

Public Perceptions of the Food System: Differences across the generations

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Introduction

Public knowledge, attitudes and behaviors are items that sociologists have been interested in for years. These variables can give sociologists a good ideas about how people live and view others in society. Information about attitudes and behaviors can also help understand social conflicts and identify strategies for reducing conflict or social problems arising from conflicting attitudes and behaviors. Society has been changing at a rapid rate due to many factors, including economic, technological and social. Rapid change can cause conflict and resistance to change, and this has been seen in agriculture and the food system. This has become more common as concerns about food safety, the environment, animal welfare and quality of food are on the rise. There is reason to believe that some of these differences in attitude are due to the changing face of agriculture, and society's changing proximity to the industry. For example, older generations may have more experience with agriculture than younger people and would therefore have stronger ties to agriculture. This suggests that age and life course may play a key role in shaping attitudes due to opportunities an individual has to interact with the segment of the population involved in agriculture.

In order to examine the possibility of this connection between age and attitudes towards the food supply and agriculture, it is important to understand the work that has been done in the area of analyzing society's views toward issues such as the environment. Van Liere and Dunlap in 1980 sought to explain the social basis for environmental concern. They looked at several social and demographic variables in relation to environmental concern, finding age, education and political ideology were associated with concern for the environment. This meant that younger, well-educated, liberal individuals

had higher environmental concern than older, less educated and more conservative individuals.

While the social basis of environmental concern has been widely studied and documented in the literature since the groundbreaking work of Dunlap and Van Liere (1980) and other environmental sociologists, attention to the social basis of agricultural attitudes has been less widely and systematically studied. It is important to understand what influences people's attitudes about agricultural issues because individuals are increasingly more removed from the food system as fewer and fewer people are engaged in agricultural production. This is important because consumers may need to be educated on issues concerning the food supply as they have little opportunity to directly experience or learn about farming. Just as important is the need for producers to understand the opinions of their consumers in order to deliver a desirable, valuable product. Food safety concerns and food scares may be lessened through actions taken from knowledge gained in this research. The knowledge may also help to guide communication with individuals to explain certain scientific advancements and to open a dialogue between farmers and consumers. Individuals are gaining more and more responsibility for making decisions that affect the food supply and it is a moral responsibility and an economic benefit for consumers to understand food supply issues. This information can also help consumers avoid misleading information about food choices that may cost them more money. There are many other factors that go into food supply decisions, but consumer knowledge plays an important role. Overall, understanding how people view the food supply will be a benefit for farmers and consumers.

Some recent research has looked at the relationship between agricultural attitudes and physical location along the rural-urban continuum and family linkages to farming (Sharp et al., 2008; Sharp et al., 2009; Smith et al., 2005; Vera-Toscano et al., 2008; Wachenheim et al., 2002). In 2005, Smith et al. looked at possible conflict in an Ohio exurban region due to the mix of newcomers, longtime nonfarm residents and farm households. The findings reported that there were differences in attitudes related to agriculture with farm households being more pro-farming and newcomers and longtime residents having very similar views that were less sympathetic towards farming. These findings suggested that social proximity to agriculture is important in influencing attitudes. Social proximity as well as physical proximity to agriculture was researched by Sharp and Adua in 2009. This study found that social and physical proximity to agriculture plays a role in determining attitudes. Those physically closer and with stronger social ties were more sympathetic towards farming than those who were more removed from agriculture. These findings support results found in the two previous studies by Sharp in 2008 and Wachenheim in 2002 which evaluated similar variables related to agricultural attitudes.

Some practical evidence of how these attitudes play a role in consumer choices is evident in some of the research done on environmental attitudes related to the food supply. These attitudes have inspired action on the part of those with high concern for the environment. This has been seen in the way people view food production. The study by Barber et al. (2009) on knowledge, attitudes and purchasing behaviors of wine consumers showed that those with more environmental knowledge were more likely to pay more for a wine that was produced using “environmentally friendly” practices. Another study done in Washington State found that consumers who are in support of local farms and

environmentally friendly practices are more concerned about buying products produced in an environmentally responsible manner than buying organic products (Selfa et al., 2008). Attitudes toward the food supply also go beyond environmentally friendly practices and encompass other production practices including organic, biotechnology and irradiation as studied by Teisl et al. (2009). This study looked at the problem of finding out from where consumer's attitudes about the food supply come. It was found that demographics played a role in the way each of these practices are viewed. Individual's experiences with each of these types of products also influenced opinions towards them.

