.311)	(0.132)	(0.137)
Conservatism	-0.7988***	-0.4645**	-0.8189*	-0.1595	-0.0064	-0.0658
	(0.284)	(0.200)	(0.423)	(0.420)	(0.170)	(0.178)
Liberalism	0.1296	0.3733*	0.1892	1.2234***	0.2376	0.2654
	(0.224)	(0.200)	(0.391)	(0.386)	(0.193)	(0.176)
College grad	0.0780	0.2328	-0.1975	0.4165	-0.2670	0.0269
	(0.173)	(0.159)	(0.275)	(0.285)	0(.147)	(0.135)
Log L	-145.254		-151.697		-168.002	

--Standard errors in parentheses (***significant at the 1% level, **significant at the 5% level, *significant at the 10% level).

Table 5. Conditional (fixed-effects) Logistic Regression, Heterogeneous Preferences for Transitional and Organic Vegetables

Variable	Vegetables					
	Potatoes Coefficients (585 observations)		**Lettuce** Coefficients (585 observations)		**Onions** Coefficients (579 observations)	
Cost	-1.4306***		-1.3999***		-2.4596***	
	(0.309)		(0.536)		(0.740)	
Transitional	0.1417		0.1082		-0.9608**	
	(0.473		(0.477)		(0.468)	
Organic	0.3983		0.2439		-0.3329	
	(0.720)		(0.481)		(0.555)	
	Transitional	Organic	Transitional	Organic	Transitional	Organic
Tran/Organic Healthy	0.0712	0.1609	0.7765***	0.6715**	0.5389**	0.6672**
	(0.107)	(0.126)	(0.288)	(0.263)	(0.246)	(0.289)
Price shopper	-0.2241*	-0.4274***	-0.9906***	-1.1611***	-0.1926**	-0.9938**
	(0.116)	(0.131)	(0.352)	(0.298)	(0.291)	(0.298)
Appearance shopper	-0.1870	-0.4268***	-0.8188**	-0.3288	-0.5444*	-0.5223*
	(0.109)	(0.133)	(0.335)	(0.283)	(0.277)	(0.296)
Health shopper	0.2126*	0.3366**	1.0504***	0.7719**	0.5252**	0.5811*
	(0.115)	(0.144)	(0.342)	(0.319)	(0.293)	(0.328)
Enviro shopper	0.0387	0.2606*	0.2741	0.6551**	0.6646	0.7870**
	(0.121)	(0.137)	(0.350)	(0.310)	(0.297)	(0.323)
Female	0.1609	-0.0269	-0.1911	0.1699	0.0521	0.1471
	(0.108)	(0.127)	(0.318)	(0.275)	(0.271)	(0.290)
Conservatism	-0.2145	0.3909***	-0.7183	-0.4625	-0.2346	0.0790
	(0.158)	(0.150)	(0.450)	(0.370)	(0.414)	(0.415)
Liberalism	0.3759**	0.8131***	0.0737*	0.5847	0.4138	0.8894**
	(0.153)	(0.171)	(0.436)	(0.346)	(0.360)	(0.345)
College grad	-0.1559	-0.0715	-0.3410	0.4674*	-0.0295	0.2901
	(0.121)	(0.131)	(0.347)	(0.272)	(0.282)	(0.279)
Log L	-136.012		-149.075		-144.546	

--Standard errors in parentheses (***significant at the 1% level, **significant at the 5% level, *significant at the 10% level).

Table 6. Summary Statistics of Attitudinal Questions Regarding Agricultural Production Methods, (sample *n* = 200)

Question Asked	*Q9. How much do you think organic farming practices improve the condition of the environment?*	*Q10. How healthy do you think conventional produce is?*	*Q11. How healthy do you think organic produce is?*	*Q12. How healthy do you think <u>transitional</u> produce is?*
Response	Percentage of Respondents			
0	3.0%	3.0%	2.5%	3.5%
1	4.5%	3.0%	0.0%	1.0%
2	3.5%	6.0%	0.0%	0.5%
3	5.5%	16.0%	3.0%	5.0%
4	**20.5%**	**26.5%**	14.5%	24.0%
5	**20.5%**	**22.5%**	21.5%	**33.0%**
6	16.0%	14.5%	**36.0%**	25.0%
7	**26.5%**	8.5%	22.5%	8.0%
Mean	5.093	4.412	5.621	5.016
Std. Dev.	1.660	1.463	1.086	1.122

*For question 9: [0 = no response, 1 = not at all, 7 = a lot]
For questions 10, 11, and 12: [0 = no response, 1 = not healthy, 7 = very healthy]

The effect of environmental issues influencing purchasing decisions was less conclusive, however. While for some produce options self-proclaimed environmental shoppers were more willing to pay for organics, environmental issues influencing purchasing behaviors was largely insignificant for transitional produce. This environmental influence on purchasing organic, but not transitional could potentially be due to people sticking to their habitual preferences. That is, people who are strong environmental consumers will still purchase organic produce rather than transitional produce because they have already made that commitment. Also, even if being pro-

environmental is held in high regard, it may be that the evaluation of high importance for green products is suppressed by strong habits and therefore the purchase criterion of environmental consequences becomes insignificant (Grankvist & Biel, 2001). Additionally, personal health factors dominate over environmental influences in the organics market, so a less significant effect of environmental shoppers supports previous findings.

Furthermore, research on organic WTP has found that gender, education level, and age all have a significant influence on willingness to pay a price premium for organic produce. Women have been found to be more likely than men to pay a premium, especially if they are in a household with children. Despite this, women in the present study were not statistically more likely to state a willingness to purchase either transitional USDA organic produce or USDA organic produce (Table 4 and Table 5). An explanation of this finding could be that since women have a greater marginal utility of income they are less willing to pay a premium for any products, and thus there is not a significant willingness to pay for transitional or organic produce despite attitudinal support for such (Vander Naald & Cameron, 2011).

Previous research on age interactions with organic purchases and attitudes were also not corroborated with this study. Research has shown that those over the age of 50 tend to be more concerned with pesticides, yet despite this concern households comprised of younger individuals are more likely to pay a premium for organic produce (Govindasamy & Italia, 2000). Analyses of age effects on willingness to pay for either transitional or organic products were largely insignificant. Although insignificant, those of older age tended to be less willing to pay a premium for transitional organic produce,

while those younger than 35 tend to be more willing to pay a premium for transitional organic.

