Community Supported Agriculture Membership: Characterizing Food and Sustainability Behaviors

by

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ABSTRACT

Community Supported Agriculture programs (CSAs) have become a viable local source of fresh agricultural goods and represent a potentially new way to improve fruit and vegetable consumption among individuals and families. Studies concerning CSAs have focused mainly on characteristics of the typical CSA member and motivations and barriers to join a CSA program. The purpose of this study was to examine whether behavior and attitudinal differences existed between current CSA members and a nonmember control group. Specifically, ecological attitudes, eating out behaviors, composting frequency, and family participation in food preparation were assessed. This study utilized an online survey comprising items from previous survey research as well as newly created items. A total of 115 CSA member and 233 control survey responses were collected. CSA members were more likely to be older, have more education, and have a higher income than the control group. The majority of CSA members surveyed were female, identified as non-Hispanic and Caucasian, earned a higher income, and reported being the primary food shopper and preparer. The majority of members also noted that the amount and variety of fruits and vegetables they ate and served their family increased as a result of joining a CSA. CSA members were more ecologically minded compared to the control group. Frequency of eating out was not significantly different between groups. However, eating out behaviors were different between income categories. CSA members spent significantly more money at each meal eaten away from home and

spent significantly more money on eating out each week. In both cases, controlling for income attenuated differences between groups. CSA members composted at a significantly higher rate and took part in other eco-friendly behaviors more often than the control group. Finally, no significant difference was evident between the two groups when analyzing family involvement in food preparation and meal decision-making. Overall, some significant attitudinal and behavioral differences existed between CSA members and non-CSA members. Further research is necessary to examine other distinctions between the two groups and whether these differences occur as a result of CSA membership.

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CHAPTER 1

INTRODUCTION

Background

Food-related behaviors in the United States are complex, and the places consumers purchase foods continue to evolve. For instance, consumers are eating away from the home more often and spending more money in doing so. According to a study comparing National Health Interview Survey (NHIS) data with results of the National Health and Nutrition Examination Survey (NHANES), individuals were 40% more likely to eat three or more commercially prepared meals per week in 2000 than they were in 1987 (1). Similarly, approximately 57% of individuals consumed at least one food away from home per day in 1994-1995 compared to only 43% in 1977-1978 (2). Trends in eating out have been associated with the growing waistline of Americans as well (3-5). Processed foods prepared outside the home often contain more fat, saturated fat, and calories compared to foods prepared at home (2).

However, a growing subset of consumers is now seeking out alternative sources of unprocessed foods that require more home preparation. As a result, the market for locally grown agricultural goods is emerging (6). Additionally, some small- and medium-sized farms are turning away from conventional, corporation-run agriculture and instead participating in direct marketing to consumers. These farms sell to customers through farmers' markets, food co-ops, farm stands, and

community supported agriculture programs (CSAs). CSA, in particular, has been spreading its roots in recent years by becoming a viable local source of fresh agricultural goods. What started as two small distributors in the Northeastern United States during the 1980's grew to 1,300 CSA programs in 2009, and more continue to sprout up across the country (6).

Although many different types of CSAs exist, the program is usually run out of a single farm. Members of a CSA sign a contract at the beginning of a growing season, paying up front for a "share" of agricultural products being grown at the farm. In return, the farmer provides weekly allotments of those goods to CSA members for the duration of the growing season. By paying for all weekly shares up front, members provide the farmer with the capital necessary to run farm operations. By purchasing from a local farmer, members are guaranteed fresh, seasonal whole foods on a consistent basis (7).

The CSA trend continues to grow, but research on producers, consumers, and CSA programs themselves is limited. The current body of literature focuses primarily on describing the typical CSA member and identifying motivations for involvement with local foods or barriers to participation. Within this small body of literature, few consistent themes have emerged. For instance, demographic data collected from various samples of CSA members fail to provide consistent results. Although many studies support the prevailing concept of the average CSA member - one who is of European ancestry, is more highly educated, and who earns more

than the general population (8-11) - data from other studies suggest the picture is not at all clear. Kolodinsky and Pelch found that income level was unrelated to interest in local food (12), a result repeated in at least one other study (13). Jekanowski and colleagues also found education level to be negatively related to interest in local foods (14).

Data on motivations for involvement in CSAs are relatively more consistent. Most studies in this area show the most common perceived advantages of CSA involvement include receiving safe and nutritious quality produce on a consistent basis, supporting the local farmer, and supporting environmental sustainability (8-11, 15). Researchers noted that a number of these motivating factors also are reasons that CSA participants retain membership (10). Many studies show, however, that participant turnover is high due to multiple perceived barriers. These most often included the limited choices of CSA produce offered, the lack of variety, issues of seasonality, inconvenient pick-up times, and the occasional burden of excess produce resulting in unwanted waste (10, 15).

Statement of the Problem

Although data have been collected regarding demographic characteristics of CSA members as well as motivations for involvement, a number of questions about CSA members and their behaviors remain unanswered. For instance, assessments of food- and sustainability-related behaviors among CSA members is lacking in the current body of literature.

Similarly, no studies have compared CSA members and non-members regarding these behaviors. Learning about these differences will provide greater insight into whether CSA involvement is part of a broader attitude towards food and the environment. Furthermore, it will provide directions for future research to determine whether or not CSA involvement can drive a change in attitudes or behaviors regarding food, the environment, and sustainability.

Current Research Deficiencies

Current CSA research has focused on identifying the types of individuals who get involved in CSAs as well as issues related to sustained involvement or participant turnover. Very little research has focused on how CSA involvement affects other aspects of members' lives, in particular food-related behaviors and attitudes. One unpublished survey study showed an increase among CSA members in fruit and vegetable consumption and on time spent preparing food (10). Another qualitative study was conducted with focus groups and follow-up surveys assessing modified eating or cooking habits among CSA members. These data showed an increased appreciation of food seasonality and a preference for seasonal foods (16). Data also showed an enhanced appreciation for farming (16). To the author's knowledge, no peer-reviewed studies have been published comparing CSA members to non-members regarding these behaviors and attitudes. In particular, the current body of literature lacks

data on members' at-home eating habits, food-purchasing behaviors, and food preparation behaviors compared to non-members.

The body of literature on CSA participation also fails to provide comprehensive data regarding the relationship of CSA involvement with food attitudes and behaviors of family members of participants. Andreatta, Rhyne, & Dery conducted a study of participants in Project Green Leaf, a program that provided free CSA shares to individuals in low-income households (17). Although participants in this program identified some food-related behavioral changes to CSA participation, researchers noted an increased awareness among children in these households of the source of their food. In another study, Perez and colleagues found that CSA participants spent a greater amount of time preparing food at home after joining the CSA, potentially impacting family diets (10).

Finally, environment- and sustainability-related attitudes and behaviors of CSA members have not been well measured. Some studies have noted environment-related factors, such as support for organic food production, are among the perceived motivators for joining a CSA program (9, 15). One study, in particular, included assessment of the New Ecological Paradigm (NEP), a measure of an individual's environmental values and attitude towards ecological scarcity. Researchers found that NEP scores were significantly correlated with motivations to join a CSA (11). However, to the best of the author's knowledge, studies examining the relationship between sustainable practices, such as recycling or

composting, have yet to be conducted among CSA participants. Also, the endorsement of the NEP by CSA members versus non-members has not been compared.

Purpose

The primary objectives of this study were to compare both attitudes and food-related behaviors of CSA members with non-members. In particular, the study assessed ecological attitudes, food purchasing behaviors, food preparation behaviors, and sustainability-related behaviors such as composting and recycling.

Hypotheses

The following hypotheses were tested:

1. CSA participants will score significantly higher on the New Ecological Paradigm scale compared to non-members.
2. CSA participants will eat away from home less often and spend significantly less money on eating out compared to non-members.
3. CSA participants will compost significantly more often than non-members.
4. Family members of CSA participants will be involved in food preparation and decision-making significantly more often than family members of non-members.

Definition of Terms

1. Community Supported Agriculture: a contract-based program in which community members pay a local farmer in advance in exchange for regular allotments of that farmers' agricultural goods.
2. Shareholder: CSA member who shares in the agricultural benefits and risks of a CSA farm.
3. Sustainable Practices: Any behavior that is performed with the intention of reducing a carbon footprint, relying less on nonrenewable resources, or reducing one's impact on the environment.

Delimitations

The study will include current CSA members who receive produce from Crooked Sky Farms in Arizona through the farm's multiple distribution points. The study will also include individuals recruited through advertisements posted on all Arizona State University campuses, the University of Arizona campus, and the Northern Arizona University campus.

Limitations

This study may not apply to CSA members in other areas of the country or the state and can only be reasonably applied to members receiving produce from a farm in the state of Arizona. Also, the survey tool utilized in this study includes both previously validated and newly created,

non-validated items. The survey was rigorously pilot-tested, but the survey as a whole has not been tested for validity or reliability.

Significance

Though a causal relationship cannot be inferred from the data gathered in this study, it can form the foundation for subsequent studies that explore the impact of CSAs as nutrition and sustainability interventions. Where differences are identified regarding food and sustainability behaviors between CSA members and non-members, interventions can be developed to test whether or not CSA programs themselves can elicit such changes. These future studies would help substantiate CSAs as potentially useful intervention programs across a range of behaviors. CSA programs may be useful for individuals who are ready to make healthy dietary changes but may need additional social support and continual encouragement. However, barriers exist that may detract participants from a lower-income bracket. Issues of transportation and affordability need to be resolved prior to recommending these programs as a possible intervention for improving overall diet.

Positive changes potentially caused by CSA participation might also be motivators for a number of other related behaviors. For example, joining a CSA might increase an individual's ecological sensitivity, which could impact interest in other eco-friendly behavioral changes such as composting and recycling. Furthermore, a CSA's influence to both

consume and compost more produce might also increase interest in related behaviors such as gardening and overall healthy eating. Increased use of produce at home could also have a favorable effect on money spent on food away from the home as well as overall nutrient composition of household diets. For example, foods cooked at home typically contain less added salt, fat, and calories than restaurant or pre-packaged foods (2). Finally, the potential for CSA membership to increase the family's involvement in food preparation could teach family members life-long skills such as cooking from scratch and healthy eating.

CHAPTER 2

REVIEW OF LITERATURE

Definition of Community Supported Agriculture

Community Supported Agriculture is an alternative agricultural system that establishes a relationship between farmers and community members while contributing to strengthening the greater community. The program promotes local environmental and human stewardship by providing consumers with healthy, locally grown food while at the same time supporting the farmer growing that food (18) . In a CSA program, members form a contractual agreement with a local farmer, establishing two important tenets. The first is the commitment of the farmer and the member to contribute to development of a robust local food system (17). CSA produce generally travels less than 200 miles, maintaining the locality of the food (19, 20). Also, a greater portion of the money spent on produce grown locally stays within the local economy (21).

The second tenet is supporting local farmers and agriculture as part of the broader community (17). Most often, CSA members receive a continuous allotment of farm goods during a growing season and, in exchange, the farmer receives some financial security or a “true return” on goods and services that are provided to the consumer (22).The farmer typically receives his or her true return at the beginning of the season to cover the cost of production, the cost of regular farm operations, and wages for the farmer and farm employees (23). This arrangement can be important in weathering the volatility of agricultural markets, and it

provides the farmer the ability to keep running the farm and earn a living even during poor growing seasons. Members, therefore, enter a CSA prepared to receive less produce than normal during times of agricultural hardships. Due to the relationship established between grower and consumer, CSA members become, in essence, "shareholders" of their local farm. And in fact, it is often members who help grow CSA membership bases. Although advertisements touting the benefits of joining a CSA can be effective, learning about a CSA program via word-of-mouth generally increases the likelihood that an individual will join the program (10, 12). Sixty-eight percent of members interviewed in one study said they joined a CSA because of the direct relationship they had with the farmer or another shareholder (9).

History of Community Supported Agriculture

CSA has its roots in Japan where the first recorded CSA farm started in 1965 (24). Japanese women, at the time, were concerned over the decrease in land devoted to farming, the increase of food imports to the country, and environmental degradation (11, 18, 25). In response to these issues, local women began requesting that local farmers produce a greater portion of their food. Community members and farmers therefore established a partnership of mutual support (11, 24, 26). From this, the term "teikei" was born. "Teikei" translates directly to "partnership" or "cooperation." Philosophically translated, it means "food with the farmer's face on it" (26). It was from the desire of these Japanese women to

maintain strong ties to their land and support their local community that the concept of CSA was born.

