

**ALTERNATIVE AND CONVENTIONAL AGRICULTURAL
REPRESENTATIONS IN THE UNITED STATES: RESULTS FROM
TWO NATIONAL MAIL SURVEYS, 1992 AND 2001***

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ABSTRACT

This article examines the ways in which perceptions of agriculture are represented by the American public. Presented here are descriptive and exploratory findings from two national mail surveys that asked Americans about their views of agriculture, food, and the environment. I focus specifically on views related to the structure of agriculture as well as those related to the use of technology in food production. The goals of this study are to identify which sociodemographic segments of the American public favor alternative over conventional attitudes and to determine how this has changed over time. Overall, support for both alternative structure and technology is greater than support for either conventional structure or technology in the United States, and this has remained true over the nine-year period of the investigation. However, there are segments of the population that favor conventional agriculture. Implications for future research and policies are offered.

The importance of gauging where the public stands on agricultural issues has been stated with particular incisiveness by Wimberley (2002), who claims that no matter how closely the views of the public approximate reality, they can influence and shape how individuals behave as both consumers and citizens. Wimberley conveys the same notion as that expressed by Thomas and Thomas (1928:572), who argued, "If you define a situation as real, it is real in its consequences." As consumers, when people purchase food or clothing they indirectly support the system that created the materials for these products. As citizens, when people vote for political representatives or specific policies, they influence the direction of agricultural politics. The future of agriculture is thus heavily reliant on the attitudes, beliefs, and behaviors practiced by the American public. Building on this view, this article suggests that obtaining a sense of where the public stands on the alternative-conventional spectrum of agricultural issues can help direct policy and influence education, marketing, and consumption strategies.

Rural sociology has a well-developed body of research regarding the study of alternative and conventional agricultural paradigms among farmers and other

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agricultural specialists (e.g., Allen and Bernhardt 1995; Beus 1995; Jackson-Smith and Buttel 2003). In addition, the study of public opinion about agricultural issues has a long tradition (e.g., Wimberley et al. 2002). However, there is a gap between these literatures in terms of understanding the alternative and conventional views of the nonagricultural public. This article attempts to bridge this gap by using an approach that identifies alternative and conventional agricultural representations using data collected through national mail surveys in 1992 and 2001. While these data are not overwhelmingly recent, they offer a turn of century footprint of agricultural representations and provide information unavailable in other national surveys. Beyond descriptive goals, this study examines who is more likely to be conventional or alternative, focusing on gender, race, socioeconomic status (i.e., education and income), political ideology, and region of the United States.

Alternative and Conventional Paradigms

The notion of competing alternative and conventional agricultural paradigms was first introduced and outlined by Beus and Dunlap (1990). They base this dichotomy on the work of leading proponents from each paradigm. On the conventional side these include Earl Butz, Marion Clawson, Hiram Drache, Earl Hedy, Wheeler McMillen, and U.S. Representative Jamie L. Whitten, on the alternative side, they are William Aiken, Wendell Berry, C. Dean Freudenberger, Wes Jackson, Gene Logsdon, and Robert Rodale. Beus and Dunlap state that conventional agriculturalists tend to support a highly centralized agricultural structure, promote reliance on high-input technologies that maximize output and efficiency, and emphasize the need for greater economic competition, specialization, and scientific research and development. In contrast, alternative agriculturalists prefer a decentralized structure such as having smaller, family, non-corporate farms, and the use of techniques that are free from high-input technology, the importance of greater crop diversity, and improved community and ecological sustainability.

Most of the research based on the alternative-conventional agricultural paradigm debate has used the ACAP (Alternative-Conventional Agricultural Paradigm) instrument developed to measure these opposing paradigms (Beus and Dunlap 1991, 1992, 1994a, 1994b; Dunlap et al. 1992). So that the current study may make direct comparisons with ACAP findings, I offer a detailed discussion of past ACAP analyses. However, a summary of findings is offered before this discussion should the reader wish to bypass the finer details.

Summary of ACAP (higher score=pro-alternative) hypotheses and findings:

- Higher ACAP scores will predict alternative farmer behaviors (supported)
- Women will score higher on ACAP (supported)
- Younger people will score higher on ACAP (counter-support)
- Greater education will lead to higher score on ACAP (counter-support)
- Type of education will influence ACAP scores (supported)
- Political liberalism will lead to higher score on ACAP (supported)
- Greater agrarianism will lead to higher score on ACAP (partial support)

The ACAP has been administered to university faculty (Beus and Dunlap 1991, 1992) as well as agricultural specialists and farmers (Beus and Dunlap 1994a; Allen and Bernhardt 1995; Jackson-Smith and Buttel 2003). One goal of this research has been focused on predicting farming practices or behaviors. For instance, Beus and Dunlap (1994a) find that the ACAP successfully predicts farmer behaviors, measured by pesticide use, selection of a fertilizer source, growing a home garden, and farm diversity. Jackson-Smith and Buttel (2003) more recently replicated this study with a somewhat different questionnaire containing selected items from the ACAP and some original questions. They similarly measure farmer behaviors by pesticide and fertilizer use, but add genetically modified seed use. They find that their overall instrument was inconsistent in predicting farmer behavior. However, they add that successful predictions were made by two subscales of the instrument: one that addressed family-farmism and one addressing environmentalism.