Other studies have suggested that those who are college graduates are more likely to place a higher value on organic produce, as well. Results of this study show that college graduates display minimal differences in willingness to pay for transitional or organic produce (Table 4 and Table 5). For some produce options, willingness to pay a premium for transitional or organic actually decreases, while for other produce options willingness increases, therefore education tends to have an inconclusive effect on WTP for transitional produce. The insignificance of education could be explained by considering that the term organic has been around for more time now, and hence people are more aware of organic options even if less educated.

Political leanings can also be used to describe differences between consumers willing to engage in the transitional market and those who are not. On a spectrum of political ideology from extremely liberal to extremely conservative, those who identify within the top two scale points for each category are defined by liberalism or conservatism. Respondents with conservatism are overwhelmingly less likely to purchase transitional or organic produce, while liberalism has a direct relationship with WTP for transitional and organic.

Overall, these determinants have in previous studies shown to be limited by income, as those who are most willing to pay a premium for certified organic produce are higher-earning individuals or households with a higher annual income. The transitional organic market, however, seeks to provide an intermediate good between the cheaper conventional and more expensive organic options. As such, while organic premiums are

largely limited by income, transitional premiums can be set low enough to allow lower income individuals an opportunity to purchase slightly healthier food. While not significant in the model, lower income households, (those with an annual income of less than $20,000), have a positive willingness to pay for transitional organic. This supports the fact that lower income households are not excluded from the potential transitional system.

Adding in systematic heterogeneity into the specification provides a much more detailed perspective on consumer characteristics and determinants of the WTP amounts. The understanding of the constituencies that are likely to participate in the transitional organics market is important for future implementation of marketing schemes and government policies. Results suggest that health and environmentally motivated consumers with more liberal leanings are most willing to pay for transitional organic produce. Those who are more conservative, and those who are more appearance- and price-oriented are less likely to participate in the transitional market. Overall, similar to research done about organic consumption, health and environmental factors vary directly with WTP premium for transitional organic produce, while price and appearance factors vary indirectly.

The implications of parameter estimates for the preferred parsimonious model with heterogeneous preferences are conveyed as quantitative WTP premia in Tables 7 and 8. These tables provide per-unit WTP premium values for transitional organic produce of all six produce types. The calculated values are based on assumed normal distributions of calculated derivatives reported from 1,000 random draws from the maximum likelihood parameter estimates for the specification. Table 7 provides the

median WTP premium value over conventional produce, while Table 8 shows mean WTP premium. As seen from the median WTP premium, the base case, or average male respondent without any of the defining characteristics, is not willing to pay a premium for any of the transitional produce options. However, the mean WTP premium values, with negative estimates stacked at zero, show that there is a significant WTP premium for transitional organic produce varied by produce type. In particular, respondents in the base case were willing to pay more for transitional lettuce, onions, oranges, and apples and a positive, but small WTP for transitional grapes and potatoes (Table 8).

This phenomenon of differences in WTP across produce types is consistent regardless of the different categories of respondents modeled. These WTP premium differences may by accounted for by variability in growing and consumption methods of the produce types, and the subsequent perceived risk of chemical exposure. For instance, respondents may be less willing to pay a premium for transitional potatoes since potatoes are grown underground and consumers may think that this decreases chemical exposure, (although the opposite is true). Similarly, respondents may be willing to pay less for transitional oranges since there is a thick peel that is not consumed, acting as a shield to chemicals. Also, respondents may be unlikely to pay a large premium for transitional grapes since grapes are typically a more expensive produce option, and thus paying a premium on top of that is unlikely. Despite these differences in WTP premium, there is an overall positive premium value for transitional organic produce, especially when the respondent population is broken down into subpopulations.

Much like expressed by the conditional logit estimates, transitional organic consumers are willing to pay a higher premium than those who are price and appearance

shoppers. Respondents were more willing to purchase transitional organic produce if they reported that personal health factors and environmental factors were important in deciding what produce is bought. Willingness to pay premium for respondents who are health and environmental shoppers is much higher than the base case WTP premium. On the other hand, price and appearance shoppers are not willing to pay a premium for any transitional produce options. Furthermore, respondents with conservatism show a low or negligible WTP premium for transitional or organic produce, while liberalism has a positive impact on WTP premium for such produce. Those who think that transitional and organic produce is healthy also show a higher WTP premium value for transitional organic produce.

The intermediate-good nature of the potential transitional organic market provides a more accessible option for a diverse population. While premiums for organic produce are largely set too high, transitional premiums allow those who are less typically organic consumers to purchase healthier food. This is seen through the finding that respondent WTP premium for organic produce was less prolific than WTP premium for transitional, (mean WTP premium for organic is depicted in Table 9). Younger respondents, females, and respondents with larger households are not excluded from the transitional market, whereas these respondents are less willing to engage in the organic market. This suggests that transitional organic options can provide a significant market influence.

Table 7. Derivatives of Marginal WTP Premium for Transitional Organic Produce, (Median)

Produce	With respect to:						
	Base	**Organic Healthy**	**Tran Healthy, Organic Healthy**	**Price shopper**	**Appearance shopper**	**Health shopper**	**Enviro shopper**
Apples	$0.00	$0.00	$0.34	-	-	$1.44	$0.68
	($0.00, $1.11)	($0.00, $1.11)	($0.00, $1.87)	-	-	($0.00, $3.36)	($0.00, $2.53)
Grapes	$0.00	$0.00	$0.00	-	-	$0.89	$0.00
	($0.00, $0.32)	($0.00, $0.32)	($0.00, $2.03)	-	-	($0.00, $0.40)	($0.00, $2.67)
Oranges	$0.00	$0.00	$0.00	-	-	$0.54	$0.21
	($0.00, $0.93)	($0.00, $0.93)	($0.00, $1.08)	-	-	($0.00, $2.14)	($0.00, $1.82)
Potatoes	-	-	$0.00	-	-	$0.01	$0.00
	-	-	($0.00, $0.44)	-	-	($0.00, $1.10)	($0.00, $0.66)
Lettuce	$0.00	$0.00	$2.34	-	-	$4.70	$1.20
	($0.00, $1.94)	($0.00, $1.94)	($0.00, $5.84)	-	-	($1.63, $8.74)	($0.00, $4.80)
Onions	$0.00	$0.00	$1.98	-	-	$2.18	$2.07
	($0.00, $1.73)	($0.00, $1.73)	($0.00, $4.76)	-	-	($0.00, $5.57)	($0.00, $5.33)
	Female	**Conservatism**	**Liberalism**	**College grad**	**Large Household**	**Young Age**	**Tran&OrgH, H&E Shopper, Liberal**
Apples	$1.01	-	$0.43	$0.41	$1.78	$0.00	$2.87
	($0.00, $2.73)	-	($0.00, $2.48)	($0.00, $2.06)	($0.00, $4.60)	($0.00, $1.55)	($0.69, $5.99)
Grapes	$0.00	-	$0.00	-	$2.54	$2.53	$4.08
	($0.00, $2.42)	-	($0.00, $2.96)	-	($0.00, $7.04)	($0.00, $5.85)	($0.00, $9.40)
Oranges	$0.20	$0.08	$1.08	$0.00	$0.32	$0.74	$2.01
	($0.00, $1.60)	($0.00, $1.78)	($0.00, $3.19)	($0.00, $0.07)	($0.00, $2.33)	($0.00, $2.41)	($0.12, $4.54)
Potatoes	$0.00	-	$0.86	-	$0.00	$0.00	$2.32
	($0.00, $0.75)	-	($0.00, $2.35)	-	($0.00, $0.08)	($0.00, $0.28)	($0.80, $4.48)
Lettuce	$0.00	-	$0.79	$0.00	$0.00	$0.00	$9.77
	($0.00, $1.51)	-	($0.00, $4.84)	($0.00, $0.42)	($0.00, $2.44)	($0.00, $2.84)	($5.45, $17.49)
Onions	$0.00	$0.00	$2.30	$0.00	$1.30	-	$9.34
	($0.00, $1.74)	($0.00, $1.17)	($0.00, $6.59)	($0.00, $.81)	($0.00, $5.22)	-	($4.82, $16.85)