CSA programs did not arrive in the United States until the 1980s, after already becoming popular in Germany, Switzerland, and other parts of Europe (15, 27). The first CSAs began in Massachusetts and New Hampshire in 1984 (11, 28, 29). In Egremont, Massachusetts, Jan Vander Tuine and Robyn Van En formed the first core group of CSA farmers beginning with a small apple orchard and eventually offering vegetables in 1986 (18, 26). A German by the name of Traugher Groh decided to start a similar project in New Hampshire from the experience he had gained from starting one in his native country (15).

Since this time, the number of CSA farms in the United States has grown to approximately 1,400 according to the Robyn Van En Center's 2011 database list (6). The highest concentrations of CSAs are located in the heavily populated regions of the Northeast, the upper Midwest, and the West Coast (6, 18, 30). Nationwide, over 340,000 individuals participate in CSAs across every state in the U.S. (6, 30, 31). According to the Alternative Farming System Information Center, the states with the highest number of CSAs include New York (84), California (77), Pennsylvania (61), Massachusetts (59), and Wisconsin (58). The lowest number of CSA programs is in South Dakota, where only five CSAs currently exist (31).

Description of CSAs and CSA Farms

As the CSA concept spread throughout the country, deviations from the original CSA program design began to emerge. Though the underlying concept remains the same, great variety now exists among CSA programs and CSA farms. CSA programs can vary in membership structure, distribution style, and membership capacity. CSA farms can differ in size, practices, and operation as well.

CSA programs can generally be described as Farmer-driven, Consumer-driven, Farmer Cooperatives, or Farmer-Consumer Cooperatives (18). In Farmer-driven CSAs, the farmer is responsible for making most of the management and production decisions. This is the most prevalent type of CSA in the United States. In the Consumer-driven CSA, a farmer is hired to grow the produce that the consumers want. Most day-to-day production activities, however, are still the responsibility of the farmer. Farmer Cooperatives pool together the resources of two or more farms in the same area, allowing them to offer a wider array of goods. Like Farmer-driven CSAs, it is the farmers' responsibility to manage farm operations. Finally, in the Farmer-consumer cooperative, the land is co-owned between the farmer and members and almost all the responsibilities are shared between the two groups (18). Within these arrangements, some CSAs request or, less often, require their members to work on the farm for a given number of hours per week. This is usually done in exchange for a partial- or full-price reduction in the share cost (28).

CSA products are usually distributed either weekly or biweekly for a predetermined number of weeks or months. The goods that are distributed consist mostly of produce. However, some CSAs provide animal products, baked goods, flowers, and/or honey for their members (32). CSA shares can be distributed at the farmers' market or the farm from the farmer him- or herself. Another common CSA design includes one farm with several distributors (33). The distributors are in charge of recruiting members, managing finances, and distributing produce to the members. Individuals receive their produce at an established pick-up center in either a public venue or at a member's residence. In some cases, shares are delivered to an individual's home. However, home delivery formats typically cost more (33).

Traditionally, members do not have a choice as to what items will be offered as part of each share from week to week. However, many CSAs have begun employing a variety of alternative delivery systems. For example, some CSAs now use a "mix-and-match" or a "market-style" approach. These CSA programs cater to personal preferences among individual members. Rather than giving all members the same allotment, each member is allowed to pick what they like from the farmer's weekly offerings. Items that are in limited supply, such as strawberries, may be restricted to one portion per member (31). Other CSAs offer the option of a full share or a smaller half-share in which members either couple up with another shareholder or they are given half the normal allotment. Additionally, some CSAs offer basic or gourmet options, which contain

different varieties of produce (28). Finally, some offer a bulk or "canning" share that contains a large quantity of a particular item (28).

CSA farm sizes, practices, and operations can vary greatly as well. CSA farm sizes range from less than two acres to over 500 acres (34). In general, however, sizes of CSA farms are still relatively small compared to their industrial counterparts – three acres on average compared to the national average of 18 acres – in an effort to keep the small independent farm alive (10, 30). Thirty-four percent of CSA farms have less than 10 acres, and 77% have less than 30 acres (35). And while many of these farms operate exclusively as a CSA farm, many others also grow produce, animals, or other products for sale through other venues, such as farmers' markets or restaurants (36). Roughly 94% of CSA farms also practice some form of organic or biodynamic agriculture, although many do not obtain official certification like larger producers due to cost (25, 35). In one survey of 248 CSA farm owners, 100% of the respondents reported growing organic goods regardless of whether they were certified as such (18). These small farms can grow food for between 10 to 1,000 local community members (30).

In terms of location, CSA programs are more likely to be found in rapidly growing and very urbanized or suburbanized communities (30). Schnell and colleagues found that areas with CSAs grew in population at a rate of 15.1% per year between 1990 and 2000 compared to rate of 10.3% per year among communities that lacked a CSA (30). Furthermore, CSAs tend to be found in areas with a greater number of small farms (30). This

is attributed to the primary production of vegetables, which produce a greater economic yield per acre and can therefore be cultivated on less land (30). Also, densely populated urban or suburban areas are better able to support small farms compared to small rural populations (30). Another venue that has been proposed for CSA programs is college campuses. These locations, quite often embedded within a larger town or city, can attract students, faculty, staff, and community members from the surrounding area by providing a convenient pick-up location for CSA shares (7).

Motivators for CSA Membership

A handful of studies have documented the numerous motivations for CSA participation. Motivations include interest in healthier food, such as access to produce that is perceived to be of higher quality, better taste, increased nutrition, and improved safety (8-11, 22, 28, 32, 37-40). Other motivations include non-health related issues, such as supporting local farmers and the community, knowing the origin of one's food, concern for the environment, and issues of cost and convenience (8-11, 22, 28, 32, 37, 38, 40). Among these motivators, both food quality and interest in connecting with the local farmer seem to be most prevalent. In one study of a newly formed CSA in Ohio, the results of a survey revealed new members identified issues of trust and dietary health as important factors for joining a CSA (28). These factors were not as important, however, as the desire for produce that was fresh, organic, and local (28). Another

study by Lea and colleagues showed similar results using a consumer beliefs survey (37). In this study, respondents noted that produce sold by conventional retailers was of lower perceived quality and inferior taste compared to produce purchased through a CSA (37). And, support for a local farmer was not only identified as important but also thought to extend to support for the local community (37). Respondents noted that CSAs could be important to the community through financial support as well as developing community activities and relationships (37).

The ecological viability of CSA produce is another important motivator for CSA membership. Many individuals join because they want local and organically produced food that is in season, which is perceived to have a decreased impact on the environment relative to its conventional counterpart (8, 10, 11, 22, 28, 32, 39, 40). The results of a survey conducted by Perez and colleagues revealed that the most frequently reported "important reasons" for joining a CSA were the desire for local, organic fruits and vegetables and to support local producers (8). These same two reasons were the top motivators, after the desire for fresh food, in surveys of CSA programs in Illinois, New Hampshire, and New York (11, 39). Concern for a healthy environment and interest in organic produce were also top reasons for joining CSAs in two separate studies (10, 28).

Although many motivators for joining a CSA exist, a variety of related factors affect the extent to which CSA members maintain membership over time. For instance, members who are more likely to return in the short-term tend to be members of the CSA for longer and are

older than other members (38). They are also more likely to come back if the pick-up time was convenient, they felt the share price was fair, the payment did not pose a financial hardship, they were satisfied with the variety of produce, or they were not throwing out or composting more produce than before joining (8, 28). In a study in Wisconsin, members returned to their CSA because they wanted to access high-quality produce, support their local farmers, get exposed to new foods, and be part of a community (16). Researchers also noted that this particular CSA had a high retention rate because of its nearby location in an urban environment, because it was part of a larger organization, and because a sense of loyalty had developed for the managing farmer (16). Another study found that those who voiced concerns related to the environment or society were more likely to remain CSA members (28). Still other research has shown that those who were most committed to the grower, rather than the produce they received, renewed their membership more often (16, 17). Long-term returnees have also been members for longer, tend to have a higher income than other members, and purchase most of their vegetables from the CSA (38).

Member satisfaction is also a major predictor of membership retention. One study found that certain demographic factors, such as being female and being older, were positively correlated with membership satisfaction (33). Other components that contributed to increased satisfaction included aspects of membership involvement such as the number of visits to the CSA, increased membership length, and

participating in a working membership (33). Interestingly, those who were vegetarian or consumed a higher percentage of CSA produce as part of their diets also noted higher satisfaction with their programs (33) Quality, quantity, and freshness of CSA produce are particularly important for member satisfaction, and thus retention (8, 38, 40). Eighty-three percent of Prarieland CSA members, located in Illinois, reported that they would purchase a share next season in part because they found the cost of shares to be acceptable (40). These members also found produce quality, quantity, and variety to be appropriate; they placed value on receiving locally grown, organic produce; they valued knowing the farmer; and they liked the idea of eliminating the "middleman" (40). A separate study found that if individuals believed they consumed more produce over time and used a higher percentage of their share each week, they were more likely to return for the next season (38).

Barriers to CSA Membership

Although there are many good reasons to participate in a CSA program, many circumstances can hinder an individual joining or maintaining membership. Factors that impede the initiation of CSA membership include the per person cost of membership, the presence of children or adolescents in the household, lack of produce choice, potential for waste, and limited storage space (12, 37). In one study, a 10% increase in per person cost of CSA shares resulted in a decreased probability of joining from 0.067 to 0.054. (12). Conversely, a 10% decrease in cost

resulted in a probability of joining of .078, a 17% increase from the baseline probability of joining a CSA. (12). In a survey study in Amherst, Massachusetts, while only 2% of CSA members were concerned about the cost of a share, about half of respondents thought that it would cost the same or more than if purchased in a store, a common concern among those who purchase local foods (15). This is a contention not well supported by the literature: when CSA prices are compared to organic produce at retail stores, or to conventional produce at regional, national, and local stores, CSA produce is similar or consistently lower in price (15, 39-41). It is possible that other factors are in play, however. Researchers have suggested that when members become dissatisfied due to lack of choice in a CSA, shares can actually seem more expensive (40). In another study, 50% of shareholders reported being willing to pay 10% to 20% more for a CSA share at the beginning of a CSA season based on their high expectations of the program (28). However, at the conclusion of the season, many fewer were still willing to pay a perceived premium for CSA produce (42).

The potential for waste of produce can also be an important barrier to joining a CSA or maintaining membership (15). Due to CSA members' lack of choice, the likelihood of receiving unwanted items, and thus of wasting a greater percentage of CSA shares, is increased (37). Also, CSA share quantity can be too much for some CSA members, which again can contribute to excess waste (40). To help overcome the problem of waste, many CSAs have adapted by providing recipe cards or suggested uses of

less familiar produce (40).

Perceived disadvantages of CSA membership, including limited choices, the lack of variety due to seasonality, inconvenient pick-up times or locations, transportation issues, and receiving more produce than can be used, all can be particularly problematic for continued involvement in CSA programs (8-10, 15, 37, 38). Overall member retention continues to be one of the greatest problems for farmers as most CSA members leave before the two-year mark (38). Only 20% of CSA members in a central California coast program, for example, remained with the program for more than four years (8). Another study reported the average annual retention rate of 13 CSA farms in 2002. On average, only 53% of members retained membership year to year (38). Other studies have calculated the average CSA participant turnover at between 30% to 50% from year to year (43). This rate can be even higher in the initial years of a new CSA program (43).

Many individuals become disappointed with the lack of choice inherent in most CSA schemes. In one study in Wisconsin and Minnesota, "Supermarket withdrawal" was noted as the primary reason for a 36% decrease in membership over the course of a year (22). Members stated that they missed the convenience of getting the items they wanted when they wanted them (22). Data from another study revealed that four out of five non-renewing members had a strong preference for selecting their own vegetables, an issue that led to the termination of their memberships (16). Other research has shown that 54% of non-renewing CSA members

decided to leave their program due to inconvenience (10).

Overabundance of produce, beyond that which is utilizable by CSA members, also factors into membership decisions. Multiple studies have documented member attrition due to increased food waste (15, 28, 37). One study showed that members felt guilty for being unable to consume all the produce received (43). A survey of first-time CSA members showed that 92% received CSA items they did not like, which resulted in waste (28). Eighty-two percent of CSA members from an Ohio program stated that, most often, unwanted or unused CSA food was given to someone else (28). However, feeling obligated to give excess produce away could contribute to dissatisfaction. CSAs have attempted to address this issue by altering share options, for example by providing half-shares or split-shares. Members who have received such options have been shown to be more satisfied with CSA membership, perhaps because portions become more manageable (33).

