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Social Psychological and Structural Influences on Vegetarian Beliefs

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ABSTRACT This study examines the link between social structural variables (gender, race, education, age, rural childhood), individual social psychology (altruism, self-interest, traditionality, and openness to change), and beliefs about the benefits of vegetarianism (for health, the environment, animals, and world hunger) and self-reported vegetarianism. Data from a random sample of 420 adult U.S. residents showed that 5.2 percent considered themselves vegetarian. The strongest predictor of vegetarianism as a dietary choice was the belief that vegetarianism is beneficial to the environment. None of the social structural variables had a direct influence on vegetarianism as a dietary choice. Of the four values studied, only altruism and traditional values influenced beliefs about the benefits of vegetarianism. Altruistic values increased, and traditional values decreased, beliefs that vegetarianism is beneficial to health, the environment, farm animals, and world hunger. Blacks were more likely than Whites to adhere to the beliefs that vegetarianism helps prevent cruelty to farm animals, is beneficial to personal health, and is beneficial to the environment. The race differences in beliefs persisted even with controls for values.

Introduction

An individual's choice of a vegetarian diet takes place at the intersection between social psychology and the discourse of vegetarianism as a social movement (Dietz et al. 1995). At the individual level, human demand for particular types of food is driven primarily by social psychological factors, such as beliefs, attitudes, norms, and values (Breidenstein 1988; Guseman et al. 1987). As a social movement, vegetarianism claims that a vegetarian diet will benefit personal health and animal welfare, relieve world hunger, and reduce damage to the environment (Adams 1990; Lappe and Collins 1978; Robbins 1987). It is unclear how structural characteristics of individuals, such as gender and race, are linked with individual social psychology and the beliefs that drive vegetarianism as a social movement. Dietz et al. (1996) note that few studies have focused on the demography of vegetarianism, and much of the research that does exist is usually based on non-representative samples. However, the conclusion of most prior research on dietary choice is that social psychological, rather than demographic, factors determine dietary choice (see, for example, Dietz et al. 1995 and Sapp and Harrod 1989).

Vegetarianism and beliefs

Advocates of a meatless diet argue that vegetarianism benefits personal health and could prevent damage to the environment, world hunger, and cruelty to animals. Concern about the damaging effects of consuming animal fat and cholesterol is the most often cited rationale for adopting a vegetarian diet (Beardsworth and Keil 1992, 1993; Krizmanic 1992). Ethical concerns about the welfare of animals and the environment are also often cited as reasons for adopting a meatless diet (Adams 1990; Jabs et al. 1998; Krizmanic 1992), and ethnographic work suggests that such ethical beliefs are common among vegetarians (Beardsworth and Keil 1992, 1993; Krizmanic 1992). Sims (1978) found that vegetarians adhered more strongly to ethical, religious, and health values than nonvegetarians. Finally, a number of scholars claim that a global shift toward a vegetarian diet would help ease the problem of world hunger (Lappe and Collins 1978; Robbins 1987).

Vegetarianism and values

In a previous analysis, we found that vegetarianism was linked to several value orientations (Dietz et al. 1995). Individuals who held altruistic values were more likely than others to be vegetarian. Also, traditional values, such as loyalty, obedience, and family security, were associated with a decreased likelihood of vegetarianism. The negative association of traditionalism with vegetarianism has also been found in several ethnographic studies that document the difficulty vegetarians sometimes have in interactions with family and friends who resist their dietary choice (Amato and Partridge 1989; Beardsworth and Keil 1992; Jabs and Devine 1998). Since the American diet has commonly emphasized meat, traditional values might make one resistant to vegetarianism. And, although not documented by prior research, it is reasonable to expect that other values besides traditionalism might impact on vegetarianism. For example, self-interest may give weight to the health benefits of vegetarianism (or to the benefits of eating meat as "superior" food). And openness to change might make an individual receptive to vegetarianism as a lifestyle change.

Vegetarianism and structural characteristics

Research has documented that food choice is heavily influenced by social structure. Falk et al. (1996) found that the primary reasons older people congregated at eating sites was for socializing and companionship. Further, they reported that the elderly's food choice also involved value negotiations and the management of social contexts. For example, many elderly valued the management of

relationships between spouses or friends in a social context over their own taste preferences (Falk et al. 1996). Finally, Furst et al. (1996:255) concluded that people's food choices were influenced by "the composition and dynamics of their social framework," such as social roles and meaning, and Zey and McIntosh (1992) documented that the propensity to consume beef was influenced by subjective norms.