*Medians, 5th, and 95th percentiles of the distribution of calculated derivatives are reported based on 1,000 random draws from the maximum likelihood estimates for the full specification. Dashes represent all zero values for the median, 5th, and 95th percentile. Intervals reflect parameter estimate precision.

Table 8. Derivatives of Marginal WTP Premium for Transitional Organic Produce, (Mean)

Produce	With respect to:						
	Base	**Organic Healthy**	**Tran Healthy, Organic Healthy**	**Price shopper**	**Appearance shopper**	**Health shopper**	**Enviro shopper**
Apples	$0.27	$0.27	$0.57	-	-	$1.52	$0.85
Grapes	$0.05	$0.05	$0.39	-	-	$1.27	$0.55
Oranges	$0.19	$0.19	$0.22	-	-	$0.71	$0.51
Potatoes	$0.01	$0.01	$0.06	-	-	$0.27	$0.10
Lettuce	$0.40	$0.40	$2.58	-	-	$4.91	$1.61
Onions	$0.37	$0.37	$2.12	-	-	$2.40	$2.23
	Female	**Conservatism**	**Liberalism**	**College grad**	**Large Household**	**Young Age**	**Tran&OrgH, H&E Shopper, Liberal**
Apples	$1.11	-	$0.74	$0.65	$1.99	$0.37	$3.10
Grapes	$0.57	-	$0.60	-	$2.85	$2.63	$4.37
Oranges	$0.44	$0.44	$1.23	$0.02	$0.67	$0.87	$2.13
Potatoes	$0.12	-	$0.98	-	$0.02	$0.03	$2.46
Lettuce	$0.23	-	$1.43	$0.06	$0.41	$0.64	$10.51
Onions	$0.30	$0.14	$2.62	$0.10	$1.74	-	$9.87

* Means of the distribution of calculated derivatives are reported based on 1,000 random draws from the assumed normally distributed maximum likelihood estimates for the full specification. Negative estimates are stacked at zero.

Table 9. Derivatives of Marginal WTP Premium for USDA Organic Produce, (Mean)

Produce	With respect to:						
	Base	**Organic Healthy**	**Tran Healthy, Organic Healthy**	**Price shopper**	**Appearance shopper**	**Health shopper**	**Enviro shopper**
Apples	$0.13	$1.60	$1.60	-	-	$1.73	$2.36
Grapes	$0.04	$0.33	$0.33	-	-	$3.62	$0.81
Oranges	$0.24	$2.01	$2.01	-	-	$1.82	$2.02
Potatoes	-	$0.02	$0.02	-	-	$0.34	$0.27
Lettuce	-	$0.25	$0.25	-	-	$1.51	$2.19
Onions	$0.01	$0.57	$0.57	-	-	$2.31	$1.99
	Female	**Conservatism**	**Liberalism**	**College grad**	**Large Household**	**Young Age**	**Tran&OrgH, H&E Shopper, Liberal**
Apples	$0.58	-	$1.51	$0.97	$1.04	$0.09	$8.34
Grapes	$0.21	-	$3.57	$0.23	$0.70	$0.76	$12.85
Oranges	$0.01	$0.20	$1.60	$0.27	$0.01	$0.26	$7.38
Potatoes	-	$0.10	$2.02	-	-	-	$6.32
Lettuce	$0.05	-	$0.64	$0.22	-	$0.10	$13.00
Onions	$0.10	-	$1.96	$0.06	-	-	$13.83

*Means of the distribution of calculated derivatives are reported based on 1,000 random draws from the assumed normally distributed maximum likelihood estimates for the full specification. Negative estimates are stacked at zero.

Suggestions for Subsidies and Advocacy

Environmentally conscious consumers tend to prefer a subsidy system or promotion of green goods via a tax when compared to price-oriented consumers, who are less likely to support a tax on dirty goods and who would not necessarily support a subsidy for clean goods (Schumacher, 2010). Overall, however, consumers tend to prefer subsidies on ecolabelled goods, as opposed to taxes on dirty goods. One policy option to undertake might be to establish a subsidy on organic products. This would not be an ideal scenario, though.

A generalized subsidy on the price of organic products can lead to an increase in consumption of such goods due to a cheaper price; however, this decision may also have an inconclusive effect on the production of dirty goods or conventionally produced goods. Instead, a subsidy on the transition process to organics would potentially encourage more farmers to participate in the system and thereby convert conventional farmers into more sustainable organic farms. In turn, with an increase in production, the price of organic produce can be driven down without the direct subsidy on organic prices at the onset, which may only benefit large corporate organic farms rather than all farmers who may wish to convert to organic agriculture.

To gauge the potential support for a subsidy provided to farmers during transition, direct survey questions were asked about consumer attitudes with regard to helping farmers. Respondents were asked if they thought subsidies should be provided to farmers to help them convert to organic production, and 42% stated that yes, subsidies should be offered (Table 10). An additional 25.5% of respondents stated that they were unsure, potentially due to the lack of information about how the subsidy would work and

other concerns. For those individuals who are unsure about their support for such a transitional subsidy, providing information about the benefits of the system through advocacy work might help gather support for the subsidy.