The CSA Member Profile

Although a basic question, characterizing the "average" CSA member has proved relatively difficult. A number of studies support commonly held assumptions regarding the type of individual who most often participates in programs such as CSAs. The most consistent findings tend to show that the majority of members are female and of European-American descent (8-12, 16, 22, 28, 32, 38). In a large survey study of southeastern American CSAs, for example, 84.6% of members were

women (43). Some research suggests this could be due to the still-common role of women in food procurement and preparation (44). Another study of 4,900 CSA members on the central California coast showed that 90% of respondents were of European-American descent (8).

CSA members often are characterized as middle- to high-income earners and as having attained a higher level of education (8, 11, 16, 32). Although consistency exists among data regarding education level, data related to income are less clear. In a study of CSA members in New Hampshire and Illinois, members earned considerably above both state averages for income (11). However, some studies have shown either no preponderance of a particular income level, no distinct range in income among members, or a lower average income (28, 38). In a study of a newly formed CSA in Ohio, the modal annual income was between $25,000 to $49,000, much lower than what might be considered the upper-income range (28). Regarding education, a number of studies to date have shown that higher levels of education are strongly related to CSA participation (8, 11, 12, 16, 38). In one study of CSA membership, for example, 60% of members surveyed completed at least some post-graduate work, and in a separate study, the majority of CSA members had either a graduate or professional degree (9, 10, 28). Furthermore, a study analyzing the probability of becoming a member using a binomial logit regression model indicated that increased education increased the probability of becoming a CSA member (12).

The areas in which CSA members generally live are rather diverse as well, as is family make-up (9, 10, 22, 28, 38). One phone interview study conducted by Cone and colleagues showed that all CSA members participating in the study were urban dwellers (9). However, in a survey of 276 CSA members in the Mid-Atlantic region, most respondents reported living in a suburban area (38). It was also found that the majority of households surveyed had children (63%) and both the husband and wife worked full time (27%) (10). In contrast, an investigation of a CSA in Madison, Wisconsin revealed that members were less likely to have children but, as found in the previous survey, were more likely to be employed (16).

Health and Other Impacts of CSAs

CSAs have the potential to impact individuals and communities in a number of ways, in terms of both health and sustainability. Almost all renewing members of the Troy Community Farm CSA in Madison, Wisconsin, for example, noted some sort of behavioral or attitudinal change since initiating membership (16). Of all participants, 61% reported increased awareness of seasonality of produce, which factored into food purchasing decisions (16). Fifty-two percent of members also experienced a change in food preparation behaviors, such as planning meals around CSA produce, changing the way they cooked, becoming more involved in food preparation, trying new foods, eating out less, and storing or freezing more vegetables (16). Food consumption behaviors also changed.

Participants reported eating more fresh vegetables (and, for some, concomitantly less meat) and wasting less produce overall (16). In a separate study conducted in the central coast of California, 79% of CSA members reported increased intake in amount and variety of fruits and vegetables, and 59% noted more time spent preparing foods (8). Furthermore, 81% of individuals revealed that they were cooking and eating differently (8). Other research from four CSA farms in Pennsylvania indicated that 74% of members had increased the variety of produce they consumed and 58% had increased the quantity they ate (38). Survey data from CSAs in Minnesota and Wisconsin showed that CSA participation led to eating more total produce as well as greater variety, as well as shopping less often at grocery stores and adopting healthier eating habits overall (22). Ninety percent of respondents in this study said that after joining a CSA program, their household eating and shopping habits had changed in a positive way (22).

The changes in health-related habits and attitudes comport with CSA members' reported or measured diet quality. One study demonstrated higher intakes of dark green and yellow fruits and vegetables, vitamin A, and fiber among CSA participants (45). The same study showed lower intakes of saturated fat among participants as well (45). Literature in this area is scant, however, and it is difficult to attribute positive dietary factors to CSA membership per se. For instance, CSA produce could be superior in nutritional quality compared to store-bought produce depending on harvest and travel time. For example, a 30 to 50% loss in nutrients can

occur in fruits and vegetables within 5 to 10 days after harvest (46). CSA produce might on the whole retain a greater amount of nutrition as it often is delivered to members very close to the time it is harvested, sometimes on the same day (47). It is possible, however, that superior diet quality among CSA members could be related to non-CSA factors, such as education or income (48).

CSA programs can also have a positive impact on food security efforts in a community. Many CSA programs have made extensive efforts to overcome income barriers to improve access for low-income individuals and families. At the 'front end' of the program during which members are being recruited, this can include accepting government food assistance for payment, setting up payment plans and working shares, offering low-cost shares, and subsidizing low-income shares (49). Connecting with food assistance programs, in particular has shown great success in allowing low-income individuals to join a CSA (50). CSAs can address food security at the 'back end' of the program as well. Some CSAs donate leftover produce from weekly distributions to local area food banks or soup kitchens (7, 36). Eighty-one percent of CSA managers in one study employed at least one tactic to attract low-income customers to join, and 61% attempted at least one food recovery tactic – typically food donations (50). Interest in these strategies could be growing, as one CSA survey conducted in New York state revealed that 80% of CSA managers were interested in reaching out to more low-income individuals (36). Seventy-

seven percent of CSA managers in another study also felt it was important to address issues of food access and affordability (50).

CSAs as Vehicles for Health Promotion

Given many of the potential food access and health-related benefits noted above, CSA programs could be important in helping individuals meet fruit and vegetable intake recommendations outlined by the most recently updated Dietary Guidelines for Americans (DGs) (51). The DGs are a set of evidence-based recommendations for people aged two years and older developed by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture (52, 53). These guidelines are the foundation of federal nutrition education and nutrition policy, and they are used by health professionals to assist individuals in planning a healthful diet (52, 53). Since 1980, the DGs have been revised and updated every five years; the most current update occurred in 2010 (52). The 2010 overhaul of the DGs not only included a focus on increased fruit and vegetable consumption, but also suggestions for sourcing from sustainable programs, such as farmers' markets and CSAs (51). This focus on fruits and vegetables is part of a broader health promotion strategy to help Americans meet nutrient needs while moderating calorie intake. Fruits and vegetables are a low-calorie and nutrient-dense source of many underconsumed vitamins and minerals, including folate; magnesium; potassium; dietary fiber; and vitamins A, C, and K (51). Perhaps because of the reported increases in amount and variety of produce consumed as a

result of CSA membership, CSA members have been reported to have improved nutrient intakes (8, 16, 22, 38, 45).

CSAs also could be an important response to the DGs' "Call to Action" that emphasizes Americans' need for access to nutritious foods (51). As part of the call to action, the guidelines urge the development and expansion of safe, effective, and ecologically viable agricultural practices so that all segments of the population have access to healthy foods (51). As interest in local foods programs such as CSAs grows, CSAs can become a larger part of the food access solution.

CHAPTER 3

METHODOLOGY

Participants and Recruitment Procedure

Convenience samples of CSA members and nonmember controls were recruited to participate in this study. Participants for the CSA member group were recruited from CSA programs that operate within the state of Arizona. This list was generated from LocalHarvest (www.localharvest.org), a website used to find sustainably grown food within a local area. CSAs and their coordinators who work with Crooked Sky Farms were also identified using the farm's website. Crooked Sky Farms is a large, local and certified naturally grown farm based in Phoenix, Arizona. The farm supplies produce to nine CSA distribution points located in several areas in Arizona as far south as Tucson and as far north as Flagstaff.

Participants for the control group were recruited using advertisements placed in several high-traffic facilities at the Arizona State University (ASU) Tempe campus, the University of Arizona (U of A) campus, and the Northern Arizona University (NAU) campus. The geographic locations of these campuses coincided with the largest CSA distribution points in Arizona. Advertising was executed in these areas in an attempt to recruit demographically similar control participants. Individuals for the control group were also recruited by contacting several university departments or programs via e-mail at ASU, U of A, and NAU and requesting that an advertisement for the survey be sent out to

individuals on their respective listservs. Verbiage for the advertisement was included in the e-mail that was sent to the department or program.

CSA members and nonmember controls were invited through these advertisements to complete one of two online surveys: one created for control participants, or a second that mimicked the control survey but included CSA-member specific questions as well. The advertisements informed potential participants that the online survey was about food behaviors; it also noted that those who completed the ten- to fifteen-minute survey would be entered in a drawing for one of 20 $10 Target gift cards. The eligibility criteria were also listed on the flyer and noted that participants had to be 18 years or older and could not have participated in a CSA or visited a farmers' market in the past six months. The advertisement posted on campuses included several tear-off tabs with the researcher name and e-mail address. Those sent by e-mail included identical information in the form of a portable document format (pdf) file.

CSA-member participants were recruited via CSA coordinators. CSA coordinators were sent an email that included a brief explanation of the purpose of the study and a request to advertise the survey to their current CSA members. A letter inviting CSA members was attached to the e-mail. The letter included the researcher's background and contact information, the purpose of the study, the time it would take to complete the survey, information about the raffle, and the Internet address for the online survey. CSA coordinators were asked to include this letter in the e-mail sent to their CSA members. All potential CSAs were contacted during

June 2010 with an emailed invitation. A follow-up e-mail was sent after two weeks to ask CSA coordinators to remind their program members of the survey.

Post-advertisement, both groups were to have access to the online surveys for one month. However, based on the large volume of control responses, the control survey was closed two weeks early and the CSA survey was allowed to run for the remainder of the month. During that month, a second e-mail was sent out to CSA coordinators two weeks after the survey was launched to encourage additional recruitment of CSA members.

The research study was submitted for Internal Review Board (IRB) approval on June 2, 2010 prior to contacting participants and making the survey available on SurveyMonkey (www.surveymonkey.com). The study qualified as an exempt pursuant to Federal Regulation on June 3, 2010, allowing us to proceed with the study.

Survey Design

The initial survey for CSA members consisted of 36 questions. The survey was pilot-tested among 30 former CSA members who had participated in a small CSA program in the East Valley of Phoenix between January 2008 and August 2009. Participants in the pilot test were asked to complete the survey online and anonymously. A comment box was added at the end of each page so that individuals could identify any questions that were confusing to them or suggestions for improving each

item. Feedback from this pilot test was used to revise questions for clarity and led to inclusion of new questions to better assess attitudes and behaviors of interest. The revised survey was pilot-tested two more times among graduate students in the Nutrition Program at Arizona State University using the same methods. Feedback from both subsequent pilot tests led to revisions in questions for clarity.

The final survey for CSA members included 45 questions and 7 optional comment boxes in case clarification of an answer was needed (see Appendix 2). The control survey contained 35 questions and 2 optional comment boxes (see Appendix 3). Questions excluded in the control survey were those that pertained to CSA members only and were not used to compare the two groups. Using settings in SurveyMonkey, the online survey delivery mechanism, the surveys were designed so that any given question could be skipped by participants and so that the participants could quit the survey at any time. It was estimated that the survey took between 10 and 15 minutes to complete, which was communicated to participants on the advertisements and then again on the consent form. The CSA member and control surveys were divided into 21 and 18 pages, respectively, to avoid overwhelming the participant and decreasing respondent fatigue.

Each survey began with a consent form, which outlined the researchers' credentials, the study objective, inclusion criteria, how participants consented to the study, the study incentive, and contact information for the primary researcher and the Chair of the Human

Subjects Institutional Review Board. As described in the consent form, participants both provided consent and verified that they were 18 years of age or older by pressing a "Next" button at the bottom of the consent form page, completing the survey, and submitting it online through SurveyMonkey.

The first section of the survey included demographic questions for both CSA members and nonmembers. Specifically, two questions concerning how many adults and children lived in the household were included at the beginning of the survey. CSA members received additional questions at the beginning of the survey regarding their CSA history. The questions addressed how long the individual had been a CSA member and if they currently received a whole or partial share of produce. These questions were borrowed from a survey conducted by Goland concerning CSAs, food consumption patterns, and member commitment (28). The length of CSA membership was also asked.