Both vegetarianism and support for vegetarian practices has been found to be more prevalent among women than men in a South Australian teenage sample (Worsley and Skrzypiec 1998). That study concluded that both self-reported vegetarianism and social support for vegetarianism was largely a female phenomenon and that vegetarian beliefs predicted vegetarian eating habits. The researchers also found that teenage vegetarians and nonvegetarians adhere to different ideologies in areas such as environmentalism, feminism, and animal rights and posited that the ideological differences might be the result of different personal values, or guiding principles (Worsley and Skrzypiec 1998). In addition, Jabs and Devine (1998) found that the maintenance of a vegetarian diet among a sample of New York State vegetarians was supported by organized movement groups concerned with animal rights, the environment, and health.

Finally, some argue that the value structure of vegetarianism can redefine the relationship between humans and the natural world (James 1993), including the "moral relations between us and the other animals" (Adams 1990:146). Adams (1990:17) also claims that vegetarianism is a feminist issue because eating meat symbolizes patriarchal control of both animals and women, and thus "vegetarianism covertly challenges a patriarchal society."

Our study moves beyond earlier work in two important ways. First, we include measures of individual beliefs about the impacts of a vegetarian diet on health, the environment, animal welfare and world hunger. Thus we test the general value/beliefs model previously developed to explain environmental concern (Stern and Dietz 1994; Stern et al. 1993, 1995b). Second, we test the model with a national sample. Thus, this study provides one of the few national estimates of the prevalence of vegetarianism and includes substantially more variation in demographic variables than previous studies. This variation allows a better examination of how demographics might influence both the choice of a vegetarian diet and beliefs about the benefits of vegetarianism.

Data and methods

Sample

Data were collected from 420 respondents throughout the United States using computer-assisted telephone interviewing in June 1994.

Phone numbers were generated using a random digit procedure, and random respondent selection within the household was accomplished using the "next birthday" method (Salmon and Nichols 1983). The overall response rate was 87.7 percent based on the number of households where a next birthday respondent was contacted who was over 18 and capable of responding to an English-language voice interview. The sample was 56 percent female, with a mean age of 44.2 years, a mean educational level of 14.4 years, and a median family income of $36,700. The ethnic distribution was 83.3 percent white, 6.5 percent black, 3.6 percent Hispanic, 2 percent Asian, and 4.6 percent other ethnicity. The analysis reported here is based only on the white and black respondents because of the small number of Hispanics, Asians, and other ethnics.[1] The working sample size ranged from 415 to 321, depending on the amount of missing data on variables used in the models.

Measures

Demographic characteristics of the respondents included *gender* (female or male), *race* (black or white), *age* (in years),[2] *education* (in years) and *rural childhood* (rural residence at age 16). In addition to a large number of questions on environmental issues, which are not a focus of this research, respondents were asked at the beginning of the interview, "Do you consider yourself a vegetarian?" (*Vegetarianism*). The response options were yes, no, and don't know. *Beliefs* were measured using a respondent's degree of agreement with the following statements: "I believe a vegetarian diet is generally more healthy than a diet that includes red meat" (*Health*), "I believe a vegetarian diet is less harmful for the environment than a diet that includes meat (*Environment*), "I believe a vegetarian diet helps prevent cruelty to farm animals" (*Animals*), and "I believe a vegetarian diet helps make more food available and helps reduce problems of hunger in this country and around the world" (*Hunger*). The response options were strongly disagree, disagree, agree, strongly agree. The four belief items loaded on a single principal component. We analyzed the items separately in order to detect different effects of values and demographics across beliefs. It should be noted that the item on health specifically mentioned red meat, while the other items did not. There was a moderate amount of data missing on these items. Data appear to be missing at random, so we used listwise deletion rather than imputing values. In a subsample in which all cases with missing data on any of these four

[1] The percentage of Hispanics identifying themselves as vegetarians was about the same as the percentage of whites. No Asian Americans, Native Americans or whites were self-reported vegetarians.

[2] We also examined the possibility of non-linear age/cohort effects using augmented component plus residuals plots. Those results suggested that age/cohort effects were adequately captured with a linear term.

beliefs was deleted, there were 19 vegetarians, or 5.86 percent, roughly equivalent to the percentage vegetarian in the full sample.