Farmer support was also gauged through addressing a market-driven form of support. For this, respondents were asked if they were willing to pay a premium for transitional organic produce if they knew it would help farmers in the process of converting to organic agriculture. While the choice scenarios also attempted to answer this question of WTP for transitional organic produce, here additional information was provided in that it would help farmers convert to an organic system, which was not explicitly obvious through the background statement provided for the choice scenarios. Nearly 30% of respondents stated that they would be willing to pay a premium, while 40% were not sure (Table 10). This mere 30% is arguably a large portion of consumers for which a transitional organics market could target. Furthermore, the large percentage of uncertain responses could be due to the fact that transitional organics is still a hypothetical system. Perhaps if consumers were provided with more information and became more familiar with the term they would be more willing to participate, as well.

Table 10. Summary Statistics of Direct Attitudinal Questions Regarding Transitional Organics, (sample *n* = 200)

	Response	Percent
Q.19 Willing to pay premium for transitional organic produce to help farmers convert to organic?*	Yes	29.5%
	No	29.0%
	Not Sure	40.0%
	No response	1.5%
Q.20 Should government subsidies be provided to farmers to help them convert to organics?*	Yes	42.0%
	No	31.0%
	Not Sure	25.5%
	No response	1.5%

*Questions presented here are truncated. Please see Appendix A for complete survey questions.

Caveats and Future Research Suggestions

One of the biggest caveats of using stated preference techniques is being able to assess the validity of the measurement. Typically, stated preference is used when no markets currently exist or there are no revealed preferences available to directly observe behavior in the marketplace; this means that no comparison between the elicited preferences and actual purchasing behavior can be undertaken (Brown, 2003). To make sure these preferences match behaviors in real-market settings, respondents were prompted to make choices as realistically as possible. Additionally, half of the respondents were told that their choices could have consequences in that information from the survey could be made available to policy-makers. There were no significant differences between the first set and second set of surveys in which the consequentiality was presented differently (Table 11), therefore the first set of surveys without explicit consequentiality are still significant for analysis.

Another limitation with the hypothetical nature of stated preference surveys is that the psychological issue of the attitude-behavior gap. This known gap further exacerbates problems with determining actual market behavior. To minimize this effect, questions also addressed measures of consumer confidence in their decisions and how realistic they believed the prices and quantities presented in the choice scenarios reflected real values. Nearly 50% of respondents were strongly confident in their similar future behavior and the modal distribution representing "realistic" for price and quantity suggest that values provided were what consumer would anticipate in the real market (Table 12). Despite these results, there is no certainty in knowing how consumers will actually behave in the transitional market. One of the biggest hurdles in establishing a change in behavior towards a more sustainable consumer is habit formation; so introducing a new market type of produce – transitional – may be unsuccessful initially until consumers become more aware of its attributes and benefits.

Table 11. Differences in Survey Versions With and Without Consequentiality, (sample *n* = 200)

Produce Type	Survey Version	Coefficient	Standard Error	Chi-Squared
Apples	Transitional Set 1	0.2373	0.2709	Insignificant
	Transitional Set 2	0.2668	0.2592	
	Organic Set 1	0.6169	0.2583	Insignificant
	Organic Set 2	0.6830	0.2581	
Grapes	Transitional Set 1	0.7030	0.3908	Insignificant
	Transitional Set 2	0.4341	0.4053	
	Organic Set 1	1.5642	0.4424	Insignificant
	Organic Set 2	1.5191	0.4334	
Oranges	Transitional Set 1	-0.2588	0.2458	Insignificant
	Transitional Set 2	-0.2741	0.2480	
	Organic Set 1	-0.0786	0.2369	Insignificant
	Organic Set 2	-0.1680	0.2426	
Potatoes	Transitional Set 1	0.1983	0.2508	Insignificant
	Transitional Set 2	0.0969	0.2474	
	Organic Set 1	-0.0146	0.2646	Insignificant
	Organic Set 2	0.0430	0.2668	
Lettuce	Transitional Set 1	0.2092	0.4461	Insignificant
	Transitional Set 2	0.3830	0.4379	
	Organic Set 1	0.9389	0.4709	Insignificant
	Organic Set 2	1.0583	0.4656	
Onions	Transitional Set 1	0.2197	0.4156	Insignificant
	Transitional Set 2	0.4316	0.4341	
	Organic Set 1	0.5021	0.4996	Insignificant
	Organic Set 2	0.4686	0.4784	

Table 12. Summary Statistics of Control Questions, (sample *n* = 200)

Question asked	*Q.1 How realistic were the prices asked of?*	*Q.2 How realistic were the amounts of produce asked of?*	*Q.4 How confident are respondents in their choices?*
Response	Percentage of Respondents		
0	4.5%	4.5%	2.0%
1	2.5%	0.0%	0.5%
2	4.0%	3.0%	1.0%
3	9.5%	7.0%	2.5%
4	63.0%	63.0%	8.0%
5	12.0%	10.5%	13.5%
6	3.5%	7.0%	26.0%
7	1.0%	5.0%	46.5%
Mean	3.970	4.277	5.910
Std. Dev.	0.932	0.998	1.464

*Questions presented here are truncated. Please see Appendix A for complete survey questions.
For questions 1 and 2: [0 = no response, 1 = low, 4= realistic, 7 = high]
For question 4: [0 = no response, 1 = not confident, 7 = very confident]

Another caveat of this study is that the generalizability is limited due to the sampling population residing in Lane County, Oregon. While the socio-demographics of the sample in terms of racial distribution align with that of the county and state, the sample contains significantly less racial diversity when compared to the population of the United States as a whole. The small representation of races other than "White" precludes analysis of how different racial and ethnic communities respond to transitional organic options. Additionally, the survey sample in general represented a larger percentage of individuals with slightly higher household income and who are more educated than the

general population at the county, state, and national levels. And, according to Gallup polls collected in 2011, 40% of national adults stated that they were with very conservative or conservative (Gallup Inc., 2013), a much larger percentage than the 24% of respondents in this study who claimed the same. Likewise, the percentage of respondents in this study who identified as very liberal or liberal was 33%, while national averages are closer to 21% (Gallup Inc., 2013). (See Table 13 for this demographic breakdown). Therefore, future research can extend the reach of the survey outside of Oregon to capture results more representative of the nation of the whole. (For complete descriptive statistics of the survey sample socio-demographic distributions see Table 14.)