Besides predicting farming practices or behaviors, another goal has been to identify who is more likely to hold conventional or alternative views. In reviewing ACAP research, Beus (1995:38-39) finds that women are often pro-alternative based on the observation that they are generally stronger advocates of "environmental protection, appropriate technology, risk avoidance, and other issues closely related to the alternative agriculture paradigm." Similarly, it was expected that younger people should be more pro-alternative. However, support was not found for this in the sample of agricultural organization members, for whom the relationship was nonsignificant. In the sample of farmers there was, surprisingly, a positive relationship between age and the ACAP. Next, Beus (1995) notes that because education is typically associated with environmental concern, ACAP scores were predicted to increase with education. Again, the results ran contrary to expectations. In the farmer survey, the less educated farmers were more pro-alternative. For the agricultural organization member survey, there was no statistically significant relationship. It should be noted, however, that Beus and

Dunlap (1992) found that the type of education matters, since university faculty in traditional agricultural sciences were more likely to hold conventional paradigm, while those in the humanities and social sciences were more likely to hold the alternative paradigm. One might imagine that individuals trained in business management might lean in the direction of the conventional paradigm. Perhaps related to type of education is political ideology. Beus notes that there is a positive and significant relationship between political liberalism and the alternative paradigm, as well as a positive and significant relationship between political conservatism and the conventional paradigm.

In another study, Beus and Dunlap (1994b) examine the relationship between agrarian ideology and the ACAP. In their analysis, and unlike previous studies, for this analysis the ACAP is divided into five subscales each of which are correlated with five subscales of an agrarian ideology measurement instrument. The overall correlation between the ACAP and agrarianism is moderate and statistically significant, but the magnitude is not as great as some correlations found between the subscales of each. For example, the economics and production subscale of agrarianism has a higher correlation with the ecological subscale of the ACAP. Beus and Dunlap (1994b) conclude from this that both alternative and conventional agriculturalists are agrarian, in terms of viewing agriculture as fundamental, but they differ in the importance they place on efficiency and productivity.

In considering the overall utility of ACAP, Jackson-Smith and Buttel (2003) conclude that it is mainly appropriate for use with what they call the agricultural “intelligentsia”—i.e., university faculty and other specialists—and is not appropriate for a more general population of farm operators. I extend their argument to claim that neither is it appropriate for a general sample of the nonagricultural public. Another criticism of the ACAP is that it is a gendered measurement instrument (Chiappe and Flora 1998). This is mainly because it fails to include several salient issues that women often define as important with respect to agriculture. In spite of the shortcomings of the ACAP, and as will be illustrated later, the general ideas that it measures can be deconstructed and examined individually in a more appropriate fashion for public opinion.

Public Opinion about Agricultural Issues

Although not originally considered within the framework of the alternative-conventional debate, the American public has been studied by rural sociologists regarding several relevant agricultural topics that can be interpreted in this light. For example, Wimberley, Thompson, and Lobao (2002) examine public attitudes

about the role of government, and show that the public is undecided and apathetic toward the government's agricultural policies. They report that there has been a slight decrease in agreement with the idea that farmers should compete in a free market. Simultaneously, they find strong support for policies helping small and family-owned and operated farms, and significantly less support for policies supporting large and corporate, nonfamily farms. These findings point to a movement in the direction of alternative beliefs regarding agricultural structure.

Ohlendorf, Jenkins, and Tomazic (2002) examine a neglected area of research concerning public attitudes about farm animal welfare. They report that most U.S. residents feel that human rights are more important than animal rights, while a sizeable minority—one-fifth—feel that human rights are not more important. Ohlendorf and his colleagues suggest that this is indicative of a general western anthropocentric moral and ethical system. In other words, when it comes to animal welfare, most of the American public is conventional in its views. Kendall, Lobao, and Sharp (2006) build on this research identifying sociodemographic factors related to support for animal well-being. They find women, younger people, blacks, and people with less income and education are more concerned with animal well-being. In addition, they argue for the importance of place-based characteristics and unique individual experiences with animals.

Several studies have examined public perceptions of the relationship between agriculture and the environment. Harris and Bailey (2002) find that, while some concern is expressed over the environmental impact of farming, only a quarter of the public views agriculture as a major source of pollution. Consistent with this, Tomazic and Katz (2002) report that the public is less concerned about the environmental impact of extractive and agricultural industries on water quality, than about the impact of traditional manufacturing or hazardous and solid waste landfills. Specifically, hazardous waste sites, factories, solid waste landfills, mining, and timber harvesting are rated as worse environmental threats than crop farming or animal production. Hoban and Clifford (1994) observe that people are generally most concerned about their health when they express negative attitudes about the impact of farming on water quality. Thus, overall there is some concern expressed about the impact of agriculture on the environment and human health, but this concern is less compared with concern for the impact of other economic activities.

Besides having reservations about environmental impacts, the American public holds reservations about the human health impacts of agriculture. For example, drawing from the perspective of risk analysis, Molnar, Traxler, and Harris (2002) find general uneasiness about the use of pesticides in the United States. They state

that the main connection people make is the risk that pesticides pose to human health, particularly those that are the most severe and rare as opposed to those that are common and less severe. Given the public uneasiness of pesticide use, it is not surprising to find that Tomazic, Katz, and Harris (2002) report public perceptions of organic food to be highly favorable. They note in particular that the strongest negative public attitudes are toward foods treated with radiation or nitrates. All these findings suggest that, when it comes to technology, the American public appears to favor an alternative approach to food production.