Apart from agriculture even, consumer choices are found to be related to demographic and socio-economic factors (Wilcock, Pun, Khanona &Aung, 2004). A similar study by Nayga (1996) showed differences in food choice concerns between based upon gender, residence, income and education level. While all these studies exist which analyze consumer concern about food and agriculture based on many factors, there is little focus on the impact of age on these attitudes about the food supply. This study attempts to shed light on some of the implications of age related to these attitudes.

Three main questions shape the direction of the analysis for this research:

- Is a person's knowledge of the food supply related to age?
- Is age related to food choices?
- Are sources of information about the food supply accessed differently by different age groups?

Based upon the previous findings and some general assumptions about attitudes and age, it was possible to arrive at a number of expectations for this research. It is expected that a relationship between age and consumer perceptions of the food supply

exist. It is known that proximity to agriculture affects attitudes and perceptions, therefore younger consumers are thought to be more removed from the food system. This suggests that younger consumers may consider fewer factors when making consumer choices than older consumers. The same concept applies to younger generations having less personal experience with agriculture. This can have an impact on a number of aspects, including the sources used by these consumers to gain information about the food supply.

Methods

The approach to this research began with a desire to understand consumer perceptions of agriculture related to age. After analyzing many aspects of the data, it was clear that this would most effectively be accomplished by examining attitudes about the food supply based upon the questions posed in the previous section. The data evaluated for this study is taken from the 2002, 2004, 2006 and 2008 Ohio Survey of Food, Agriculture and Environmental Issues conducted by The Ohio State University. The surveys were conducted by mail using Dillman's Tailored Design Method (Smith & Sharp, 2003). The sample was stratified and has been weighted to account for disproportionate sampling of rural and urban respondents. A new sample is drawn each year of the sample, so examination of changes in individual responses across time are not possible.

The analysis was done using descriptive statistics and bivariate analysis. SASS is the statistical analysis package that was used. Age categories were created as follows: 34 years and younger, 35 to 49 years, 50 to 64 years and older than 65. With age being the independent variable, the dependent variables analyzed were current residence, social ties to farming, knowledge of the food supply, health concerns related to food choices, factors affecting food choices, trust of information sources and helpfulness of information sources.

The specific variables for each year differ as not all questions were asked each year, or the wording was changed. For each year the questions were labeled as variables $X_1, X_2, X_3, \dots, X_i$. Using SASS these variables could be selected and analyzed against each other to perform the bivariate analysis.

In order to test whether or not the results found were statistically significant, comparison of means was used as well as F-tests associated with ANOVA and range tests to identify specific differences between groups for the questions that had answers on a spectrum. For questions that had categorical responses, the significance was evaluated using Chi-square test. This let us know whether or not the null hypothesis could be eliminated. Conclusions were then drawn from these results.

The approach taken for this research involved first analyzing all potential data related to the topic of interest for all for years. This was possible with the use of a compiled data set. Comparison of means for each year was calculated using One-way ANOVA or Chi-square test. If a variable showed a significant difference at the 0.05 level, it was evaluated further with post hoc least significant difference tests. These tests allowed us to see which of the variables showed actual trends in the data between the age groups.

In order to present the results of the trends found in the data, cross tabulations were performed. The results of the One-way ANOVA and cross tabulations are displayed in this section. Table 1 shows the questions that were asked exactly as worded for the surveys with the possible responses provided. All possible responses on a range included only whole numbers within the range.