Table 13. Political Ideology of the Sample and the Nation

	Percentage of Respondents	
	Sample Population (*n = 200*)	Gallup Poll 2011 (*n = 20,392*)
Very Conservative	7.5%	10%
Conservative	16.5%	30%
Moderate	39%	35%
Liberal	24%	15%
Very Liberal	9%	6%
No response	4%	4%

Table 14. Descriptive Statistics of Survey Sample and Actual Population Socio-Demographics

	Survey Sample	Lane County	Oregon	United States
2011 Total population estimate		352,047	3,839,598	309,231,244
Sample size	200			
Male	49.5%	49.2%	49.5%	49.2%
Female	49.0%	50.8%	50.5%	50.8%
Age Distribution (age 20 and above)				
20 to 24 years	6.2%	12.2%	8.9%	9.6%
25 to 34 years	14.4	16.7	18.3	18.2
35 to 44 years	20.5	15.2	17.5	18.2
45 to 54 years	20.5	17.6	18.7	19.8
55 to 59 years	16.4	9.9	9.5	8.8
60 to 64 years	12.3	8.6	8.4	7.5
65 to 74 years	7.7	10.6	10.1	9.7
75 to 84 years	0.0	6.4	5.9	5.7
85 years and over	0.0	2.7	2.7	2.5
Racial and Ethnic Distribution				
White	93.0%	93.1%	88.2%	76.4%
Black or African American	0.5	1.8	2.6	13.6
American Indian and Alaska Native	4.5	3.0	2.8	1.6
Asian	2.0	3.7	4.9	5.6
Native Hawaiian and Other Pacific Islander	0.0	0.5	0.7	0.4
Some other race	0.5	2.4	4.7	5.3
Hispanic or Latino (of any race)	3.5	7.4	11.8	16.4
Household income distribution				
Less than $10,000	4.9%	10.1%	7.5%	7.40%
$10,000 to $14,999	3.8	6.8	5.7	5.6
$15,000 to $24,999	8.2	13.5	11.7	11.0
$25,000 to $34,999	9.9	12.5	11.5	10.6
$35,000 to $49,999	14.3	15.1	15.0	13.9
$50,000 to $74,999	24.0	18.7	19.2	18.3
$75,000 to $99,999	13.9	10.4	12.1	12.0
$100,000 to $149,999	13.7	8.4	11.0	12.3
$150,000 to $199,999	4.4	2.3	3.5	4.5
$200,000 or more	2.7	2.1	2.9	4.3
Education, persons 25 and older				
Less than high school	3.4%	9.6%	10.9%	14.4%
High school graduate	12.3	24.8	24.7	28.4
Some college, no degree	31.8	30.2	27.2	21.3
Associate's degree	12.3	8.3	8.1	7.6
Bachelor's degree	22.4	16.7	18.5	17.7
Graduate or professional degree	17.9	10.5	10.6	10.5

*Source: U.S. Census Bureau, 2009-2011 American Community Survey

CHAPTER V

CONCLUSION

"Agripower is...an even greater force than petropower in man's survival in the future. Man can and has survived without petroleum, but he cannot live without food" (Berry, 1977, p. 35). While it is true that human survival is dependent on food and not on oil, the two resources are so closely intertwined in the United States that the majority of modern food consumption cannot be sustained without petroleum. Modern agriculture has become just that – “the art of turning oil into food" (Foster, Clark, & York, 2010, p.81). Agricultural technology continues to concentrate food production in the hands of fewer and fewer agribusinesses, and in return society becomes more and more reliant on fossil fuels to encourage mass production. Although agribusiness may increase the quantity of food, the quality diminishes and the sustainability for future generations to use the land for their own food needs decreases greatly. Instead of desiring a reversal of this action, U.S. government subsides reinforce this large-scale production that causes degradation of land and reduced food independence. Alternatively, a progression toward more organic forms of agriculture can pave a new road for food production that at the onset may not dismantle the agribusiness force, but may allow for a gradual shift toward more sustainable food systems.

In the United States, the increased demand for products of consumption between merchants and household farms degraded the historical relationship between people and land -- it has inevitably led us to where we are today, in a society that values exploitation, simplicity, and ever more production in place of standards, land, and health (Berry, 1977). The continual distancing of consumption and production of food perpetuates a

cycle wherein a diminished value is placed on plant and food diversity foods, which are important for ecosystem health. Furthermore, increased demand for cheaper and cheaper food for the sake of having more money for other material items forces production down a path of lowest cost and ignorance of environmental consequences. In effect, the American culture has lost its connection to the land by valuing materialistic items and money more than community, family, and nature – the agricultural crisis is a crisis of culture.

The production of food today, to account for a growing population worldwide, has turned from a once sustainable system of subsistence to a globalized food system with industrial large-scale agricultural operations that distance the consumer from the product they are consuming. To make matters worse, for the sake of consumer convenience in an affluent industrial or post-industrial society, there is no time or desire to trace food to its origin. Consumers therefore look to certification labeling to make more informed food decisions. In providing additional information, such as organic labels, individuals might partially gain back a relationship with the food they consume and the land that produces that food.

The intensification of capital for food production has lead to great destruction of the natural system; however, if a sustainable agricultural model is used where the natural environment and social costs are considered in the total costs, then a more accurate depiction of prices will ensue and externalities may be better accounted for. For one, the current subsidy programs in the United States should be reevaluated. Subsidies on oil and corn make it so that consumers are no longer able to make the socially optimal decision since prices no longer reflect 1) the scarcity of inputs and 2) the true cost of production. Instead, the government might see environmental improvements by subsidizing

transitions to organic agriculture, to local food, and to community based food systems that are more sustainable, healthy, and productive. By doing so, the artificially lowered conventional prices would reflect the true cost of the products via a shift to increased prices, while prices for organic produce would be lowered to reflect positive externalities of the system. This change, however, assumes that organic labels are properly enforced and that the current partially capitalistic framework is sufficient in handling society's needs.

Many argue, however, that Western capitalistic societies' market-oriented paradigm for environmental change – positioning consumers as the key to promoting sustainability through a large emphasis on the role individuals in consumption and citizenship – diminishes the power of other approaches to reach sustainability (Barr, Gilg & Shaw, 2011; Dobson, 2010). Furthermore, it is suggested that environmental problems are a result of a cultural paradigm of expansion that can only be fixed with a change in society's most basic beliefs and premises. While one cannot deny the validity this suggestion – that society itself and market-based approaches could change in order to achieve a more sustainable future – this is a very difficult process. Radical change, or an ecological revolution, is an ambitious goal in a diversely populated democratic society, where changing peoples' behaviors and values, which are habitually and culturally ingrained, is unlikely to happen.[26]

Given the current worldwide state of our environment, with the potentially devastating effects of climate change already coming becoming a reality, as well as the

[26] This is not to say, however, that in the long-run radical change is not important, but rather that for the sake of time, maybe a focus on grounded solutions that do not jolt people out of their comfort zones of historical capitalism is more efficient. This process can potentially work as a continually evolving activity to bring about a large-scale revolutionary change in the way we value nature, how we define our community, and how we understand what is good for the self and society.