The second section of the survey included The New Ecological Paradigm (NEP) scale, a measure of humans' relationship to nature (54). The NEP scale is an updated version of the New Environmental Paradigm scale. The New Environmental Paradigm scale was published in 1978 with demonstrated strong criterion, content, and construct validity (54). The revised NEP scale, created in 2000, improved upon several aspects of the tool by encompassing a wider range of ecological worldviews, including a more balanced portion of postively and negatively valenced NEP items, and using updated terminology. The NEP was included in the survey to

assess attitudes towards ecological preservation and the delicacy of the ecosystem (54). The instrument consists of a series of fifteen statements reflecting both positive and negative attitudes towards the environment. Participants were asked to rate their level of agreement with each statement using a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree.' The instrument includes items that are in both the 'positive' direction and 'negative' direction. In order to obtain a meaningful score, the ratings on positively worded items were first reversed so that all items provided ratings in the same direction. By summing the score of all fifteen items, a total NEP score was obtained. A lower total score indicated a stronger attitude towards ecological preservation.

Participants were then asked about the frequency of their involvement in environmentally sustainable behaviors using a set of items derived from a survey conducted by Barr to measure sustainable household waste management in the United Kingdom (55). Participants were asked how often they composted, recycled, used their own shopping bags, and bought produce with little packaging or reusable packaging. Participants responded to each item using a 5-point Likert Scale ranging from 'never' to 'always.' This set of items helped assess how active individuals were in sustainable behaviors indirectly related to food.

Two related items derived from a survey conducted by Perez and colleagues were included to measure food waste in the household (8). The first question asked participants to estimate the amount of edible produce

that was thrown out per week, excluding the inedible portions such as cores and peels. Participants were also asked to estimate how much produce, both edible and inedible, was composted on a weekly basis.

The next section of the survey consisted of items focusing on eating-out behaviors and home meal and food preparation behaviors. Most of the survey items concerning eating-out behaviors were derived from NHANES 2009 (56). Participants were asked to estimate how many times per week they ate out and how much money their household spent on food outside the home. Another set of items created for this study was used to determine the frequency at which participants ate at a variety of food establishments. For example, participants were asked to estimate how many times in the past week they ate at a fast-food restaurant, a sit-down restaurant, or a cafeteria. Participants also noted how often within the past week they bought "take-out" foods or had picked up food from a convenience store. In addition, individuals were asked to specify two or three establishments at which they frequently ate.

Participants also estimated how often food was cooked and consumed at home in the past week. Participants noted how many morning, afternoon, and evening meals most or all individuals in the household sat down to eat together. They were also asked to estimate how many times in one month they ate a home-cooked meal with non-household members at either their own home or a non-household members' home.

Household involvement in food preparation was assessed using several survey items. The first item measured how much time, on average, was spent preparing an evening meal in the household. This question was taken from a study conducted by Perez and colleagues that measured the profile and experiences of CSA members (8). Because the original item was devised for use in a CSA member survey, the item was altered slightly so that both the CSA members and nonmembers could answer it. Another set of items created for this survey and named the Family Food Preparation Scale determined the frequency of household involvement in detailed aspects of food preparation, such as preparing food for cooking, setting the table, and storing left-overs. Participants used a 5-point Likert scale that ranged from 'never' to 'always' to communicate the frequency of these behaviors. Four additional items were included in the CSA-member survey to determine if individuals ate or served their family a greater amount and variety of produce as a result of joining the CSA. These items helped gauge whether participants felt a direct impact in the quantity and variety of produce consumed as a result of membership in the program. These items were borrowed from the Goland survey and altered to reflect the changes in the individual respondent and the respondent's family (28). A final item in this section and asked only of CSA members assessed the value placed on CSA produce versus produce bought in a grocery store. Individuals were asked which of the two kinds they made more of an effort to use for meals or snacks.

Both surveys included questions asking about participants' perceptions of their own diets, whether they were dieting for weight loss, and whether they were using supplements, Studies have indicated that perceptions of health are strongly linked to actual health (57). Therefore, in order to gauge individuals' perceptions regarding diet, one survey item asked participants to rank how healthy their overall diet was. This item was taken from the National Health and Nutrition Examination Survey (NHANES) 2009 (56). Individuals who reported currently dieting for weight loss were asked whether or not their involvement in the CSA program played a role in this. This question was only included in the CSA member survey and not the control survey. All participants were asked to list the supplements taken if they answered 'yes' to the use of supplements.

Both versions of the survey concluded with basic demographic questions including participant age, gender, education, race, ethnicity, and annual income for the household. These items were taken from the U.S. Census Bureau's 2010 survey (58). Participants were also asked to self-report their height in feet and inches and weight in pounds, which were used to calculate Body Mass Index (BMI). Finally, participants were asked to identify themselves or another as the primary food purchaser and preparer for their household.

Statistical Analysis

Data from the online surveys were entered into Microsoft Office Excel for Mac, 2008 edition, by the research investigator and checked for

errors. The cleaned dataset was then transferred to a statistical software package, the Predictive Analytics Software (PASW) version 17.0 (Chicago, IL). All subsequent analyses were conducted using PASW.

Descriptive statistics were conducted on all socio-demographic and CSA member characteristic items included in the survey. Demographic data from CSA members and controls were compared using an independent t-test in the case of continuous variables or chi-square analysis in the case of categorical variables. Mann-Whitney was used in place of an independent t-test if a normal data distribution could not be attained. Chi-square was still used for any categorical variables that were not normally distributed.

Independent t-tests or chi-square analyses were used to evaluate each survey variable individually or as part of a compiled scale. An independent t-test was used to compare the scores of the NEP scale between CSA members and nonmembers. Items related to eating out behaviors (namely, times eaten out in an average week, the total money spent eating out for an entire week, and the total money spent each time the individual ate out), were analyzed using an independent t-test or Mann-Whitney if a normal distribution was not achieved. Items relating to the number of times eaten at specified eating establishments were compared using independent t-tests, both individually and as a total scale using a summed score. Items assessing ecologically friendly behaviors were compared between groups using frequencies and chi-square analysis. Items used to test family involvement in food preparation were also

analyzed on both an individual item basis and as a compiled scale using chi-square.

Items from four scales, including 15 NEP items, 5 Eco-Friendly Behaviors items, 6 Food Establishment Frequency items, and 6 Family Food Preparation items, were subjected to principal component analysis (PCA) to test for unidimensionality. Each scale was analyzed independently. PCA analysis was used assess the correlation and commonality among scale items. Items with common relationships could then be categorized into factors and named according to their overall theme (59). Any missing data from these scales were excluded pairwise. The factorability of the items from each scale was evaluated using Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy and Bartlett's test of sphericity. Analyses that resulted in KMO values greater than 0.6 and a significant Bartlett's test of sphericity were considered to be evidence of factorability (21).

An oblimin rotation, the standard rotation in which the factors can be correlated, was run for further clarification of the components. Resulting eingenvalues greater than one – the total variance explained by each component – and the scree plot patterns were used to assess the number of factors to use in the rotation analysis. Items were considered to correlate strongly with a component if the factor loading, a measure of correlation, had an absolute value greater than 0.4. Any items displaying an absolute value below 0.4 on the communalities extraction table were eliminated from the PCA. The pattern matrix was used to determine

emerging themes for all components. These themes were then used to name the factor. Cronbach's α was calculated for the items corresponding to each factor. Absolute values higher than 0.7 were considered to be of appropriate internal consistency (60). Resulting variables from PCA were computed using regression analysis. Variables were then compared between groups using an independent t-test.

CHAPTER 4

RESULTS

Comparing the CSA Member Group and the Control Group

A total of 115 CSA member and 233 nonmember control surveys were collected over the course of four weeks. Table 1 displays the composition of household members in the CSA member group compared to the control group. The number of adults in a CSA member household was significantly higher than in a control household (p=0.003). CSA member households, on average, had 2.30±0.91 adults whereas the control household had, on average, 1.99±0.64 adults. The number of children in a household, however, was 1.5 children for both groups with no statistically significant difference between the groups (p=0.750).

The groups differed on age but not BMI. CSA members were significantly older (41.88±12.58) compared to control participants (33.71±13.87; p=0.000). Sixty-seven percent of control individuals, but only 38.5% of CSA members, were between 18-35 years old. The majority of CSA members (47%) were over 45 years of age whereas only 23% of the control group was in this age group. BMI was not significantly different between the two groups (p=0.707). CSA members and the control group had an average BMI of 23.6 and 23.4, respectively.

Table 2 compares the socio-demographic information reported by CSA members and the control group. The majority of CSA members (80.4%) and control participants (85.9%) were female. The frequency

Table 1
Comparison of household composition among CSA members and a control.

	CSA Members (n = 112)	Control (n = 233)	
	μ	μ	p
Number of adults	2.30±0.91	1.99±0.64	0.003
Number of children	1.52±1.00	1.49±0.94	0.750

distribution in gender between the two groups was not different (p=0.212). Groups did not differ on race (p=0.700) or ethnicity (p=0.508) either. Of all demographic data reported, significant differences between the CSA member and control group were seen in education (p=0.002) and income (p=0.018). The frequency distribution revealed that CSA members were more likely to attain degrees beyond an associate's degree compared to the control group. Eighty-nine percent of CSA members had completed a bachelor's, graduate, or professional degree compared to 68% of the control group. After no difference was found among multiple income categories between groups, income was collapsed into two categories: those who earned $59,999 or less and those who earned over $60,000. A greater proportion of CSA members (74%) were in the higher income category compared to nonmember controls (60%; p = 0.018).

CSA members reported being either the primary food purchaser or primary food preparer significantly more often compared to control participants (p=0.000). Of the CSA members surveyed, 69.2% reported

being the primary food purchaser compared to 55.2% of the control group. Three-quarters (75.7%) of CSA members identified themselves as the primary food preparer compared to 58.3% of control individuals.

Table 2
Comparison of the socio-demographic profile of CSA members and a control.

	CSA Members (n = 115)		Control (n = 233)			
	n	%	*n*	%	χ^2	*p*
Gender					1.560	0.212
Male	20	19.6	29	14.1		
Female	82	80.4	177	85.9		
Age group					24.038	0.000
18-35 years	40	38.5	138	67.0		
36-45 years	15	14.4	21	10.2		
Over 45 years	49	47.1	47	22.8		
Hispanic Origin					2.323	0.508
Not Hispanic	94	92.2	185	90.7		
Mexican	4	3.9	13	6.4		
Other Hispanic Origin	4	4.0	6	3.0		
Race					2.997	0.700
African American/Black	1	1.0	1	0.5		
White	99	95.2	187	92.6		
Asian	2	1.9	6	3.0		
American Indian or other American Native	0	0.0	5	2.5		
Other	2	1.9	3	1.5		
Education					21.438	0.002
High School Graduate	2	1.9	4	1.9		
Some college, no degree	7	6.7	37	18.0		
Associate's Degree	3	2.9	25	12.1		
Bachelor's Degree	40	38.5	75	36.4		
Master's Degree	34	32.7	46	22.3		
Professional School Degree	5	4.8	2	1.0		
Doctoral Degree	13	12.5	17	8.3		
Income					5.574	0.018
$59,999 or less	26	26.0	67	40.0		
$60,000 or higher	75	74.0	101	60.0		

Table 3
Comparison of food purchasing and food preparation responsibilities as reported by CSA members and a control.

	CSA Members (n = 115)		Control (n = 233)			
	n	%	n	%	χ^2	p
Food Purchasing					19.569	0.000
Primarily done by respondent	74	69.2	117	55.2		
Primarily done by other household member	7	20.3	43	20.3		
Evenly split among household members	26	24.3	52	24.5		
Food Preparation					15.468	0.000
Primarily done by respondent	81	75.7	123	58.3		
Primarily done by other household member	5	4.7	44	20.9		
Evenly split among household members	21	19.6	44	20.9		

Characterizing the CSA Member Group

The frequency distributions regarding CSA membership characteristics are displayed on Table 4. Reported CSA membership length was evenly distributed across respondents. A majority of CSA members (76.5%) reported that they did not split the cost of the share. The majority of members (67.5%) also reported an increase in the amount of fruits and vegetables consumed. A larger majority (92.1%) noted an increase in the variety of fruits and vegetables consumed as well. Similar results were found regarding an increase in the amount and variety of fruits and vegetables consumed among respondents' families (62.0% and 88.9%,

respectively). Finally, 54.8% of CSA members identified CSA membership as an important part of weight loss strategies they employed.

Table 4
Characteristics of CSA membership.