Making the Connection: Examining Agricultural Representations

To sum up the state of the literature, research on the alternative and conventional agricultural paradigm debate has been limited to those directly involved in agriculture either as farmers, farm organization workers, members of related organizations, or as university professionals. Meanwhile, research on agricultural public opinion has been conducted outside the alternative-conventional framework. Here these literatures are brought together, so that the public as a whole, as well as various sub-populations, can be located along the spectrum from conventional to alternative.

The main obstacle to a bridge between these literatures is based on the use of the paradigm concept. It may be a stretch to suggest that the American public has developed such a sense of where they stand on agricultural issues that they can be accurately placed on either side of the conventional-alternative paradigm debate. A more appropriate assumption would be that the American public has thought about many agricultural issues, has some notion or image of how food is produced, and holds several related concerns. However, these beliefs, images, and attitudes may not be consistently alternative or conventional for any individual, category of individuals, or the public as a whole.

Therefore, as an alternative to the paradigm approach, I suggest the social representation approach (Moscovici 1988, 2001), and more specifically, the public's agricultural representations. Moscovici (1988:220) defines social representations as "networks of interacting concepts and images whose contents evolve continuously over time and space." Although Durkheim introduced the similar notion of "collective representations," Moscovici (2001) departs from Durkheim's thought because of the implied assumption of societal consensus that may not necessarily exist. Durkheim's collective representation concept is consistent with the idea of a single unitary paradigm held at the societal level.

Consistent with Moscovici, Doise (1993) argues that Durkheim's collective representation concept is limited because it is based on only one of three possible communicative relationships. He calls this Durkheimian equivalent "propagation" as it entails consensus around an organized representation that can organize and process new information. For instance, if an HIV vaccine were to be invented, news would likely spread rapidly through the United States and people would line up to receive their shots. This is because there is widespread consensus around a scientific representation that provides the ability to process such news (i.e., disease theory, faith in science and progress).

However, Doise contends that Durkheimian theory falls short when there is either no pre-existing representation or, alternatively, when there are competing representations and no consensus. "Diffusion" results when the public lacks a representation capable of processing new information. This might be the case if news of an HIV vaccine were to break in a culture lacking a western scientific representation. Alternatively, "propaganda" is the result of competing representations held by different segments of society (Doise 1993). For example, religion may provide a competing representation that interprets HIV vaccines as perpetuating sin in society. Thus rather than embracing the vaccine—as with a scientific representation—the public may attempt to have it suppressed. In either case, whether diffusion or propaganda, the implications are markedly different from that of propagation (i.e., consensus).

Social representation theory is useful for informing the current theorization of how the public thinks about agriculture considering the alternative-conventional agricultural paradigm debate. In the world of experts and practitioners, the debate is characterized by propaganda with each side pushing its representation of agriculture on the other. For the public, the issue of agriculture can be characterized by diffusion, since most people are not experts or practitioners. They must therefore rely heavily on experts to process information about agriculture for them. In turn, since the experts themselves lack consensus, the public must choose those experts with whom they will side. One might expect that this dynamic will produce a mirror image of the agricultural paradigm debate at the societal level, as certain segments of the public will side with conventional agriculturalists while others side with alternative agriculturalists.

Hence, social representation theory provides a more dynamic way to examine agricultural thought than does the paradigm approach (Beus 1995; Beus and Dunlap 1994b; Chiappe and Flora 1998). An added bonus is that it provides the ability to shift focus from experts and practitioners to the public. Simultaneously, it allows

us to move beyond seeing public attitudes as unrelated to or independent of one another, as with the traditional public opinion research, which is largely atheoretical. While it may empirically treat the same topics—e.g., the structure of agriculture, uses of alternative technologies, the environmental and health impacts of agriculture, agrarianism in society—it does not encourage one to ask questions that forge connections between these topics. Alternatively, one could ask if support for corporate farms is related to support for the use food irradiation, if support for small farms would entail support for a reduced reliance on pesticides and fertilizers, or if support for farm animal well-being is related to ideological beliefs favorable to science and progress. Such questions require a theoretical framework that has been missing. Paradigm research provides a limited starting point, but it cannot be extended in a useful way to the public. Thus, social representation theory provides a way to fill this gap.

Data and Methods

For this analysis, I use data from two national mail surveys. Following Dillman's (1978) Total Design Method, two questionnaires, one in 1992 and one in 2001, were mailed to non-institutionalized adults aged 18 and older. These questionnaires were part of the S246 and S276 Land-Grant University multistate regional projects, conducted for social science research and policymaking. In both questionnaires, respondents were asked a series of questions about agriculture, food, and the environment. Some items were not repeated verbatim on both questionnaires, and the order of items and arrangement of question sets had slight differences. By minimizing response bias due to order and question set effects these differences—though not intentional—should help provide greater validity to the findings. The particular questions relevant to this analysis are offered in Appendix 1.