Table 1. Survey questions analyzed for the study

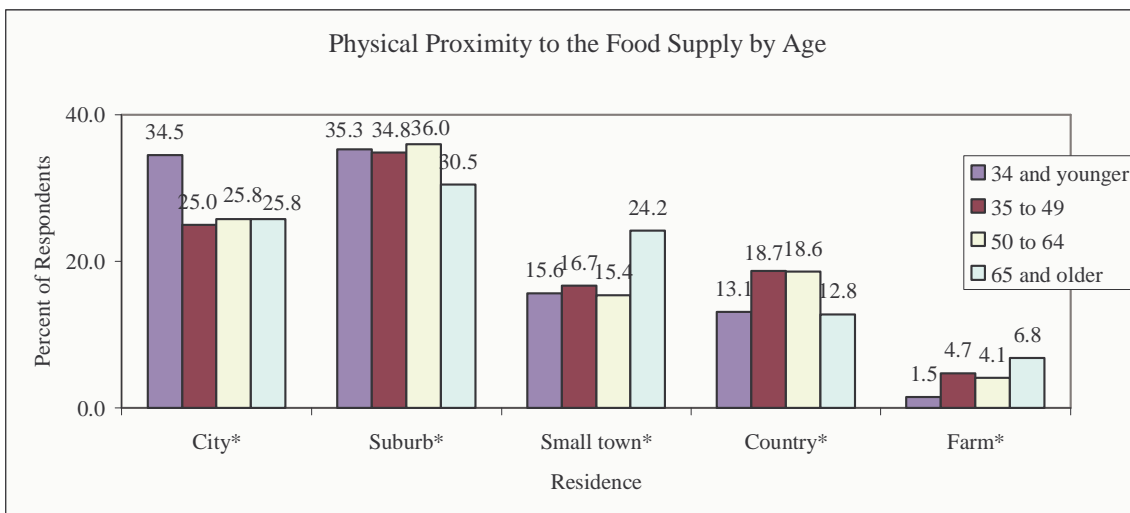
Survey Question	Variables	Possible Responses
Please describe the kind of place in which you currently live.	N/A	1. City 2. Suburb 3. Small town 4. Countryside 5. Farm
Did your parents ever own or operate a farm?	N/A	Yes or No
Did your grandparents ever own or operate a farm?	N/A	Yes or No
Do any of your friends currently own or operate a farm?	N/A	Yes or No
How knowledgeable are you about how or where your food is grown? Please indicate on a scale of 1 to 7, your level of knowledge.	N/A	1. Not at all knowledgeable 4. Somewhat knowledgeable 7. Very Knowledgeable
Please indicate your level of agreement with the following statements related to the food you eat and your health.	I consider myself health conscious I am interested in using food to maintain good health I am interested in using food to prevent disease I am knowledgeable of the health benefits of the food I eat I usually look for health information when I buy food products I am concerned that someone in my household, including myself, might be diagnosed with heart disease	1. Strongly Disagree 2. Disagree 3. Undecided 4. Agree 5. Strongly Agree
Ohioans must consider a number of factors when making food purchases. Please rate on a scale of 1 to 7 the importance of the following factors you may consider when purchasing food.	Taste Nutritional value Added health benefits beyond basic nutrition Price Food product is available where you normally shop Labeled organic Grown locally Grown locally and labeled organic Meat, Poultry or Dairy products from humanely treated animals Grown in the state of Ohio Food purchase will keep a local farmer in business	1. Not important 4. Somewhat important 7. Very important
People may use a variety of information sources about environmental and food safety issues. Please indicate how much you trust the following sources for reliable information about environmental and food safety issues.	University scientist Physician or other health professional Extension educator/agent Friends or family Consumer advocacy group Farmer or grower USDA USEPA USFDA	1. None 2. Low 4. Moderate 5. High
Please tell us how helpful the following media are to you in providing news and information useful in taking care of your family and running your household.	Television news Television talk shows Radio Newspapers World Wide Web Magazines	0. Not helpful 1&2. Slightly helpful 3&4. Moderately helpful 5. Very helpful

Results

As the results were evaluated, not only were there significant differences between the age groups, but there were clear trends as well. It will be seen as the results are discussed and illustrated that the differences between the two middle age groups often were not as significant as the differences between the oldest and youngest age groups. Typically an upward or downward trend was seen from youngest to oldest. If this trend was not seen, it was usually due to little difference at all between the groups.

To begin, it is clear from the results shown in Figure 1 that there is a generational difference in terms of residence from an urban to a rural setting. The figure shows a decreasing percentage of individuals 34 and younger residing in rural areas. Only 1.5 percent of those 34 and younger live on a farm, while that percentage is 34.5 percent in a city. This of course causes an increase in the ratio of older to younger individuals in rural areas as compared to urban areas where the ratio is more equal.