	CSA Member n = 115			
	n	%	χ^2	*p*
Length of membership			43.443	0.000
Less than one month	9	7.8		
1 - 4 months	31	27.0		
5 - 8 months	16	13.9		
9 - 11 months	11	9.5		
1 - 3 years	32	27.8		
3 - 5 years	12	10.4		
Over 5 years	4	3.5		
Division of cost with non-household members			32.357	0.000
Divided	27	23.5		
Not divided	88	76.5		

The New Ecological Paradigm Scale

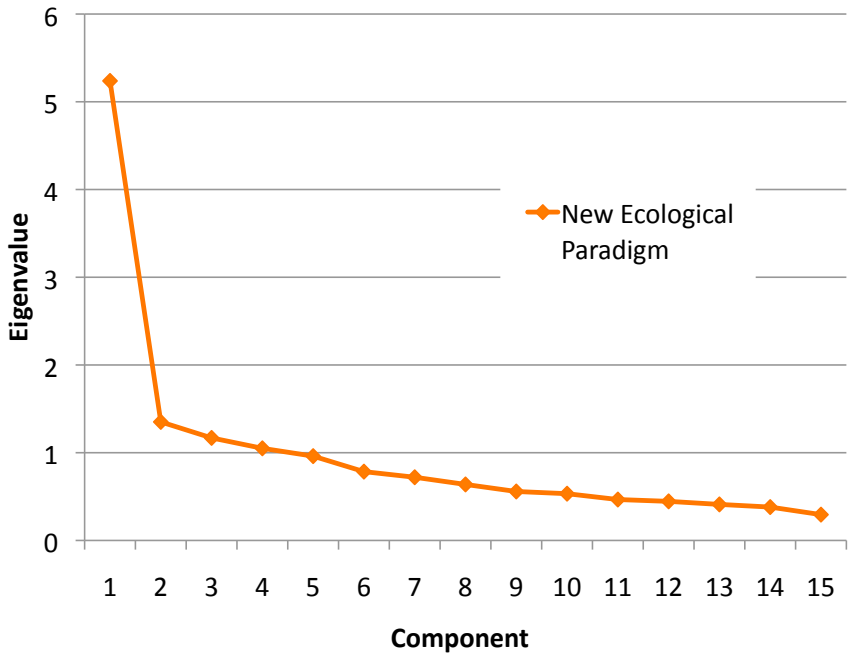
PCA was run on the NEP 15-item scale after assessing its suitability for this type of analysis. Though the NEP is a validated scale, it can act differently when placed in varying contexts. Therefore, to assess the ability of the NEP to measure a single construct in the context of this survey, PCA was performed on the scale. Inspection of the correlation matrix revealed many coefficients of 0.3 and above. Furthermore, both the KMO value

(0.883) and Bartlett's Test of Sphericity (p=0.000) confirmed that factor analysis was appropriate. Eigenvalue and scree plot data revealed that one component was suitable for creating a new variable. Four components had eigenvalues above the recommended value of 1.0. However, the dramatic decrease in eigenvalue (an eigenvalue of 5.2 to 1.3), as displayed by the scree plot, and the percent variance explained (34.9% of variance explained to 9.0%) from component 1 to 2 indicated that a one-component solution was most appropriate for PCA. These results are displayed in Figure 1 and Table 8.

An oblimin rotation was performed to aid in the interpretation of this component. Variable loading with absolute values equal to or greater than 0.4 were considered strong. All items loaded at 0.4 or above on one component. As a result, analysis proceeded with only one component, dubbed "Ecological Sensitivity." This component contained all 15 original items from the NEP scale. The Cronbach α coefficient was high for the NEP scale (0.859), indicating a strong internal consistency among the items.

An independent t-test comparing "Ecological Sensitivity" between the CSA and control groups revealed that CSA members had a significantly higher mean and thus were more ecologically sensitive than the control group (p=0.002). CSA members' total score was 56.41 ± 8.36 compared to 52.97 ± 8.90 among non-member controls.

Figure 1
Scree plot for New Ecological Paradigm scale



Eating Out Behaviors and the Food Establishment Frequency Scale

A comparison of eating out behaviors between CSA members and the control group is displayed on Table 5. The number of times eaten out per week was not significantly different between CSA members and control participants (p=0.227). On average, participants in both the CSA member group and control group reported eating out roughly 3 times per week. Regardless of CSA membership status, individuals did differ on number of times eaten out by income category (p=0.007). A significant difference (p=0.000) did exist between groups in total money spent eating out in an average week ($43.84±37.18 among CSA members compared to 32.10±30.81 among nonmembers; p=0.000). That difference remained even after controlling for income (p=0.023). Lastly, total money spent

each time an individual ate out was also significantly different between groups (p=0.000). CSA members reported spending, on average, $16.33±12.14 compared to $11.65±8.97 among control participants. Again, when controlling for income, the difference remained (p=0.015).

When comparing frequency of eating at individual food establishments between groups, differences were noted in the frequency of eating at a cafeteria (p=0.000), eating food delivered to the home (p=0.000), and eating prepared meals from grocery stores (p=0.000). CSA members ate at a sit-down restaurant, on average, 1.39±1.24 times over the previous week compared to the control group, which averaged 1.12±1.34 times per week. CSA members had eaten, on average, 4.15±1.02 times at a cafeteria whereas the control group had an average of 0.52±1.43 times. CSA members had ordered delivery food an average of 3.60±0.72 times in the past seven days compared to an average of 0.13±0.425 times by control individuals. The mean for purchasing prepared meals from a grocery store was 5.8 times and 0.4 times for CSA members and the control group, respectively. The only eating establishment visited more often by the control group was convenience stores. Control individuals purchased snacks or drinks from convenience stores 0.7 times per week compared to CSA members who only made a convenience store purchase 0.5 times in the past seven days.

Table 5
Comparison of eating out tendencies among CSA members and a control.

	CSA Members (n = 112)	Control (n = 233)	
	μ	μ	p
Total times eaten out in one week	2.96±2.036	2.95±2.629	0.227
Total money spent on eating out in one week	43.84±37.177	32.10±30.814	0.000
Total money spent each time eaten out	16.33±12.143	11.65±8.969	0.000
Times food establishment visited in past 7 days			
Fast food restaurant	0.30±0.569	0.57±1.190	0.112
Drive thru	0.57±0.985	0.53±1.041	0.613
Sit-down restaurant	1.39±1.237	1.12±1.336	0.010
Cafeteria	4.15±1.016	0.52±1.426	0.000
Delivery food	3.60±0.715	0.13±0.425	0.000
Prepared meals from grocery store	3.16±0.742	0.38±0.870	0.000
Snacks/drinks from convenience store	0.45±0.986	0.69±1.197	0.020
Vending machine	0.09±0.424	0.15±0.448	0.113
Total	3.12±1.936	4.06±3.559	0.245

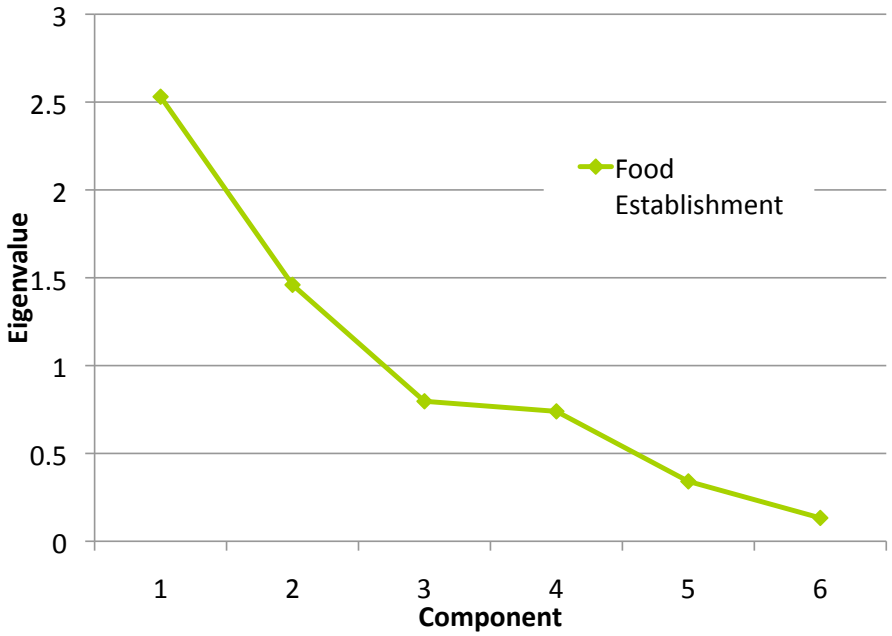
PCA was run on the Food Establishment Frequency items. The initial results of the PCA showed that two items did not load well on emergent factors, including the item related to 'frequency of eating at sit-down restaurants' and the item related to 'purchasing foods from vending machines' (communality extraction values of 0.028 and 0.106, respectively). After eliminating these two items, the correlation matrix displayed many coefficients above 0.3. Furthermore, a KMO value of 0.673 and a significant Bartlett's test of sphericity indicated that the data were

factorable. Components one and two had eigenvalues above 1.0 and explained 42.2% and 24.3% of the variance, respectively (Table 8). The scree plot pattern showed a clear elbow with two components existing above it (Figure 2).

An oblimin rotation was conducted for the interpretation of these components. The pattern matrix clearly revealed two components on which items loaded strongly (above 0.4). The two themes were classified as "Meal-Based Eating" and "Food on the Go." "Meal-Based Eating" included food for delivery, prepared meals from a grocery store, and cafeteria food. These were considered sources of meals during which one would sit down to eat. In contrast, "Food on the Go" consisted of foods purchased at drive-through establishments, convenience store foods, and fast foods. These were considered foods or snacks one might consume when rushed and not necessarily sitting down to eat. The Cronbach α coefficient for internal consistency was high for "Meal-Based Eating" (0.885) and weak for "Food on the Go" (0.464).

Independent t-tests were used to compare groups on both factors. CSA members frequented "Meal-Based" food venues significantly more often (1.36 ± 0.33) than nonmember controls (0.65 ± 0.35; $p=0.000$). This result remained significant even after controlling for income ($p=0.000$). Although control members visited "Food on the Go" restaurants more often than CSA members, this difference was not statistically significant ($p=0.163$).

Figure 2
Scree plot for Food Establishment Frequency scale



Composting and the Eco-Friendly Behaviors Scale

CSA members composted significantly more often than nonmember controls (p=0.000). Nearly a third of CSA members (34.5%) 'always' composted compared to 7.5% of control participants. In addition, 46% of control participants reported 'never' composting compared to 36.4% of CSA members. No significant difference was found in the reported percent edible produce thrown out between the CSA member group and control group (p=0.376). However, groups differed significantly on the reported percent of both edible and non-edible portions of food composted (p=0.000). Composting zero to 9% of produce was reported by 83.6% of control members and 56.3% of CSA members. Conversely, 14.6% of CSA

members reported composting over 70% of their unused produce compared to 5.5% of control group individuals.

The frequency at which CSA members and control individuals reported engaging in environmentally friendly behaviors is shown on Table 6. CSA members purchased produce with as little packaging as possible significantly more often than the control group (p=0.020). Usually' or 'always' purchasing produce with little packaging was reported by 72.7% of CSA members compared to 63.4% of control individuals. Significantly more CSA members also used a personal bag when shopping (p=0.000). Seventy-five percent of CSA members said that they 'usually' or 'always' used their own bag versus 54.0% of control individuals. A significant difference was found when participants were asked how often they bought reusable, rather than disposable, products (p=0.000). Roughly three quarters (77%) of CSA members reported buying reusable products 'usually' or 'always' compared to 59.7% of control members. Recycling at home also differed significantly between groups (p=0.000). Ninety percent of CSA members reported 'usually' or 'always' recycling at home versus 78.9% of control individuals. Finally, no difference was noted between groups regarding recycling away from home (p=0.370).

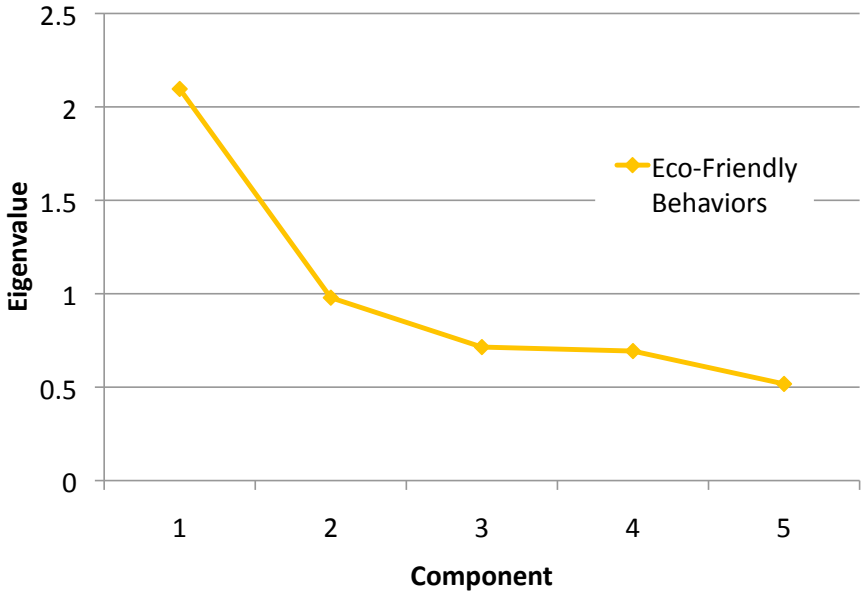
Table 6
Frequency of environmentally friendly behaviors among CSA members and a control.