The initial mailing of the 1992 questionnaire, cover letter, and return envelope was in February. Ten days later a reminder postcard was sent and soon followed by another questionnaire. The third questionnaire was mailed approximately one month later. The first wave of the 2001 questionnaire was mailed in late June. The second was mailed in August and followed a reminder postcard. The third wave was sent in November. Details of sample accounting and representativeness, including the known sampling population and return rate are offered in Appendix 1.

Because of low response rates, particularly for the 2001 survey, the data were weighted by U.S. Census parameters for age, race, sex, education, and income. The 1992 data were also weighted by population size in the fifty states, while the 2001

data were weighted by population size in each of the nine Census regions. The proximity in time between the surveys and the Census periods serves to enhance the appropriateness of the weights.

The weighted sample statistics compare well across the two surveys, with other Census parameters, and also with items from other national surveys (e.g., the General Social Survey) conducted during the same periods. For example in 2001 a question on the U.S. Census' Current Population Survey (CPS) asked respondents about having internet access. This survey found that 44 percent had access. On a similar item, the S276 survey found that 42 percent had internet access. Another item in the weighted S276 data found that 55 percent of the respondents were married, while the U.S. Census parameter is 56 percent.

Because the main focus of this study is on the structure of agriculture and agricultural technologies, several items measuring these topics were selected from the 1992 and 2001 surveys. The central analytic method used here is exploratory factor analysis with principal axis factoring techniques and oblique promax rotations. If orthogonality is found between factors using principal components method, determining whether the factors are truly uncorrelated or if the orthogonality is an artifact of the method is difficult. However, if orthogonality is discovered with principal axis factoring, it can be concluded with confidence that it is not an artifact of the method (Kim and Mueller 1978). Summated indexes constructed from the dimensions of the above items will be examined for longitudinal changes in the direction of being either mostly conventional or alternative.

Results

As observed in Table 1—displaying the descriptive statistics of the individual items used for the factor analysis—it is striking how similar agricultural attitudes are over time, since the items are drawn from two independent samples nine years apart. The largest attitudinal support shift is 0.3 on a 5-point scale. Most items changed by less than 0.2. Items rating highest in support over time involve government policies helping small and family farms. Items rating lowest in support are about government policies helping large and corporate farms, as well as items referring to the safety of food irradiation and hormones in meat. One might conclude from this that public opinion has not budged much over time. However, when their correlation matrices from 1992 and 2001 are considered (not shown), the relationships between items have evidently changed direction and

TABLE 1. DESCRIPTIVE STATISTICS OF INDIVIDUAL ITEMS

ITEM		1992	2001
Large farms do not get too many government benefits (reflected).	Mean	2.4	2.7
	Median	2.0	3.0
	St. Dev.	1.1	1.0
Family farms should be supported even if it means higher food prices.	Mean	3.2	3.5
	Median	3.0	4.0
	St. Dev.	1.1	1.0
Government policies should help corporate, nonfamily farms.	Mean	2.5	2.7
	Median	2.0	3.0
	St. Dev.	1.0	1.0
Government policies should focus on helping small farms.	Mean	3.7	3.9
	Median	4.0	4.0
	St. Dev.	1.0	0.9
Government policies should focus on helping large farms (1992: be more efficient).	Mean	3.2	2.9
	Median	3.0	3.0
	St. Dev.	1.1	1.0
Government policies should focus on helping family owner-operated farms.	Mean	3.7	3.8
	Median	4.0	4.0
	St. Dev.	1.0	0.8
Food safety: foods that have been treated with radiation.	Mean	2.5	2.4
	Median	2.0	2.0
	St. Dev.	1.0	1.1
Food safety: meat from animals that have been given antibiotics.	Mean	3.1	2.9
	Median	3.0	3.0
	St. Dev.	1.0	1.1
Food safety: meat from animals that have been given hormones.	Mean	2.8	2.6
	Median	3.0	3.0
	St. Dev.	0.9	1.0
The government does not have adequate regulations for the use of pesticides and other chemicals on food crops (reflected).	Mean	3.1	2.9
	Median	3.0	3.0
	St. Dev.	1.0	0.9
I would be willing to pay more for food produced without using chemicals.	Mean	3.6	3.6
	Median	4.0	4.0
	St. Dev.	1.0	1.0
American farmers use more chemicals than are necessary to produce food.	Mean	3.4	3.4
	Median	3.0	3.0
	St. Dev.	0.9	0.9

Note: 1992 (n=2866) and 2001 (n=819) weighted data; The response to the above items are 1-Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, and 5-Strongly Agree

magnitude in many cases. This emphasizes the importance of looking beyond isolated attitudes and instead considering how the attitudes interact.

A useful way to investigate the way in which attitudinal items interact is through factor analysis. Table 2 reports the solution from an oblique promax rotated principal axis factor analysis for these items (similar results can be obtained using a varimax principal components analysis). It contains four dimensions with three items apiece at both time points. The number of factors was determined by examining eigenvalues, the amount of explained variation, and comparisons with other solutions containing more or fewer factors. As this table indicates for parallel items asked in 1992 and 2001, most of the rotated factor loadings are similar to the first decimal place. This is a notable level of similarity given that these are separate samples drawn from the population at different points in time. The biggest discrepancy can be found with the item that states, "Government policies should focus on helping large farms," where in 1992 the phrase "be more efficient" was appended to the end of the statement.