West's economic and cultural obsession with growth via consumerism, there is a dire need for a greater understanding of how these two influences – the environment and consumerism – can be used together, at least in the short run, as opposed to working as contradictory forces of Western society's current existence. Although the focus on citizen-consumers is potentially not the long-term solution, it may be effective in the short run. Rather than thinking of curtailment behaviors, more effective measures of change in terms of having a high-impact and less requirement of resources and time come from efficiency measures (Clayton & Myers, 2009). If we face the reality of our capitalistic society and mass culture, then we need to pay attention to consumerism and try to determine how to influence behavioral choices (e.g. how to do things in a different and less environmentally harmful way, as in purchasing more sustainable products). This is especially true in the food market, as when assessing food consumption one cannot focus on curtailment factors because food demand is not elastic – people are not going to eat significantly more because food is cheap. This suggests that rather than relying on a radical change, a more practical scenario for future change manipulates the current system to produce beneficial outcomes.

Since individual identities are intricately woven through consumption of goods and services on a continual basis, using green consumerism to shape sustainable identities can direct society toward sustainability goals (Hurth, 2010; Soron, 2010). In economics, it is well known that we live in world of finite and scarce resources amidst unlimited wants and desires. Hence, there is a necessity for environmental protection, which is often left in the hands of individuals who make trade-offs between the protection of the environment and other economic or choice values, such as convenience and time. This interaction of environmental consciousness and consumer culture play out through the

green market, which in this case is generalized to include organic and transitional organic agricultural production methods and products.

Maintaining a high output of agricultural products while increasing the viability of the system in the long run is an efficiency measure that takes into account intergenerational resources and consequences without drastically changing the system. Large majorities of people worldwide have a fair to high level of concern about the environment, even to the extent that over half of respondents of one survey agreed that protection of the environment should be given greater priority over the creation of jobs and economic growth (Leiserowitz et al., 2006). However, 91% of respondents also reported in another survey regarding economic values and attitudes that it is at least somewhat important to live in a country with economic prosperity. With a move to organic agricultural production, both the values of protecting the environment and of maintaining economic stability are addressed. Thus, providing support for farmers to transition to an organic system may aid in protecting our environment and contribute to a larger goal of sustainability. Such programs may also improve human health conditions. This action may, in effect, make sustainable products more readily available and attainable for the larger American population so that a shift in consumption behavior might occur without changing people themselves.[27] For this to happen, farmers need to know whether people are willing to support them during a transition to organic production that many perceive as risky.

Farmers are often dissuaded from participating in the organic system because of the long certification process and the prohibited use of synthetic substances for at least

[27] This is one of the underlying premises of environmental economics. Rather than changing attitudes and behaviors, a focus should be on changing constraints that dictate behavior, such as changing prices to make certain products cheaper and increasing utility of desirable choices.

three years prior to organic production. During this time, with large costs of transition and a steep learning curve, economic competitiveness with conventional products is weak since no price premium is established. However, if there exists a market for products labeled as transitional organic, with a price premium closer to that of regular organic products, then there is the possibility that more farmers would be willing to make the transition, especially with help from government subsidies. Findings from this survey suggest that benefits are higher than expected during the transition to an organic system by way of consumer WTP for transitional organic produce and the availability of a market for transitional organic products. This research also suggests that government policy should be set in place to subsidize the transition process to an organic system in order to further support farmers wishing to engage in more sustainable agricultural methods. The combination of market-driven and government-driven approaches to sustainable production helps mitigate single effects of farmers who hold anti-subsidy attitudes.

Organic farming conversions can be advantageous to helping achieve sustainability goals through conservation of water, energy, soil, and biological resources. Organic agriculture techniques allow for higher soil organic matter and natural nitrogen that in turn result in productive land not only now, but maintain productive capacity for the future, as well. Compared to conventional systems, organics require lower fossil fuel energy inputs (Pimentel et al., 2005).[28] This added benefit of less energy inputs, (particularly those derived from fossil fuels), not only conserves valuable exhaustible resources, it also decreases pollution brought about through the process of fossil fuel

[28] A 22-year study conducted by the Rodale Institute found that organic systems required nearly a third less energy that conventional systems.

extraction and burning, slowing global climate change. Organic farming also works to conserve soil moisture through natural cycles of nutrient and soil microbiological activities. Increased soil moisture in turn reduces water resources needed for plant growth. Considering that fresh water resources are increasingly in short supply and high demand, organic agriculture achieves sustainability goals of allowing a more equitable allocation of water – a necessity of life. Furthermore, increased soil organic matter and biodiversity as a result of ecologically sound organic techniques provide a more balanced ecosystem and sustained food security for future generations.

Providing support during the conventional-organic transition can potentially allow organic agriculture to become a more prevalent system in the United States. When the production of food produced sustainably increases, prices of sustainable products tend to decrease, thus giving more individuals access to healthier produce. This achieves multiple goals of environmental protection, human health benefits, food justice, and environmental justice. Farmer workers, who are often of the minority population, are in turn exposed to fewer harsh chemicals. Organic food means "…organic producers are exposing farmworkers, neighbors, and eaters to far less toxicity than their conventional counterparts are" (Guthman, 2000, p.22). An increase in organic production can also result in a shift toward more sustainable behaviors over time.

People who take one step in a sustainable direction may proceed further along the same path. In fact, research on the foot-in-the-door effect suggests that even a small action may lead to further actions for the same cause, due to self-perception, conformity, consistency, and commitment. While curtailment of general consumption is arguably a necessity for long-term sustainability goals, the suggestion here is to focus on efficiency measures in food consumption as a start to generate sustainable identities. This would

require an increased availability of sustainable products. An environmental identity, potentially spurred by consumption of organic products as a consumer or production of organic goods as a farmer, could thereby encourage a sense of oneself as a member of a collective. Such a collective identity tends to encourage more group-oriented behavior, and group-oriented behavior can encourage more sustainable collective behavior, whereupon curtailment and sustainability goals would be more attainable (Verbeke et al., 2007; Tukker, 2006).

APPENDIX A

FOOD CHOICES SURVEY

Informed Consent Agreement

This research study examines the dynamics of consumer choices. Marissa Williams, a graduate student at the University of Oregon, will conduct the study.