	Never or rarely				Usually or always				Unavailable					
	CSA		Control		CSA		Control		CSA		Control			
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	χ^2	*p*
Little packaging[a]	2	1.8	18	8.5	80	72.7	135	63.4	--	--	--	--	5.963	0.015
Personal bag	8	7.2	53	24.9	83	75.5	125	54.0	--	--	--	--	15.122	0.000
Reusable products	6	5.5	14	6.6	84	77.0	126	59.7	--	--	--	--	0.767	0.381
Compost at home	43	39.1	120	56.3	43	39.0	24	11.3	18	16.4	52	24.4	33.184	0.000
Recycle at home	4	3.6	13	6.1	99	90.0	168	78.9	5	4.5	15	7.0	2.317	0.314
Recycle in public	4	3.6	11	5.2	91	82.7	154	71.3	3	2.7	7	3.3	0.849	0.654

PCA was also run on the Eco-friendly Behaviors scale. The initial factor analysis revealed that the composting frequency item loaded poorly and thus was dropped from further analyses (communality extraction value =0.077). After eliminating this variable, the correlation matrix displayed many coefficients at or above 0.3. The KMO value (0.702) and Bartlett's test of sphericity (p=0.000) indicated that PCA was appropriate. Only one component had an eigenvalue above 1.0 (2.096) and explained 41.9% of the variance (Table 8). The scree plot clearly indicated that one component was a suitable solution (Figure 3). An oblimin rotation was, once again, used to help interpret this component. All variables loaded very strongly on the single component. PCA analysis, therefore, indicated that one component was appropriate for these data. The component was classified as "Eco-friendly Behaviors" given the theme of the items in the original scale. The Cronbach α coefficient suggested modest internal consistency among these items (0.631).

An independent t-test revealed a statistically significant higher mean value in eco-friendly behaviors for CSA members compared to the control group (p=0.000). This indicated that CSA members were more likely to take part in eco-friendly behaviors than the control group.

Figure 3
Scree plot for Eco-Friendly Behaviors scale



The Family Food Preparation Scale

Items that made up the Family Food Preparation Scale were tested both singly and together using a combined item score. No differences between groups were found when comparing frequency of participation in each individual task (Table 7). Comparing a summed score across items yielded no differences between the CSA member group and control group either (p=0.611).

PCA was run on all Family Food Preparation scale items. The correlation matrix revealed many coefficients greater than 0.4 indicating that the data were suitable for factor analysis. The KMO value (0.777) and Bartlett's test of sphericity (p=0.000) further validated the decision to proceed with PCA. The initial extraction revealed two components with eigenvalues above 1.0 (3.618 and 1.106). Component 1 explained 60.3% of the variance and component 2 explained 18.4% of the variance (Table 8). The scree plot was less clear in this case, indicating that either one or two components would be appropriate (Figure 4).

Table 7
Frequency of food preparation participation among household members in CSA member and control households.

	Never or rarely				Sometimes				Usually or Always					
	CSA		Control		CSA		Control		CSA		Control			
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	χ^2	*p*
Deciding on dishes	22	23.9	42	23.2	37	40.2	59	32.6	33	35.8	80	44.2	3.199	0.525
Prepping food	27	29.4	61	33.7	36	39.1	56	30.9	29	31.5	64	35.4	4.212	0.378
Cooking food	26	28.6	58	32.2	37	40.2	57	31.7	29	29.8	65	36.2	3.209	0.524
Setting table	19	20.6	59	32.6	24	26.1	39	21.5	49	8.7	83	45.8	5.985	0.200
Clean up	13	14.1	38	21.0	21	22.8	48	26.5	58	63.0	95	52.5	3.231	0.520
Storing left-overs	20	21.7	45	25.2	22	23.9	56	31.3	50	54.4	78	43.6	3.706	0.447

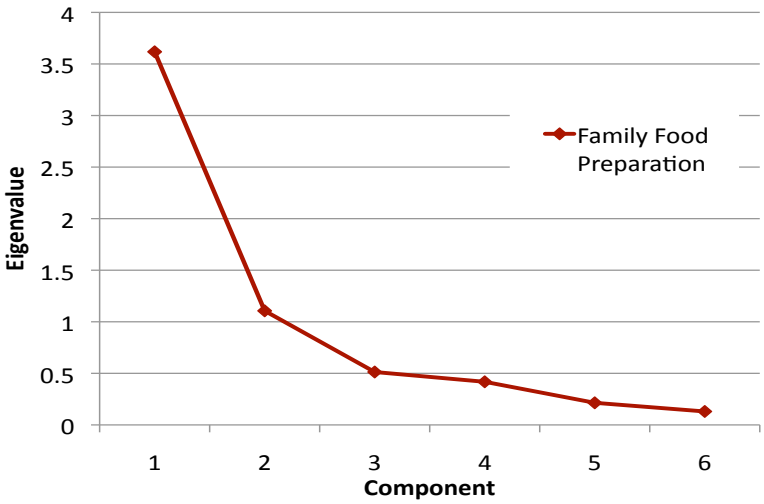
An oblimin rotation was performed to further analyze these components. The pattern matrix displayed strong variable loading (above 0.4) equally on two components. As a consequence, a two-component solution was used. The first component was classified as "Direct Food Preparation" and included the items directly related to the preparation of

food: deciding on what dished to prepare, preparing food to be cooked, and cooking food. The second component was classified as “Indirect Food Preparation” and was related to tasks not directly related to the preparation of food. This variable included the remaining items: helping set the table, cleaning up after dinner, and storing leftover foods. Cronbach α coefficients for internal consistency were high for both “Direct Food Preparation” (0.887) and “Indirect Food Preparation” (0.827), indicating strong internal consistency for both components. Independent t-test analysis revealed no differences between CSA members and the control group for “Direct Food Preparation” or “Indirect Food Preparation” (p=0.531 and p=0.082, respectively).

Table 8
Initial eigenvalues, percentage of variance, and Cronbach α for NEP, food establishment frequency, eco-friendly behaviors, and family food preparation

	Eigenvalue	Cumulative Percentage of Variance	Cronbach α
New ecological paradigm			
Ecological sensitivity	5.238	34.9	0.859
Food establishment frequency			
Meal-based eating	2.530	42.2	0.885
On the go food	1.460	66.5	0.464
Eco-friendly behaviors			
Eco-friendly behaviors	2.096	41.9	0.631
Family food preparation			
Direct food preparation	3.618	60.3	0.887
Indirect food preparation	1.106	78.7	0.827

Figure 4
Scree plot for Family Food Preparation scale



CHAPTER 5

DISCUSSION

Results from this study reflect those found in other research focusing on CSA membership. In our study, compared to nonmember controls, CSA members were older, had attained a higher degree in education, and had a higher income. Education level was consistently higher among CSA members in other studies and, according to one investigation, predicted the likelihood of membership (8, 11, 12, 16, 38). Our data showed that 89% of CSA members had completed at least a bachelor's degree and 50% of CSA respondents had a graduate or professional degree. Other investigations have also reported that the majority of CSA members studied have completed at least some graduate work (9, 10). Our results were also in agreement with a slight majority of studies showing that CSA members generally are of higher income (8, 11, 16, 32). This result is not always consistent in the literature, however, as other studies have found either no distinct income pattern or a lower earning bracket for CSA shareholders (28, 38).

Other demographic characteristics and food behaviors were found to be similar as well. The majority (80.6%) of CSA members in this study were female and identified as non-Hispanic and white, two consistent findings in the current literature (8, 16). In an assessment of southeastern American CSAs, for example, researchers noted a strikingly similar percentage of female CSA members compared to our sample (84.6%) (43). Some research suggests that women more often participate in CSAs based

on the tendency of food shopping to be taken up by the woman in the household (44). This tendency was also supported by our data: the majority of respondents reported being the primary food shopper and food preparer. Finally, the majority of CSA members reported an increase in the amount and variety of fruits and vegetables they ate and served their families as a result of membership. This was reflective of other research noting that 79% of members reported an increase in quantity and variety of fruits and vegetables as a consequence of CSA membership (8). Russell and colleagues also found a shift from meat consumption towards more vegetable consumption among individuals participating in a CSA (16).

Numerous studies have considered motivations and barriers to join and remain in a CSA program. To date, however, research focusing on the behavioral distinctions of individuals who actively participate in a CSA program compared to those who do not is scant. The current study addressed this gap in the literature by assessing whether attitudinal and behavioral differences existed between CSA members and nonmember controls. An important attitudinal comparison was conducted using the NEP scale. Key behaviors investigated included composting frequency, eating out frequency, and family involvement in food preparation. This research project was the first step in assessing whether CSA membership might influence ecological attitudes and food-related behaviors by first investigating potential differences between CSA members and nonmembers on these attitudes and behaviors.

As predicted, CSA members, on average, scored higher than the control group on the NEP. The NEP score is a reflection of an individual's "primitive beliefs" about humanity's relationship with the nature (54). These primitive beliefs form the fundamental components of an individual's belief system regarding the environment (61). Although the NEP scale cannot measure ecologically sensitive behavioral outcomes, many studies have found that higher NEP scores led to an increased likelihood of behavioral intention and self-reported and observed ecologically oriented behaviors (62-64). CSA membership itself can be looked at as an ecologically friendly behavior. Several studies report that an important reason for joining a CSA program is to obtain organic and local produce, both of which are often perceived to be more environmentally sustainable than conventionally grown produce (8-10, 28, 32, 38-40). Based on the predictive validity of the NEP scale, one would suspect that CSA members would be more likely to participate in other eco-friendly behaviors compared to the control group as well.

However, the potential of a CSA program to cause increased ecological sensitivity, and thus an increased NEP score, cannot be discerned from these data alone. From previous studies, it can be inferred that individuals that are 'eco-friendlier' would be more likely to join a CSA program and continue membership. Participants in previous studies most often identified environmental concern as an important motivating factor for joining a CSA or remaining a shareholder (9-11, 22). In a survey examining three CSAs in central Illinois and four in New Hampshire, a

significant correlation was found between an individual's motivation for joining a CSA program and environmental values (11). In a survey of CSA members in Vermont, Kolodinsky and Pelch found that food shoppers who bought organic foods and felt that political, economic, and social factors were most important in choosing a winter produce shopping venue were 15% more likely to be CSA members (12). Nevertheless, CSA membership may still have some influence on an individual's ecological sensitivity. CSA members have reported increased awareness of agricultural and environmental issues and are more active regarding agricultural issues (8). Sixty-one percent of members of a Wisconsin CSA admitted seasonality, a related environmental concern, had become an important factor in their continued membership since initiating their participation in the program (16). Also, environmental issues, which initially ranked low in motivations to join a CSA, became significant to those members who were more likely to rejoin the following season, indicating an increase in ecological sensitivity for some members (28). It is probable that individuals come into a CSA program with varying degrees of environmental consciousness and those with less awareness may be influenced to become more eco-sensitive.

As was predicted, CSA members composted at a higher frequency and composted a higher percentage of produce than the control group. These results were not surprising given the strong NEP scores among CSA members. Some research suggests the increased occurrence of composting among CSA members could be attributed to the CSA itself or to other

related behaviors. Two studies noted a high percentage (50-75%) of CSA members who partook in vegetable or flower gardening at home (9, 10). Gardening could be an important motivator to compost, especially for those interested in oganic-style gardening. Another study noted that 50% of CSA members surveyed composted unused share produce at least once during the season (28). In this case, the extra produce and interest in avoiding waste could be driving the behavior.