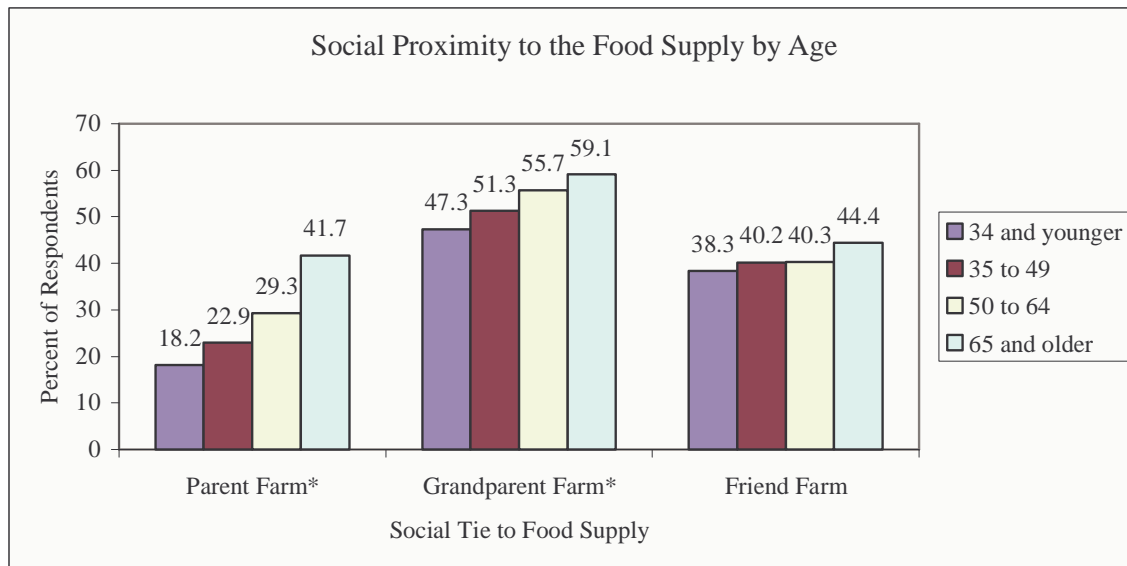
Figure 1



* Chi-square significant at the 0.05 level

In addition to physical proximity, social proximity also shows a trend in the generations. Significant differences were seen in the results for number of individuals with parents or grandparents farming, but the number of individuals who have friends who farm was not significantly different across the generations. As can be seen in Figure 2, the trend is much steeper for those who have parents who farmed with only 18.2 percent of those 34 and younger having a positive response and 41.7 of those 65 and older having parents farm. The difference in percentages from 34 and younger to 65 and older for parents farming is 23.5, while it is only 11.8 for grandparents farming. The percentage of individuals 34 and younger who had grandparents farm is more than double the percentage who had parents farm. This trend reveals a growing separation from agriculture as the generations progress.

Figure 2



* Chi-square significant at the 0.05 level

While the measurements of physical and social proximity show some evidence for differing distances from the food supply across the ages, additional insight can be gained from individuals' self-declared knowledge of the food supply. Results from this question are shown in Figure 3. It can be seen that the mean of the responses of those 34 and younger is well below the means of the other three age groups. The trend then continues with each increasing age group having a higher mean of responses with those two middle groups not being significantly different from each other. Another note about the means is that the mean for those 34 and younger is also below the value of the average response on the survey of four, while the mean for those 65 and older is above this value. These results show that those 65 and older generally consider themselves knowledgeable about from where their food comes, and those 34 and younger do not consider themselves knowledgeable.

Figure 3. Means of responses to level of knowledge of the food supply*

Mean	34 and younger	35 to 49	50 to 64	65 and older	Post Hoc
3.90	3.19	3.92	3.98	4.14	4>2>1; 3>1

* F-test significant at the 0.05 level

Health concerns can play a role in food decisions and perceptions, so it is helpful to gain an understanding of differences in these perceptions in terms of age. The results in Table 2 show a common trend in level of agreement with certain health statements. Those 65 and older consistently exhibited a higher level of agreement than the other age groups, and those 34 and younger showed a trend of having the least level of agreement for each statement. This can be seen by the means of the responses and verified with the Post Hoc

results which show whether the difference was significant between the groups or not. With review of the questions asked and the responses, it can be concluded that those 65 and older have more concern for their health and consider their health in food decisions more than other age groups do.