Other differences between loadings might be attributed to real changes in the population. For example, the item that states, "American farmers use more chemicals than are necessary to produce food," has a higher loading in 2001, and this could mean that Americans are becoming more strongly opposed to the use of chemicals.

Summing items from the four dimensions identified above, indexes were created for public perceptions on conventional structure, alternative structure, conventional technology, and alternative technology. Table 3 shows the descriptive statistics for these indexes. In comparing 1992 and 2001, some longitudinal changes may be noted. For example, both of the technology indexes declined. This suggests that people are moving more to the center on this issue. Meanwhile, both structure indexes increased, suggesting that the public is becoming more polarized in support of either conventional or alternative structure.

While Table 3 shows how individual indexes changed over time, Table 4 shows how the indexes' intercorrelations change over time. Alternative technology and conventional technology are negatively and moderately related over time. Alternative technology and structure are positively and weakly related over time. Conventional technology is negatively related to alternative structure, though the magnitude has increased from weak to moderately weak. The strength of the relationship between conventional technology and structure is weak, and the direction of the relationship has changed from negative to positive over time.

TABLE 2. PROMAX ROTATED PRINCIPAL AXIS FACTORS OF AGRICULTURAL REPRESENTATIONS

	1992				2001			
	CS	AS	CT	AT	CS	AS	CT	AT
Large farms [do not] get too many government benefits. ....	.57				.38			
Government policies should help corporate, nonfamily farms. ....	.57				.57			
Government policies should focus on helping large farms (1992: be more efficient). ....	.53				.75			
Family farms should be supported even if it means higher food prices.....		.45				.52		
Government policies should focus on helping small farms. ....		.80				.83		
Government policies should focus on helping family owner-operated farms.....		.89				.88		
Food safety: foods that have been treated with radiation. ....			.47				.40	
Food safety: meat from animals that have been given antibiotics. ....			.86				.88	
Food safety: meat from animals that have been given hormones. ....			.77				.88	
I would be willing to pay more for food produced without using chemicals.....				.69				.63
The government [does not] have adequate regulations for the use of pesticides and other chemicals on food crops. ....				.45				.53
American farmers use more chemicals than are necessary to produce food.....				.57				.69

Note: 1992 data n=2,866 and 2001 data n=819. The dimensions are as follows: CS (conventional structure), AS (alternative structure), CT (conventional technology), and AT (alternative technology).

TABLE 3. DESCRIPTIVE STATISTICS OF FACTORED INDEXES

		1992	2001	DIFFERENCE
Alternative technology index. . .	Mean	3.39	3.29	-.10***
	Median	3.33	3.33	(t=-3.34)
	St. Dev.	.70	.72	
Conventional technology index.	Mean	2.80	2.65	-.15***
	Median	3.00	2.67	(t=-4.41)
	St. Dev.	.78	.77	
Alternative structure index.....	Mean	3.52	3.73	.21***
	Median	3.67	4.00	(t=6.98)
	St. Dev.	.84	.74	
Conventional structure index...	Mean	2.66	2.76	.10***
	Median	2.67	2.67	(t=3.28)
	St. Dev.	.76	.74	

Note: The summated indexes have been adjusted to a 5-point scale.

*p<.05, **p<.01, ***p<.001

Finally, the relationship between conventional and alternative structure is positive, though the magnitude decreased from moderately weak to practically nothing. What each of these changes suggests is that there is a growing social distance or polarization between people who support conventional versus alternative structure and technology.

Next, note how these agricultural representation indexes are related to selected social and demographic characteristics in 1992 and 2001, as shown in Table 5.

TABLE 4. CORRELATION MATRICES OF SUMMATED INDEXES.

1992	AT	CT	AS	CS
Alternative technology index.	1			
Conventional technology index. .	-.42**	1		
Alternative structure index.....	.12**	-.05*	1	
Conventional structure index.....	-.01	-.05*	.26**	1
2001	AT	CT	AS	CS
Alternative technology index	1			
Conventional technology index	-.43**	1		
Alternative structure index	.18**	-.24**	1	
Conventional structure index	-.11**	.05	.03	1

Note: *p<.05, **p<.01, ***p<.001

Indicated by education and income it appears that both the alternative and conventional structure indexes are negatively related to socioeconomic status. Regional differences—though statistically weak—reveal that alternative structure is supported most in the Midwest, least in the South and West, and that the Northeast is most supportive of conventional structure. Age is correlated positively with alternative structure and negatively with conventional structure. Gender and race are not significantly correlated with alternative structure. Conventional structure is positively correlated with gender and negatively correlated with race.

In examining the technology indexes in Table 5, alternative technology has a negative relationship with income in 2001 but does not have a statistically significant relationship with education. Conventional technology has a positive relationship with both education and income. Alternative technology is positively related to being female and nonwhite, while conventional technology has a negative relationship with these variables. Age is negatively related to alternative technology but unrelated to conventional technology. Liberal political ideology is positively correlated with alternative technology over time, but not related to conventional technology. Regional differences are again weak, but show that individuals living in the Northeast and West often have slightly more support for alternative technology and less support for conventional technology; for those living in the Midwest the inverse is true; and individuals living in the South often have less support for alternative technology but no preference in terms of structure.

In sum, the greatest support for conventional structure comes from nonwhite females with a lower socioeconomic status, living in the Northeast. Alternative structure support often comes from older, politically liberal individuals living in the Midwest. Support for conventional technology often comes from individuals of a higher socioeconomic status who live in the Midwest. Last, support for alternative technology often comes from females who are politically liberal.