Should you choose to participate, you will be asked to express your preferences for a series of market choices and answer some additional survey questions. One type of question uses rating scales in which you will rate survey items with respect to how much each statement reflects your opinions. Although your answers to each question will be helpful to our analysis, you may leave any question blank if you feel uncomfortable about answering it, and you may stop the survey at any time without penalty.

This is a "minimal risk" study, where you will be exposed to risks that are no greater than those encountered in daily life. Some participants may find immediate benefits in the form of increased knowledge. All participants will be helping further our collective understanding of consumer decision-making.

This is an anonymous study in which no personal identifying information will be collected.

If you have any questions, you can contact researcher Marissa Williams at (559) 906-4054 or at mwilli10@uoregon.edu.

If you would like, a copy of this consent statement will be given to you for your records.

YOUR DECISION TO PARTICIPATE IS VOLUNTARY. COMPLETING AND RETURNING THIS QUESTIONNAIRE MEANS YOU HAVE GIVEN CONSENT TO PARTICIPATE.

University of Oregon Research Compliance Services Protocol # 10162012.02

PLEASE READ THIS BEFORE CONTINUING

This section provides *background information* for the survey:

In this survey you will see the term **transitional organic.** Here is what this term means:

> When a farm is trying to become a USDA certified organic producer, it is required to wait three years to allow the soil to refresh without the use of certain chemicals. After at least one year, crops produced are somewhere between conventional and USDA certified organic, something which the industry refers to as "transitional organic."

***Instructions**:*

You will be asked to consider product choices like those you might actually face when you shop for food. These choices concern conventional, USDA transitional organic, and USDA organic fruits and vegetables. **There are no right or wrong answers to these questions.**

Please consider each of the following six choice scenarios separately. Assume that each scenario concerns a typical shopping trip, where you have only the usual amount of time to compare products. For each case, indicate which choice you would most likely make – **be as realistic as possible about your shopping choices**. Consider all factors, such as expected differences between food options (e.g. appearance, size, freshness, taste, etc.), your food budget, and the preferences of any other people for whom you would normally buy food.

In surveys like this, with hypothetical shopping questions, people sometimes choose the products that they would *like* to buy, if money were no object. Or, they pick the product that they think the research team would like them to choose. Please be sure that you **would actually be willing and able to pay** for the products you choose. If you simply prefer or need to spend your money on other things, it is reasonable to decide against a product that is too expensive.

The results of this survey will be made available to policy-makers who have the authority to affect the availability and prices of certain food options, so your choices in this survey could have **real consequences** for you and other consumers.

> ** If every product in a choice set seems too expensive, choose "None" **

(Note: If *someone else* in your household normally shops for food, please answer the choice questions on behalf of that person to the best of your ability. If you live in a college dorm or other institutional setting please answer as if you were currently shopping for yourself.)

Choice Scenario #1 (Red Grapes)

Suppose you have come to your usual food store. Your shopping list includes **one pound** of red grapes. The store currently offers three types of red grapes that are labeled as "Conventional," "Transitional USDA Organic," or "USDA Organic." The prices are also different.

Keeping in mind your household budget and other preferences, which would you buy? (**Check ONE**)

	A	**B**	**C**	**None**
Type	Conventional Grapes	Transitional USDA Organic Grapes	USDA Organic Grapes	
Price	$ 2.62 /lb	$ 2.96 /lb	$ 3.07 /lb	
Total Cost	$ 2.62 for 1 lb	$ 2.96 for 1 lb	$ 3.07 for 1 lb	
I prefer:	❍$_1$	❍$_2$	❍$_3$	❍$_4$

Choice Scenario #2 (Russet Potatoes)

Suppose you have come to your usual food store. Your shopping list includes **four pounds** of russet potatoes. Again, the store currently offers three types of russet potatoes that are labeled as "Conventional," "Transitional USDA Organic," or "USDA Organic." The prices are also different.

Keeping in mind your household budget and other preferences, which would you buy? (**Check ONE**)

	A	**B**	**C**	**None**
Type	Conventional Potatoes	Transitional USDA Organic Potatoes	USDA Organic Potatoes	
Price	$ 0.43 /lb	$ 0.88 /lb	$ 0.93 /lb	
Total Cost	$ 1.72 for 4 lbs	$ 3.52 for 4 lbs	$ 3.72 for 4 lbs	
I prefer:	❍$_1$	❍$_2$	❍$_3$	❍$_4$

Choice Scenario #3 (Romaine Lettuce)

As before, suppose you have come to your usual food store to buy **two heads** of romaine lettuce.

Keeping in mind your household budget and other preferences, which would you buy? (**Check ONE**)

	A	**B**	**C**	**None**
Type	Conventional Lettuce	Transitional USDA Organic Lettuce	USDA Organic Lettuce	
Price	$ 1.14 each	$ 1.64 each	$ 1.64 each	
Total Cost	$ 2.28 for 2 heads	$ 3.28 for 2 heads	$ 3.28 for 2 heads	
I prefer:	❍$_1$	❍$_2$	❍$_3$	❍$_4$

Choice Scenario #4 (Fuji Apples)

Suppose you have come to your usual food store to buy **three pounds** of Fuji apples.

Keeping in mind your household budget and other preferences, which would you buy? (**Check ONE**)

	A	**B**	**C**	**None**
Type	Conventional Apples	Transitional USDA Organic Apples	USDA Organic Apples	
Price	$ 0.87 /lb	$ 0.87 /lb	$ 1.17 /lb	
Total Cost	$ 2.61 for 3 lbs	$ 2.61 for 3 lbs	$ 3.51 for 3 lbs	
I prefer:	❍$_1$	❍$_2$	❍$_3$	❍$_4$

Choice Scenario #5 (Yellow Onions)

Suppose you have come to your usual food store to buy **two pounds** of yellow onions.

Keeping in mind your household budget and other preferences, which would you buy? (**Check ONE**)

	A	**B**	**C**	**None**
Type	Conventional Onions	Transitional USDA Organic Onions	USDA Organic Onions	
Price	$ 0.47 /lb	$ 0.60 /lb	$ 0.97 /lb	
Total Cost	$ 0.94 for 2 lbs	$ 1.20 for 2 lbs	$ 1.94 for 2 lbs	
I prefer:	❍$_1$	❍$_2$	❍$_3$	❍$_4$

Choice Scenario #6 (Oranges)

Suppose you have come to your usual food store to buy **three pounds** of oranges.