Table 2. Means of responses to level of agreement with health statements

	Mean	34 and younger	35 to 49	50 to 64	65 and older	Post Hoc
I consider myself health conscious*	3.65	3.47	3.55	3.61	3.99	4>3>2; 3>1
I am interested in using food to maintain good health*	3.98	3.82	3.89	3.97	4.24	4>3>2; 3>1
I am interested in using food to prevent disease*	3.90	3.71	3.82	3.90	4.13	4>3>2; 3>1
I am knowledgeable of the health benefits of the food I eat*	3.73	3.55	3.67	3.68	3.99	4>3>2; 3>1
I usually look for health information when I buy food products*	3.48	3.38	3.39	3.46	3.70	4>3>2
I am concerned that someone in my household, including myself, might be diagnosed with heart disease*	3.64	3.25	3.57	3.70	3.96	4>3>2>1

* F-test significant at the 0.05 level

The next question analyzed was the factors that influence buying decisions of individuals. Table 3 shows the means of the responses for the different factors along with the Post Hoc results. It was found that taste, price and availability were not significantly different in importance across the age groups. The significant differences existed in the other factors with those factors being significantly more important to those 65 and older. In these categories, those 34 and younger reported the least level of importance of the four

age groups. Although those 34 and younger appear to find these factors as less important than those in the older age groups, information about what they do find important can be gained by comparing the means between the factors for the youngest age group. As seen in the table and as stated previously, taste, price and availability were not significantly different across the age groups; however, these factors had the three highest means of all the factors for those 34 and younger. This indicates that taste, price and availability are important to those 34 and younger as well as the other age groups. The differences in the age groups show that those 65 and older consider more factors when buying food than those in the younger age groups.

The next table (Table 4) displays results about which sources of information individuals trust for information on environmental and food safety issues. University scientist and friends or family were two sources that did not show significant differences in trust levels across the age groups. The responses reported show that those 65 and older had a higher level of trust of physicians, extension educators, consumer groups, farmers and the USDA than those 34 and younger. The significance of differences in relationship to the two middle age groups varied among the information sources, but their levels of trust were always less than those 65 and older. The only two sources which show those 34 and younger having a statistically similar level of trust as those 65 and older were the USEPA and USFDA. To summarize these results, physicians and friends or family are similarly trusted by different age groups while those 65 and older are more likely to trust most of the other sources. The only two sources of which those 34 and younger had similar trust levels were the USEPA and USFDA which are both government agencies.

However, those 65 and older still had a higher level of trust for the USDA which is also a government agency.

Table 3. Means of responses for importance of factors in food buying decisions

	Mean	34 and younger	35 to 49	50 to 64	65 and older	Post Hoc
Taste	6.43	6.45	6.47	6.41	6.40	n.d.
Price	5.84	5.87	5.81	5.83	5.86	n.d.
Food product is available where you normally shop	5.82	5.70	5.81	5.85	5.86	n.d.
Nutritional Value*	5.81	5.54	5.74	5.85	6.05	4>3>2>1
Added Health benefits beyond basic nutrition*	5.33	4.99	5.28	5.33	5.65	4>3>2>1
Food purchase will keep a local farmer in business*	5.29	4.86	5.25	5.39	5.53	4>2>1; 3>1
Meat, poultry or dairy products from humanely treated animals*	4.84	4.58	4.61	4.88	5.30	4>3>2>1
Grown in the state of Ohio*	4.39	3.96	4.43	4.35	4.70	4>3>2>1
Grown locally*	4.31	3.88	4.32	4.24	4.71	4>3>2>1
Grown locally and labeled organic*	3.48	3.02	3.46	3.51	3.80	4>3>2>1
Labeled organic*	3.45	2.96	3.40	3.50	3.81	4>3>2>1

* F-test significant at the 0.05 level

Table 4. Means of responses to level of trust of sources for environmental and food safety issues