Discussion

In the preceding analysis four agricultural representations were identified in the United States: conventional structure, alternative structure, conventional technology, and alternative technology. Each is based on items drawn from two national surveys in 1992 and 2001. Separate analyses of both years result in the same dimensionality and factor loadings. In turn, because the internal composition of these representations is identical, I conclude that they are stable over time.

TABLE 5. ALTERNATIVE AND CONVENTIONAL REPRESENTATION ZERO-ORDER CORRELATIONS BY SELECTED CHARACTERISTICS.

	ALTERNATIVE		CONVENTIONAL		ALTERNATIVE		CONVENTIONAL	
	STRUCTURE		STRUCTURE		TECHNOLOGY		TECHNOLOGY	
	1992	2001	1992	2001	1992	2001	1992	2001
Gender								
(Female). ....	.031	.002	.120**	.173**	.156**	.121**	-.267**	-.198**
Race								
(Nonwhite).	-.021	-.033	.100**	.240**	-.021	.112**	-.113**	-.114**
Age.....	.037*	.162**	-.187**	-.030	-.110**	-.125**	.000	.035
Education. ...	-.043*	-.265**	-.005	-.184**	.033	.030	.179**	.166**
Income.....	-.070**	-.194**	-.035	-.205**	.031	-.155**	.107**	.215**
Politics								
(Liberal). ....	.107**	-.004	.024	-.014	.127**	.147**	.013	-.024
Northeast...	.012	.006	.053**	.091**	.071**	.009	-.041*	-.138**
Midwest. ....	.090**	.074*	-.056**	-.182**	-.051**	.023	.072**	.073*
West.	-.048**	-.123**	-.080**	.072*	.068**	.036	-.026	-.107**
South.....	-.042*	.007	.076*	-.025	-.081**	-.071*	-.004	-.006

Note: *p<.05, **p<.01, ***p<.001

While the internal composition of these representations is stable over time, the relationships between them are dynamic. If one were to make a prediction based on the idea that competing agricultural paradigms were mirrored in society—as suggested earlier in the theoretical discussion—then alternative representations should correlate positively with alternative representations, conventional representations should correlate positively with conventional representations, and alternative and conventional representations should correlate negatively.

Evidence for this can be found in the strong negative relationship between alternative and conventional technology, and the moderate positive relationship between alternative structure and alternative technology. However, counterevidence can be found in the relationship between conventional technology and conventional structure that is weak and negative in 1992 and unrelated in 2001, and conventional structure and alternative structure that is moderately positive in 1992 and unrelated in 2001. Stating that the public falls neatly along the lines of conventional or alternative would therefore be inaccurate. What can be concluded is that the relationships among the four agricultural representations are moving in the direction of those that would be expected if competing agricultural paradigms were fully mirrored in society, even if this is not yet the case.

Next, looking descriptively at these representations, it can be noted that conventional structure—large, corporate, and nonfamily farms—is not supported by most Americans. Meanwhile, alternative structure—small, noncorporate, and family farms—enjoys widespread public support. In terms of how food is produced, conventional technology—food irradiation, hormones, and antibiotics—is not viewed favorably by Americans. In contrast, support for alternative technology—resistance to pesticide use and support for policies and practices that create chemical-free food—is strongly supported. The upshot is that the public, when viewed as a whole, often stands on the alternative end of the spectrum regarding structure and technology.

The next issue to consider is how these representations vary along the lines of different sociodemographic characteristics. An examination of bivariate correlations suggests that there are in fact several differences. The specifics of these can be considered against the backdrop of past ACAP research discussed earlier (as summarized by Beus 1995). First, past research does not support the hypothesis that age is negatively related to alternative views. The current analysis reaches the same conclusion regarding structure, but not in terms of technology. In other words, this study finds that, while younger people often favor low impact technologies, older people often favor small, non-corporate, and family farms. This may in fact

reflect a cohort effect, whereby the younger generation came of age during a period of heightened environmentalism while the older generation grew up when the structure of farming changed dramatically toward having greater concentration and increased farm size. These contextual factors likely play an important part in shaping support for alternative and conventional representations.

Next, past ACAP research does support the hypothesis that being female is positively related to alternative views. This study concurs as to technology. However, the same is not true for structure, as males often favor alternative structure more than females. As for education, past ACAP research does not find support for the notion that higher education will result in more alternative views, while this study finds that education is negatively related to both alternative and conventional structure, and positively related to both alternative and conventional technology. Given these surprising findings, knowing what kind of education people have may be helpful, as those trained in social sciences and humanities may differ greatly from those trained in agricultural sciences (Beus and Dunlap 1992) or business school, for example. This information may explain these otherwise paradoxical findings. Finally, and consistent with past ACAP research, the current study finds support for a positive relationship between political liberalism and alternative views. However, it should be noted that the relationship to alternative structure is only supported in 1992, suggesting that this may be changing.

In sum, the above comparisons between this study and those of past ACAP research share several similarities. This implies that the public has similar patterns of thought in comparison to farmers, agricultural organization members, and university faculty. Also, because partial support was found often, it can be noted that examining structure and technology separately may produce different results than examining them as part of larger paradigms. This may suggest that even among the agricultural experts, views of structure and technology may exhibit different sociodemographic patterns. This is an issue worth further exploration.