CSA members more often engaged in other eco-friendly behaviors as well. The Eco-Friendly Behaviors scale indicated that CSA members were more likely to engage in pro-ecological activities in general than the control group. Whether this increased involvement could be attributed to CSA membership remains an unanswered question. Increased awareness of ecological issues and increased involvement in ecological activities as a result of CSA membership has been noted in the past (8). However, the question of whether attitudes and behaviors existed prior to CSA involvement, or whether CSA membership elicited new attitudes and behaviors (or strengthened them), still must be addressed.

Eating-out patterns in CSA members have not been extensively studied. Only a small amount of data suggest that CSA members eat out less often, but prior to this study, direct comparisons with a control group had not been conducted (8, 16). This study compared CSA members with nonmember controls on these behaviors. However, results did not support the original hypothesis that CSA members would eat out less often, spend less money at each instance of eating out, or spend less

money on food away from the home across the entire week. Instead, frequency of eating out differed based on income alone, suggesting that the number of times eaten out may change based on an individual's income rather than CSA membership status. This could be the case for multiple reasons. For instance, individuals who earn higher incomes have more money to spend on food away from the home. Also, they might work longer hours and therefore rely on restaurants for meals more often. Differences were noted between CSA members and nonmembers on money spent per meal and across the week. In these cases, differences were noted by income category; however, controlling for income did not impact the difference seen between groups. As such, the money spent on eating out in one week, measured in total amount and per meal, can fluctuate depending on how much an individual earns and CSA membership. The increased amount CSA members spent could be attributed to the types of eating establishments they frequented. The "Meal-Based" variable consisted of food for delivery, prepared grocery meals, and cafeteria food. "Meal Based" eating was significantly higher for CSA members. Income also was significant for this variable. The "Food on the Go" variable, in contrast, included drive-through food, convenience store food, and fast food. "Meal-Based" foods are typically more expensive that "Food on the Go" choices. Therefore, the increased amount of money spent was most likely due to the more expensive food choices.

Changes in family eating habits and preferences based on CSA membership have been reported in various studies. Participants of Project

Green Leaf, a CSA based in central North Carolina, reported buying additional produce beyond what they received in their CSA share because their families liked the items so much (17). In addition, families began having "meal rituals" (such as Saturday morning pancakes with eggs), and parents noted that their children voluntarily increased their intake of CSA produce (17). Members have also reported eating at home more and eating out less often, cooking differently, and eating better quality food as a consequence of CSA membership (8). Research among CSAs in California showed that 81% of members reported some sort of change in eating habits as well (8). And in another study, investigators concluded that members perceived value from consuming meals at home using CSA items (65). Research from a Wisconsin CSA provided similar results. In that study, 52% of participants said they experienced a habit change in food preparation such as meal planning around CSA produce, changing the way they cooked, becoming more involved in food preparation, and trying new foods (16). Researchers suggested the possibility that some of the results found among families participating in the study, such as increased interest in the produce received from the CSA, increased willingness to taste the produce, eating at home more often, and other changes in eating habits could lead to more involvement in food preparation. However, this was not evident from the data collected in the current study: participants' family involvement in food preparation did not differ significantly between the CSA member group and the control group.

CHAPTER 6

CONCLUSION

In summary, the results of this research supported the first proposed hypothesis. CSA members demonstrated more ecologically sensitive attitudes, scoring higher on the NEP scale compared to nonmember controls. Data did not support the second proposed hypothesis, that CSA participants eat away from home less often and spend significantly less on eating out. No significant difference was seen in eating out frequency between the two groups. However, when controlling for income, it was noted that income rather than CSA membership was an important factor. CSA members did spend significantly more money eating out compared to the control group. That result remained significant even when controlling for income; however, a difference was also noted on this variable between income brackets. CSA members did compost significantly more often and composted more of their produce than the control group, supporting our third hypothesis. Furthermore, CSA members were more likely to engage in pro-ecological activities compared to the control group, such as recycling. The final hypothesis, that family members of CSA participants are involved in food preparation and decision-making more often, was not supported by the data. There was no significant difference in food preparation involvement when comparing CSA families to non-CSA families.

Based on the conclusions of this study, future research should be designed to assess the impact of CSA participation on ecological attitudes

and behaviors, as well as food-related behaviors, in an experimental setting. Given the regularity of CSA share delivery, the built-in social support of members as well as CSA coordinators, and the potential for multiple perceived benefits of participation (including both ecological and dietary benefits), it is possible that CSAs present an ideal model for nutrition interventions.

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APPENDIX A

CONSENT FORM

Dear Participants:

My name is Lexi MacMillan and I am a graduate student in the Nutrition Program at Arizona State University. Along with Christopher Wharton, PhD, I am conducting a research study to assess eating behaviors and recycling/composting methods among CSA members and others.

I am requesting your participation, which will involve filling out a survey (using the "Next" button below). Filling out the survey should take no more than 15 minutes of your time. Your participation in this study is voluntary. If you choose not to participate or to withdraw at any time, there will be no penalty. You may also skip questions without penalty. You must be 18 years old or older to participate in this survey, and the survey is anonymous. The results of the research study may be used in presentations, reports, and/or published, but your name will not be known. Return of the survey will be considered your consent to participate.

If you complete the questionnaire, your name will be entered in a drawing for a chance to win 1 of 20 Target gift cards in the amount of $10. If you want to be included in the drawing, please enter you name and e-mail address at the end of the survey. Your name and e-mail address will not be linked to the questionnaire responses to maintain confidentiality.

If you have any questions concerning the study, please call me at (602) 300-9784. If you have any questions about your rights as a participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

We greatly value and appreciate your opinion. We hope you will take 10 to 15 minutes to answer these questions.

Thank you!

Lexi MacMillan

Graduate Student, Department of Nutrition

Arizona State University

almacmil@asu.edu

APPENDIX B

CSA MEMBER SURVEY

1. How long have you been a CSA member? (Please include time spent in other CSA's you may have been a member of in the past)
Please select from the drop-down menu.

2. Do you currently divide the cost of a CSA membership with someone that does not live with you?

- yes
- no

3. If you currently share the cost of a CSA membership, with how many households, including your own, is it split?
A household is defined as a family unit or individual who live together and share meals on a regular basis.
Please select from the drop-down menu.

4. Since joining the CSA, I eat...

- A greater AMOUNT fruits and/or vegetables than before
- A lesser AMOUNT fruits and/or vegetables than before
- There is no change in the AMOUNT of fruits and/or vegetables I eat

5. OPTIONAL: If you have any other comments or explanations to add to your answers above, please use the box below.

6. Since joining the CSA, I eat...

- A greater VARIETY of fruits and/or vegetables
- A lesser VARIETY of fruits and/or vegetables
- There is no change in the VARIETY of fruits and/or vegetables I eat

7. OPTIONAL: If you have any other comments or explanations to add to your answers above, please use the box below.

The next two questions ask about foods eaten in your household. By family we are referring to any individuals, other than yourself, who live in your household and eat meals with you on a regular basis. This can include non-related people like boyfriends, girlfriends, roommates, etc.

8. Since joining the CSA, I serve my family...

- A greater AMOUNT fruits and/or vegetables than before
- A lesser AMOUNT fruits and/or vegetables than before
- There is no change in the AMOUNT of fruits and/or vegetables I serve my family

9. OPTIONAL: If you have any other comments or explanations to add to your answers above, please use the box below.

10. Since joining the CSA, I serve my family...

- A greater VARIETY of fruits and/or vegetables
- A lesser VARIETY of fruits and/or vegetables
- There is no change in the VARIETY of fruits and/or vegetables I serve my family

11. OPTIONAL: If you have any other comments or explanations to add to your answers above, please use the box below.

12. Compared to the produce I buy at a grocery store, I...

- make more of an effort to use CSA produce for meals and/or snacks
- make less of an effort to use CSA produce for meals and/or snacks
- there is no difference in how we use CSA produce versus grocery store produce

13. OPTIONAL: If you have any other comments or explanations to add to your answers above, please use the box below.

14. How many adults (18 years or older) currently live in your household (including yourself)?
Please select a number from the drop-down menu.

15. How many children (17 years of age or younger) currently live in your household?
Please select a number from the drop-down menu.

16. Please indicate your level of agreement with the following statements.
Check one box only for each statement please.

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
We are approaching the limit of the number of people the earth can support.					
Humans have the right to modify the natural environment to suit their needs.					
When humans interfere with nature it often produces disastrous consequences.					
Human intelligence and creativity will insure that we do NOT make the earth unlivable.					
Humans are severely abusing the environment.					
The earth has plenty of natural resources if we just learn how to develop them.					
Plants and animals have as much right as humans to exist.					

17. Please indicate your level of agreement with the following statements.
Check one box only for each statement please.

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
The balance of nature is strong enough to cope with the impacts of modern industrial nations.	○	○	○	○	○
Despite our special abilities humans are still subject to the laws of nature.	○	○	○	○	○
The so-called "ecological crisis" facing humankind has been greatly exaggerated.	○	○	○	○	○
The earth is like a spaceship with very limited room and resources.	○	○	○	○	○
Humans were meant to rule over the rest of nature.	○	○	○	○	○
The balance of nature is very delicate and easily upset.	○	○	○	○	○
Humans will eventually learn enough about how nature works to be able to control it.	○	○	○	○	○
If things continue on their present course, we will soon experience a major ecological catastrophe.	○	○	○	○	○

18. How often do you...

	Always	Usually	Sometimes	Rarely	Never
buy produce with as little packaging as possible?	○	○	○	○	○
use your own bag when going shopping?	○	○	○	○	○
buy products that can be used again, rather than disposable items? (ie. reusable water bottles, reusable diapers, etc.)	○	○	○	○	○

19. How often do you...

	Always	Usually	Sometimes	Rarely	Never	This is unavailable to me
compost at home?	○	○	○	○	○	○
recycle at home?	○	○	○	○	○	○
recycle away from home? (ie. at the office, at school, in a public place, etc)	○	○	○	○	○	○

20. OPTIONAL: If you have any other comments or explanations to add to your answers above, please use the box below.

The following two questions ask about any fresh produce that you bring home. This can include produce you get from the CSA, grocery store, farmers' market, grow in your garden, etc.

21. Per week, what percent of edible produce do you throw out?
This does not include the parts of produce that generally cannot be eaten (ie. stems, cores, or peel)
Please select a percentage from the drop-down menu.

22. Per week, about how much produce do you compost?
Please include both the usable and non-usable parts of produce.
Please select a percentage from the drop-down menu.

23. OPTIONAL: If you have any other comments or explanations to add to your answers above, please use the box below.

The following questions regarding eating out behaviors refer to only YOUR behaviors and do not include other family members.

24. In an average week (7 days), how many times do you eat out?
Please include times eaten at any restaurant, cafeteria, at work, at school, or food that was carried out or delivered.
This does not include food prepared at home and eaten at work or school.

25. In an average week (7 days), about how much money TOTAL do you spend on eating out for the ENTIRE WEEK?
Include money spent at any restaurant, cafeteria, at work, at school, on vending machines, or food carried out or delivered.

26. On average, how much money do you spend EACH TIME you eat out?
Include times eaten at any restaurant, cafeteria, at work, at school, or food that was carried out or delivered.

27. Think about the past seven days. How many times have you...

	0	1	2	3	4	5	6	7	more than 7
eaten at a fast food restaurant?	○	○	○	○	○	○	○	○	○
picked up take out or drive thru food?	○	○	○	○	○	○	○	○	○
eaten at a sit-down restaurant?	○	○	○	○	○	○	○	○	○
eaten at a cafeteria?	○	○	○	○	○	○	○	○	○
ordered food for delivery?	○	○	○	○	○	○	○	○	○
picked up prepared meals from a grocery store?	○	○	○	○	○	○	○	○	○
bought snacks/drinks at convenience stores?	○	○	○	○	○	○	○	○	○
purchased foods from a vending machine?	○	○	○	○	○	○	○	○	○

28. Please specify two or three eating establishments you often visit (not just in the past 7 days).
This includes fast food restaurants, sit down restaurants, foods that are delivered, etc.
If the establishment is not well known, please specify the type of food served there.

29. During the past 7 days, how many MORNING or BREAKFAST-TIME meals were prepared, mostly from scratch, at home?
Examples of "mostly from scratch" foods are pancakes from a mix, scrambled eggs, oatmeal.
This does not include milk and box cereal.

30. During the past 7 days, how many MORNING or BREAKFAST-TIME meals did all or most of your household sit down and eat together at home?
Please include all meals (ie. home-made meals, meals picked up or delivered, etc.)