	Mean	34 and younger	35 to 49	50 to 64	65 and older	Post Hoc
Physician or other health professional*	3.91	3.87	3.87	3.92	3.99	4>21
Farmer or grower*	3.77	3.71	3.73	3.79	3.85	4>21
University Scientist	3.71	3.7	3.68	3.68	3.78	n.d.
USDA*	3.65	3.69	3.56	3.61	3.8	4>321; 1>2
Extension educator/agent*	3.59	3.36	3.53	3.66	3.77	4>3>2>1
USFDA*	3.54	3.66	3.46	3.47	3.64	4>32; 1>32
Friends or family	3.51	3.46	3.53	3.5	3.55	n.d.
USEPA*	3.44	3.58	3.38	3.37	3.5	4>32; 1>32
Consumer advocacy group*	3.25	3.2	3.18	3.28	3.33	4>21; 3>2

* F-test significant at the 0.05 level

The final question analyzed in this study relates to how helpful people view certain media as sources of information to better run their household. No significant differences in the use of newspapers and magazines was found between the ages. Of the other four media, television news and television talk shows were seen as most helpful by those 65 and older. This difference is only significantly higher than those 34 and younger for television talk shows. Radio was viewed as significantly less helpful by those 65 and older than all other age groups. There were consistent difference in the perception of the helpfulness of the World Wide Web between the age groups, with those 34 and younger viewing it as most helpful and each age group after exhibiting significantly less helpfulness

than the previous. These results show a direct trend in where people may tend to go first for information with the younger generations leaning toward greater technology and quicker attainment of information.

Table 5. Means of responses for helpfulness of sources in providing information to run your household

	Mean	34 and younger	35 to 49	50 to 64	65 and older	Post Hoc
Newspapers	3.27	3.25	3.31	3.28	3.21	n.d.
Television news*	3.23	3.21	3.11	3.33	3.28	43>2
Magazines	2.75	2.75	2.76	2.81	2.67	n.d.
Radio*	2.74	2.79	2.85	2.78	2.49	4<321
World Wide Web*	2.49	2.95	2.74	2.4	1.84	4<3<2<1
Television talk shows*	2.19	1.89	2.11	2.34	2.35	43>2>1

* F-test significant at the 0.05 level

Conclusion

The results reveal a trend of younger individuals having less self-reported knowledge of the food supply. As suggested this could potentially be related to a person's proximity to the food supply. The results of the age and residence analysis show a tendency for there to be less young people living on farms or in rural areas than in more urban areas.

Additionally, this study looked into the relationship between age and different food choices. First, results were reviewed that illustrated the differences between age and perceptions of health issues. It was found that older adults tend to be more health

conscious as well as more concerned about health issues and consider these issues when making food choices. This was further confirmed with the results from analysis of factors affecting food decisions. Once again older adults were more likely to consider nutrition and health benefits of the foods they chose than were younger adults in the 34 and younger category. These younger adults were more likely to consider price and availability over nutrition and health benefits, but older adults were still very likely to consider price and availability as well. These results suggest that older adults consider more strongly a range of health-related factors when making food choices than younger adults.

In order to make these food choices, consumers must obtain information about the food supply. Trust and perceived helpfulness of information sources were analyzed. It was discovered that older adults were more likely to trust extension agents, farmers, consumer groups and the USDA than were younger adults. In respect to helpfulness of sources, younger individuals saw the World Wide Web as more helpful, while older adults had more of an inclination to view television talk shows as helpful.

These differences in perceptions across the generations can have some important implications for the way consumers are viewed by producers and sellers. Marketing and product development can be greatly swayed by the ways consumers make food choices. Failure to respond to these perceptions and attitudes can result in company losses and a reduced connection with customers and the product. Due to the differences in relation to health concerns, the low level of importance that health plays for younger individuals could become a growing problem if the attitudes are generational versus based on life course. This shows a potential need for educational programs about making healthy lifestyle and food choices.

This study allows for many avenues of continued research. Discovering the reasons behind these differences in perceptions could enhance marketing and production even more to be tailored toward consumer desires. In addition to discovering the reasons, as stated in the previous paragraph, evaluating whether these differences are simply due to age and life course or are truly changing with each new generation would be very beneficial research to better understand how to educate individuals and prepare for the future. It also a potential that the trends in perceptions related to the food supply may carry over into other agricultural and environmental issues. This would be a good avenue to investigate for future research as well.

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