Besides the sociodemographic differences discussed above, this study also finds that agricultural representations have minor regional differences. However, because the magnitude of regional differences are so weak, I hesitate to dwell excessively on them. In short, it was found that individuals in the South are slightly opposed to both alternative structure and technology, those living in the Northeast and West often favor conventional structure and alternative technology, while those living in the Midwest often favor alternative structure and conventional technology.

Conclusion

Implications for Research

This analysis has offered a new concept—agricultural representations—as an attempt to bridge two previously related yet independent literatures: one concerned with the alternative-conventional agricultural paradigm debate and the other concerned with public opinion about agricultural issues. The use of this new concept of social representations allows for greater flexibility than the paradigm concept. It does not assume *a priori* that there will be a high level of internal consistency and stability between agricultural attitudes. Simultaneously, social representations move a step beyond public opinion research that often treats agricultural attitudes about different topics as independent or unrelated.

Whereas administering the ACAP to the public may be inappropriate, the study of independent attitudinal items ignores how attitudes fit together. Using the agricultural social representation approach provides a middle ground. Similarly, administering the ACAP to *any* population may be problematic as it assumes the same items will evoke the same meaning in respondents over time. As this instrument approaches its twenty-year anniversary, it may be time to evaluate if it still measures issues salient to alternative and conventional agriculturalists. One might expect that the rise in concerns over foreign dependence, the increased globalization of food, and greater social demands for social and environmental sustainability would have an impact on the alternative-conventional debate. One might also expect that characteristics of respondents will influence the salience of particular issues, as suggested by the findings here.

Limitations in the availability of data prevented the testing of many important issues in the current analysis. Future research is needed to determine which way the public leans on other contemporary issues, the extent to which alternative attitudes positively correlate in the future, the extent to which conventional attitudes positively correlate in the future, and the extent to which alternative and conventional attitudes become mutually exclusive. Another avenue for research would be to construct causal models. This paper has identified some basic bivariate relationships between agricultural representations and various sociodemographic variables. Each variable examined had at least some relationship to one or all of the agricultural representations, and these were similar to findings from previous ACAP studies. The remaining questions to answer are why do individuals often develop alternative or conventional views, and what are the key causal mechanisms leading to these differences.

Implications for Policy

The implications of this analysis have importance beyond academic concerns, as current and future policies can be evaluated for their consistency with agricultural representations. For instance, since the 1970's, the nonagricultural public has been blamed for supporting a movement toward neoliberal free market ideals that undermine the well-being of farmers and favor cheap food (Winders 2004). The current study shows clearly that the public as a whole is supportive of farmer well-being—particularly small and family farmers (i.e., alternative structure)—and that such support often increases along with support for alternative technology. Thus the tendency to blame the public as a whole is unwarranted, as only segments of society are supportive of the neoliberal economic changes that accompany conventional agriculture.

In accounting for policy change, it is also worth noting that the public is only one part of a larger sociopolitical landscape. A complete analysis would need to consider the political and economic institutional framework. For instance, Winders (2004) provides such a structural account of policy changes by examining shifting coalitions between the Corn Belt, Wheat Belt, and Southern states. Winders (2004) concludes that policy explanations based on public opinion are insufficient, since so much can be attributed to class interests and the state-market coalitions that result from them.

This observation notwithstanding, examination of public opinion remains important particularly since the public has a direct influence on the economy through its ability to create or destroy demand for certain products. For instance, in response to demand for alternative technology, market share for organic food has grown substantially, from 0.8 percent in 1997 to 1.9 percent in 2003 (Obach 2007). This appears to suggest a direct link between public opinion and economic change. However, because the notion of organic does not include considerations for alternative structure, the same congruency between demand and policy cannot be said to exist in terms of support for small and family farmers.

One viable policy recommendation that would reconcile public demand for products produced by an alternative agricultural structure would be to incorporate ideas from what the late rural sociologist Thomas Lyson (2004) calls “Civic Agriculture.” Specifically, Lyson (2004:86) recommends the following:

1. Farming is oriented toward local markets that serve local consumers rather than national or international mass markets

2. Agriculture is seen as an integral part of rural communities, not merely as production of commodities
3. Farmers are concerned more with high quality and value-added products and less with quantity (yield) and least-cost production practices.
4. Production at the farm level is often more labor-intensive and land-intensive and less capital-intensive and land-extensive. Farm enterprises are often considerably smaller in scale and scope than industrial producers.
5. Producers more often rely on local, site-specific knowledge and less on a uniform set of "best management practices."
6. Producers forge direct market links to consumers rather than indirect links through intermediaries (wholesalers, brokers, processors, etc.)

Civic agriculture thus provides a model of production that may satisfy public demand for alternative structure. The creation of products produced in this way would allow the public to exercise demand that may ultimately influence political change.

As conventional agriculture continues to globalize and embrace free market ideals, the public will continue to reflect and make choices that reinforce or challenge its current path. This analysis shows that while certain segments of society continue to support conventional agriculture, the public as a whole prefers alternative agriculture. The main question to follow this analysis is thus: why do people come to hold alternative or conventional representations of agriculture?