31. During the past 7 days, how many AFTERNOON or LUNCH-TIME meals were prepared, mostly from scratch, at home?
This can include food prepared at home and then taken to school/work.
Examples of "mostly from scratch" foods are a sandwich, a chopped salad, a quiche, etc.

32. During the past 7 days, how many AFTERNOON or LUNCH-TIME meals did all or most of your household sit down and eat together at home?
Please include all meals (ie. home-made meals, meals picked up or delivered, etc.)

33. During the past 7 days, how many EVENING or DINNER-TIME meals were prepared, mostly from scratch, at home?
Examples of "mostly from scratch" foods include a roast, steamed vegetables, cooked potatoes, grilled chicken, etc.

34. During the past 7 days, how many EVENING or DINNER-TIME meals did all or most of your household sit down and eat together at home?
Please include all meals (ie. home-made meals, meals picked up or delivered, etc.)

35. How often do you share any sit-down meals such as breakfast, lunch, or dinner with non-household members (for example neighbors or friends)?
This can include meals eaten at either your home or a non-household member's home. This does not include eating out at restaurants or other eating establishments.

36. On average, how much time is spent preparing food (washing, cooking, etc) for evening or dinner-time meals each night?

37. How often do multiple (more than one) household members participate in the following aspects of food preparation?

	I live alone	Never	Rarely	Sometimes	Usually	Always
deciding on what dishes to prepare	○	○	○	○	○	○
prepping food to be cooked	○	○	○	○	○	○
helping cook food	○	○	○	○	○	○
helping set the table	○	○	○	○	○	○
helping clean up after eating	○	○	○	○	○	○
helping store left-over foods	○	○	○	○	○	○

38. Are you currently dieting for weight loss?

- ○ yes
- ○ no

39. If yes, does your involvement in the CSA play any role in your weight loss strategy?

- ○ yes
- ○ no
- ○ I am currently not dieting for weight loss

40. If yes, how?
If you answered 'no' or 'I am currently not dieting for weight loss' to the previous question please skip this question.

41. Are you currently taking any dietary supplements?
Dietary supplements include a multivitamin, herbal supplements, a single vitamin or mineral supplement, etc.

- ○ yes
- ○ no

42. If yes, please list the types of supplements you are taking.
(ie. multivitamin, ginko biloba, vitamin B complex, calcium, etc.)

43. Are you the primary food purchaser for your household?

- ○ Yes
- ○ No
- ○ Purchasing is evenly split with household member(s)

44. Are you the primary food preparer for your household?

- ○ Yes
- ○ No
- ○ Preparation is evenly split with household member(s)

45. In general, how healthy is your overall diet? Would you say...

- ○ excellent
- ○ very good
- ○ good
- ○ fair
- ○ poor

46. Your age?

47. Your gender?

- ○ Male
- ○ Female

48. Please enter your weight in pounds (lb) using whole units (eg. 170 lb)

49. Please enter your height in feet and inches.

	Feet	Inches
Height		

50. Are you Spanish, Hispanic, or Latino?
Check one of the following.

- ○ No, not Hispanic/Latino/Spanish
- ○ Yes, Mexican, Mexican American, Chicano
- ○ Yes, Puerto Rican
- ○ Yes, Cuban
- ○ Yes, other Hispanic/Latino/Spanish origin

51. Which one or more of the following would you say is your race or ethnicity?
Check all that apply.

- ☐ African American or Black
- ☐ Afro-Caribbean
- ☐ African (continent)
- ☐ White
- ☐ Asian
- ☐ Native Hawaiian of other Pacific Islander
- ☐ American Indian or Alaskan Native
- ☐ Other

52. What is your highest level of education completed?

- ○ 8th grade or below
- ○ 9th grade to 12th grade, No diploma
- ○ High School Graduate
- ○ GED or equivalent
- ○ Some college, no degree
- ○ Associate Degree
- ○ Bachelor's Degree
- ○ Master's Degree
- ○ Professional School Degree
- ○ Doctoral Degree

53. What is the total annual income for your household (including yourself)?

- $20,000 or less
- $20,001 - $39,999
- $40,000 - $59,999
- $60,000 - $79,999
- $80,000 - $99,999
- $100,000 or higher
- Prefer not to answer

APPENDIX C

CONTROL SURVEY

1. How many adults (18 years or older) currently live in your household (including yourself)?

Please select a number from the drop-down menu.

2. How many children (17 years of age or younger) currently live in your household?

Please select a number from the drop-down menu.

3. Please indicate your level of agreement with the following statements. Check one box only for each statement please.

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
We are approaching the limit of the number of people the earth can support.	○	○	○	○	○
Humans have the right to modify the natural environment to suit their needs.	○	○	○	○	○
When humans interfere with nature it often produces disastrous consequences.	○	○	○	○	○
Human intelligence and creativity will insure that we do NOT make the earth unlivable.	○	○	○	○	○
Humans are severely abusing the environment.	○	○	○	○	○
The earth has plenty of natural resources if we just learn how to develop them.	○	○	○	○	○
Plants and animals have as much right as humans to exist.	○	○	○	○	○

4. Please indicate your level of agreement with the following statements. Check one box only for each statement please.

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
The balance of nature is strong enough to cope with the impacts of modern industrial nations.	○	○	○	○	○
Despite our special abilities humans are still subject to the laws of nature.	○	○	○	○	○
The so-called "ecological crisis" facing humankind has been greatly exaggerated.	○	○	○	○	○
The earth is like a spaceship with very limited room and resources.	○	○	○	○	○
Humans were meant to rule over the rest of nature.	○	○	○	○	○
The balance of nature is very delicate and easily upset.	○	○	○	○	○
Humans will eventually learn enough about how nature works to be able to control it.	○	○	○	○	○
If things continue on their present course, we will soon experience a major ecological catastrophe.	○	○	○	○	○

5. How often do you...

	Always	Usually	Sometimes	Rarely	Never
buy produce with as little packaging as possible?	○	○	○	○	○
use your own bag when going shopping?	○	○	○	○	○
buy products that can be used again, rather than disposable items? (ie. reusable water bottles, reusable diapers, etc.)	○	○	○	○	○

6. How often do you...

	Always	Usually	Sometimes	Rarely	Never	This is unavailable to me
compost at home?	○	○	○	○	○	○
recycle at home?	○	○	○	○	○	○
recycle away from home? (ie. at the office, at school, in a public place, etc)	○	○	○	○	○	○

7. OPTIONAL: If you have any other comments or explanations to add to your answers above, please use the box below.

The following two questions ask about any fresh produce that you bring home. This can include produce you get from the grocery store, grow in your garden, etc.

8. Per week, what percent of edible produce do you throw out?
This does not include the parts of produce that generally cannot be eaten (ie. stems, cores, or peel)
Please select a percentage from the drop-down menu.

9. Per week, about how much produce do you compost?
Please include both the usable and non-usable parts of produce.
Please select a percentage from the drop-down menu.

10. OPTIONAL: If you have any other comments or explanations to add to your answers above, please use the box below.

The following questions regarding eating out behaviors refer to only YOUR behaviors and do not include other family members.

11. In an average week (7 days), how many times do you eat out?
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12. In an average week (7 days), about how much money TOTAL do you spend on eating out for the ENTIRE WEEK?
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13. On average, how much money do you spend EACH TIME you eat out?
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14. Think about the past seven days. How many times have you...

	0	1	2	3	4	5	6	7	more than 7
eaten at a fast food restaurant?	○	○	○	○	○	○	○	○	○
picked up take out or drive thru food?	○	○	○	○	○	○	○	○	○
eaten at a sit-down restaurant?	○	○	○	○	○	○	○	○	○
eaten at a cafeteria?	○	○	○	○	○	○	○	○	○
ordered food for delivery?	○	○	○	○	○	○	○	○	○
picked up prepared meals from a grocery store?	○	○	○	○	○	○	○	○	○
bought snacks/drinks at convenience stores?	○	○	○	○	○	○	○	○	○
purchased foods from a vending machine?	○	○	○	○	○	○	○	○	○

15. Please specify two or three eating establishments you often visit (not just in the past 7 days).
This includes fast food restaurants, sit down restaurants, foods that are delivered, etc.
If the establishment is not well known, please specify the type of food served there.

16. During the past 7 days, how many MORNING or BREAKFAST-TIME meals were prepared, mostly from scratch, at home?
Examples of "mostly from scratch" foods are pancakes from a mix, scrambled eggs, oatmeal.
This does not include milk and box cereal.

17. During the past 7 days, how many MORNING or BREAKFAST-TIME meals did all or most of your household sit down and eat together at home?
Please include all meals (ie. home-made meals, meals picked up or delivered, etc.)

18. During the past 7 days, how many AFTERNOON or LUNCH-TIME meals were prepared, mostly from scratch, at home?
This can include food prepared at home and then taken to school/work.
Examples of "mostly from scratch" foods are a sandwich, a chopped salad, a quiche, etc.

19. During the past 7 days, how many AFTERNOON or LUNCH-TIME meals did all or most of your household sit down and eat together at home?
Please include all meals (ie. home-made meals, meals picked up or delivered, etc.)

20. During the past 7 days, how many EVENING or DINNER-TIME meals were prepared, mostly from scratch, at home?
Examples of "mostly from scratch" foods include a roast, steamed vegetables, cooked potatoes, grilled chicken, etc.

21. During the past 7 days, how many EVENING or DINNER-TIME meals did all or most of your household sit down and eat together at home?
Please include all meals (ie. home-made meals, meals picked up or delivered, etc.)

22. How often do you share any sit-down meals such as breakfast, lunch, or dinner with non-household members (for example neighbors or friends)?
This can include meals eaten at either your home or a non-household member's home. This does not include eating out at restaurants or other eating establishments.

23. On average, how much time is spent preparing food (washing, cooking, etc) for evening or dinner-time meals each night?

24. How often do multiple (more than one) household members participate in the following aspects of food preparation?

	I live alone	Never	Rarely	Sometimes	Usually	Always
deciding on what dishes to prepare	○	○	○	○	○	○
prepping food to be cooked	○	○	○	○	○	○
helping cook food	○	○	○	○	○	○
helping set the table	○	○	○	○	○	○
helping clean up after eating	○	○	○	○	○	○
helping store left-over foods	○	○	○	○	○	○

25. Are you currently dieting for weight loss?

○ yes

○ no

26. Are you currently taking any dietary supplements?
Dietary supplements include a multivitamin, herbal supplements, a single vitamin or mineral supplement, etc.

○ yes

○ no

27. If yes, please list the types of supplements you are taking.
(ie. multivitamin, ginko biloba, vitamin B complex, calcium, etc.)

28. Are you the primary food purchaser for your household?

- ○ Yes
- ○ No
- ○ Purchasing is evenly split with household member(s)

29. Are you the primary food preparer for your household?

- ○ Yes
- ○ No
- ○ Preparation is evenly split with household member(s)

30. In general, how healthy is your overall diet? Would you say...

- ○ excellent
- ○ very good
- ○ good
- ○ fair
- ○ poor

31. Your age?

32. Your gender?

- ○ Male
- ○ Female

33. Please enter your weight in pounds (lb) using whole units (eg. 170 lb)

34. Please enter your height in feet and inches.

	Feet	Inches
Height		

35. Are you Spanish, Hispanic, or Latino?
Check one of the following.

- ○ No, not Hispanic/Latino/Spanish
- ○ Yes, Mexican, Mexican American, Chicano
- ○ Yes, Puerto Rican
- ○ Yes, Cuban
- ○ Yes, other Hispanic/Latino/Spanish origin

36. Which one or more of the following would you say is your race or ethnicity?
Check all that apply.

- ☐ African American or Black
- ☐ Afro-Caribbean
- ☐ African (continent)
- ☐ White
- ☐ Asian
- ☐ Native Hawaiian of other Pacific Islander
- ☐ American Indian or Alaskan Native
- ☐ Other

37. What is your highest level of education completed?

- ○ 8th grade or below
- ○ 9th grade to 12th grade, No diploma
- ○ High School Graduate
- ○ GED or equivalent
- ○ Some college, no degree
- ○ Associate Degree
- ○ Bachelor's Degree
- ○ Master's Degree
- ○ Professional School Degree
- ○ Doctoral Degree

38. What is the total annual income for your household (including yourself)?

- $20,000 or less
- $20,001 - $39,999
- $40,000 - $59,999
- $60,000 - $79,999
- $80,000 - $99,999
- $100,000 or higher
- Prefer not to answer