Keeping in mind your household budget and other preferences, which would you buy? (**Check ONE**)

	A	**B**	**C**	**None**
Type	Conventional Oranges	Transitional USDA Organic Oranges	USDA Organic Oranges	
Price	$ 1.05 /lb	$ 1.10 /lb	$ 1.16 /lb	
Total Cost	$ 3.15 for 3 lbs	$ 3.30 for 3 lbs	$ 3.48 for 3 lbs	
I prefer:	❍$_1$	❍$_2$	❍$_3$	❍$_4$

Questions Related To Your Choices

Please mark only one answer to each question. Remember there are *no* wrong answers.

1. On average, how realistic were the different prices you were asked to consider?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Too low			Realistic			Too high

2. On average, how realistic were the different amounts of produce you were asked to consider?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Too low			Realistic			Too high

3. Are you aware of the standards for USDA organic certification?

1❑ Yes
2❑ No
3❑ Not Sure

4. How confident are you that, when you shop, you would make the same choices you indicated in the choice scenarios on the previous pages?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not confident						Very Confident

5. To what extent does the price of the produce generally influence your purchasing decisions?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not at all						A lot

6. To what extent do environmental factors generally influence your purchasing decisions?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not at all						A lot

7. To what extent does the appearance of the produce influence your purchasing decisions?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not at all						A lot

8. To what extent do health factors influence your purchasing decisions?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not at all						A lot

9. How much do you think organic farming practices improve the condition of the environment?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not at all						A lot

10. How healthy do you think conventional produce is?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not healthy						Very healthy

11. How healthy do you think USDA organic produce is?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not healthy						Very healthy

12. How healthy do you think USDA <u>transitional</u> organic produce is?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not healthy						Very healthy

13. Have you noticed transitional organic options available in grocery stores where you shop?

$_1$❑ Yes
$_2$❑ No
$_3$❑ Not Sure

14. What type of produce do you normally buy when purchasing each item? (Leave blank if you never buy that item.)

	Conventional	Transitional	Organic
Apples	1❑	1❑	1❑
Grapes	2❑	2❑	2❑
Oranges	3❑	3❑	3❑
Lettuce	4❑	4❑	4❑
Onions	5❑	5❑	5❑
Potatoes	6❑	6❑	6❑

15. For how many people do you normally buy food?

1❑ Only myself
2❑ _____ people
3❑ I do not buy my own food

16. About how many times a month does your household buy each of these types of produce?

1___ Apples
2___ Grapes
3___ Oranges
4___ Lettuce
5___ Onions
6___ Potatoes

17. Where do you typically buy your produce? (Mark all that apply)

1❑ Regular grocery store (Safeway, Albertson's, etc.)
2❑ Discount food store (Costco, Winco, etc.)
3❑ Grocery store with some natural foods (Market of Choice, Trader Joes, etc.)
4❑ Natural food store (Sundance, The Kiva, etc.)
5❑ Farm or farmer's market
6❑ Other (please describe) _____
7❑ Do not usually buy produce

18. To what extent do you consider yourself to be an environmentalist?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not at all						To a large degree

19. Would you be willing, in principle, to pay a premium for transitional organic produce if doing so helped farmers convert to organic production?
    - 1❑ Yes
    - 2❑ No
    - 3❑ Not Sure

20. Do you think that government subsidies should be provided to farmers to help them convert to organic production?
    - 1❑ Yes
    - 2❑ No
    - 3❑ Not Sure

To help us combine your answers with those of others who are like you, please tell us a little bit about yourself.

1. What is your gender?
   - 1❑ Male
   - 2❑ Female

2. What is your age? _____

3. What is your highest level of education?
   - 1❑ Less than high school
   - 2❑ High school graduate
   - 3❑ Some college (no degree)
   - 4❑ Degree (occupational)
   - 5❑ Associate degree
   - 6❑ Bachelor's degree
   - 7❑ Master's degree
   - 8❑ Professional degree
   - 9❑ Doctoral degree

4. In terms of politics, how do you consider yourself?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Extremely liberal			Moderate			Extremely conservative

5. We need to know the extent to which people who have taken this survey represent the population of Lane County. Please tell us how you would identify yourself using the standard census categories for race and ethnicity. (Mark all that apply).

   - 1❑ American Indian or Alaska Native
   - 2❑ Asian
   - 3❑ Black or African American
   - 4❑ White
   - 5❑ Native Hawaiian or Other Pacific Islander
   - 6❑ Hispanic or Latino
   - 7❑ Other _____

6. What is your five-digit **zip code? _____**

7. What is your approximate annual **household** income – from all sources including work, investments, social security, public assistance, etc.? (Remember that no one will be able to link the information on this survey to your identity.)

1❑ Less than $5,000
2❑ $5,000 – $9,999
3❑ $10,000 – $14,999
4❑ $15,000 – $19,999
5❑ $20,000 – $24,999
6❑ $25,000 – $29,999
7❑ $30,000 – $39,999
8❑ $40,000 – $49,999
9❑ $50,000 – $59,999
10❑ $60,000 – $79,999
11❑ $80,000 – $99,999
12❑ $100,000 – $149,999
13❑ $150,000 – $199,999
14❑ $200,000 or more

8. Think about the way information in this survey was presented. How important do you think it is *to this research team* for people just to buy **conventional** products?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not important at all			Neutral			Very important

9. Think about the way information in this survey was presented. How important do you think it is *to this research team* for people to buy **organic** products?

❑	❑	❑	❑	❑	❑	❑
1	2	3	4	5	6	7
Not important at all			Neutral			Very important

10. Comments or feedback?

Thank you for participating in this survey. Please place your completed survey in the box labeled "Return Surveys Here."

[Data Entry: Choice set design version # 127]

APPENDIX B

THINK-ALOUD CONSENT

Consent to Participate in Research: Test Participant

You are asked to participate in a research study conducted by Marissa Williams, a graduate student at the University of Oregon. You were selected as a test participant because you are a current student, a prospective student, a family member of a prospective student, or a visitor to the University of Oregon campus.

We are in the process of designing a survey concerning public support for organic produce. If you volunteer to participate in this study, we would ask you to work through a trial version of the survey and talk aloud about any questions or comments you have.

There are no anticipated risks or discomfort in this study. Your participation as a test participant is an important part in the development of a survey. Once the survey is finalized and information collected from the general public, results from this study could help further our collective understanding of consumer decision-making in the transitional organic market.

If you have any questions or concerns about being a test participant, please feel free to contact the researcher in charge Marissa Williams at mwilli10@uoregon.edu or (559) 906-4054.

If you would like, a copy of this verbal consent statement will be given to you for your records.

BY COMPLETING THE TALK-ALOUD TRIAL SURVEY YOU ARE GIVING YOUR CONSENT TO PARTICIPATE IN THIS RESEARCH STUDY.

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