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Appendix 1: Sample and Questionnaire Information

Sample Accounting and Representativeness

1992:

- Known = $\left[\frac{(\text{completed} + \text{refused} + \text{deceased} + \text{bad addresses})}{10,000} \right] * 100$
 $= \left[\frac{(2,866 + 165 + 56 + 1,587)}{10,000} \right] * 100 = 46.7\%$
- Return Rate = $\left[\frac{(\text{completed} + \text{refused} + \text{deceased})}{(10,000 - \text{bad addresses})} \right]$
 $* 100 = \left[\frac{(2,866 + 165 + 56)}{(10,000 - 1,587)} \right] * 100 = 36.7\%$

2001:

- Known = $\left[\frac{(\text{completed} + \text{refused} + \text{deceased} + \text{bad addresses} + \text{other})}{6,039} \right]$
 $* 100 = \left[\frac{(819 + 19 + 14 + 1,408 + 8)}{6,039} \right] * 100 = 37.6\%$
- Return Rate = $\left[\frac{(\text{completed} + \text{refused} + \text{deceased} + \text{other})}{(6,039 - \text{bad addresses})} \right]$
 $* 100 = \left[\frac{(819 + 19 + 14 + 8)}{(6,039 - 1,408)} \right] * 100 = 18.6\%$

Questionnaire Items in the Analysis

Structure items:

1. Large farms get too many government benefits. (1-Strongly Agree, 2-Agree, 3-Undecided, 4-Disagree, 5-Strongly Disagree)
2. Family farms should be supported even if it means higher food prices. (1-Strongly Agree, 2-Agree, 3-Undecided, 4-Disagree, 5-Strongly Disagree)
3. Government policies should help corporate, non-family farms. (1-Strongly Agree, 2-Agree, 3-Undecided, 4-Disagree, 5-Strongly Disagree)
4. Government policies should focus on helping small farms. (1-Strongly Agree, 2-Agree, 3-Undecided, 4-Disagree, 5-Strongly Disagree)
5. Government policies should focus on helping large farms (in 1992: "be more efficient"). (1-Strongly Agree, 2-Agree, 3-Undecided, 4-Disagree, 5-Strongly Disagree)
6. Government policies should focus on helping family owner-operated farms. (1-Strongly Agree, 2-Agree, 3-Undecided, 4-Disagree, 5-Strongly Disagree)

Technology items:

1. Do you consider foods with each of the following preparations or treatments as very safe, safe, unsafe, very unsafe, or are you undecided? Food treated with radiation. (1-Very Safe, 2-Safe, 3-Undecided, 4-Unsafe, 5-Very Unsafe)

2. Do you consider foods with each of the following preparations or treatments as very safe, safe, unsafe, very unsafe, or are you undecided? Meat from animals given antibiotics at approved levels. (1-Very Safe, 2-Safe, 3-Undecided, 4-Unsafe, 5-Very Unsafe)
3. Do you consider foods with each of the following preparations or treatments as very safe, safe, unsafe, very unsafe, or are you undecided? Meat from animals given hormones at approved levels. (1-Very Safe, 2-Safe, 3-Undecided, 4-Unsafe, 5-Very Unsafe)
4. I would be willing to pay more for food produced without using chemicals. (1-Strongly Agree, 2-Agree, 3-Undecided, 4-Disagree, 5-Strongly Disagree)
5. The government has adequate regulations for the use of pesticides and other chemicals on food crops. (1-Strongly Agree, 2-Agree, 3-Undecided, 4-Disagree, 5-Strongly Disagree)
6. American farmers use more chemicals than are necessary to produce food. (1-Strongly Agree, 2-Agree, 3-Undecided, 4-Disagree, 5-Strongly Disagree)

Independent Variables:

1. 2001: Are you: 1-Male 2-Female; 1992: What is your gender? Please circle the number (1-Male, 2-Female).
2. 2001: In what year were you born? ____ ; 1992: What is your age? ____
3. What is your race? (2001: 1-Black, 2-White, 3-Asian or Pacific Islander, 4-American Indian, or 5-Other; 1992: 1-Black, 2-White, 3-Asian or Pacific Islander, 4-Native American, or 5-Other)
4. Which of these best describes your usual stand on political issues? (1-Liberal, 2-Middle-of-the-Road, 3-Conservative)
5. 2001: What is the highest level of education that you have completed? (1-Less than High School, 2-High School Graduate, 3-Technical or Associate Degree, 4-Some College, 5-College Graduate, 6-Completed Post-graduate Degree); 1992: What is your education? (1-Less than High School, 2-Some High School, 3-High School Graduate, 4-Some College, 5-College Graduate, 6-Completed Post-graduate Degree)
6. Which of the following categories comes closest to your annual family income, before taxes? (2001: 1-Under \$5000, 2-\$10,000 to \$14,999, 3-\$15,000 to \$24,999, 4-\$24,000 to \$34,999, 5-\$35,000 to \$49,999, 6-\$50,000 to \$74,999, 7-\$75,000 or more; 1992: 1-Under \$10,000, 2-\$5,000 to \$9,999, 3-\$10,000 to \$14,999, 4-\$15,000 to \$19,999, 5-\$20,000 to \$24,999, 6-\$25,000 to \$34,999, 7-\$35,000 to \$49,999, 8-\$50,000 to \$74,999, 9-\$75,000 or more)