Values

Values were measured by asking respondents to rate, on a 1–5 scale, how important certain values were as guiding principles in their lives. The Schwartz (1992) value scales were modified to tap environmental values. Our analysis indicated a four-factor solution was appropriate. We have used these scales in a number of previous studies of environmentalism (Dietz et al. 1995; Stern et al. 1995a, 1995b, 1998). Dimensionality was determined using a bootstrapped principal components analysis. Factor structure was based on an iterated principal components solution with promax rotation. Stern et al. (1998a) detailed these results and compared them to a maximum likelihood factor analysis that yielded the same substantive results. We created an additive scale for each of the four factors (see Appendix), consisting of all items loading at least 0.40 on the factors: *Altruism* (alpha=.86), *Traditional* (alpha=.80), *Self-interest* (alpha=.69), and *Openness to change* (alpha=.62). As in our previous work (Stern et al. 1995a), this analysis did not reveal an empirical distinction between altruism towards humans and altruism towards other species. Items related to concern with the biophysical environment loaded on the same factor as items related to more humanistic concerns.

To account for variation in vegetarianism, we report estimates of logit analyses. Other dependent variables are modeled with ordinary least squares regression. In all analyses, hypothesis tests are based on the Huber/White robust variance estimator (Huber 1967; White 1980). Note that there are only 22 vegetarians in the sample. This extreme split will make measures of goodness of fit such as the pseudo-R^2 lower than would be the case with a less extreme split (Maddala 1992:330–32). The number in the smallest category is slightly below McFadden's (1984:1441–42) suggested rule of thumb for the use of asymptotic maximum likelihood in discrete choice models. Thus we view the logit results as exploratory. And of course, our assumptions about causal ordering may be incorrect. If so, the reported coefficients are biased estimates of causal effect but are still consistent estimates of partial association.

Results

Overall 5.24 percent of respondents considered themselves vegetarian (95 percent confidence interval, 3.3–7.8 percent). Table 1 shows the logit estimates from regressing demographics (gender, race, age, rural, education), values, and vegetarian beliefs on vegetarianism. Of the demographic categories, only gender has a significant gross effect on vegetarianism, with women twice as likely as men to

Table 1. Estimates of three models of vegetarianism

Independent variable	Vegetarianism (with demographics)	Vegetarianism (with demographics and values)	Vegetarianism (with demographics, values, and beliefs)
Female	2.332*	1.757	1.703
Black	2.563	2.434	2.307
Age	1.003	1.005	1.001
Rural	1.732	1.648	3.039
Education	1.085	1.034	1.023
Altruism	—	3.733***	1.458
Self-interest	—	0.958	0.858
Traditional	—	0.322**	0.720
Openness	—	1.320	1.335
Health	—	—	1.382
Environment	—	—	4.718***
Animals	—	—	1.066
Hunger	—	—	2.490
Intercept	—	—	—
R^2	0.036	0.095	0.304
Highest VIF	1.04	1.45	2.05
N	415	414	321

Note: Standard errors are based on Huber/White robust estimates. Coefficients are partial odds ratios.

* $p<0.10$.
** $p<0.05$.
*** $p<0.01$.

be vegetarian, net of other demographics. The gender effect loses significance when values or beliefs or both are controlled. This suggests that gender differences in vegetarianism may be a result of women holding different values and beliefs.

Altruism had a significant positive effect on vegetarianism when the demographics were controlled. Each additional point on the altruism scale roughly quadrupled the odds of reporting oneself a vegetarian. Holding traditional values decreased the odds of being a vegetarian, with each extra point on the traditional value scale reducing the odds by about a third. Both of these effects disappeared when we controlled for vegetarian beliefs.

Among the belief items, only the environmental item had a significant effect, with each one point increase on this scale nearly quadrupling the odds of being a self-reported vegetarian. Thus it appears that values and, especially, beliefs were strongly associated with a vegetarian identity, and to the extent there are demographic differences in vegetarianism these are the result of value and belief differences. The highest variance inflation factor among the independent variables in these analyses was just over two, suggesting that the results were not much influenced by collinearity among the independent variables.

As noted in the methods section, these results must be seen as exploratory, given the relatively small number of vegetarians in the sample. Further, we again note that the coefficients can be interpreted as measures of net association if one rejects our assumption that beliefs about a vegetarian diet are causally prior to reporting a vegetarian identity.

Table 2 reports regressions on the four belief items. Race was a significant predictor of every belief except the item about world hunger, and in each case, blacks were more likely to agree with the benefits of a vegetarian diet than whites. These race differences in beliefs persisted even when we controlled for values. Gender was a significant predictor of all four beliefs, with women more likely to endorse vegetarian beliefs than men. In each case, the effect became insignificant when the value scales were controlled.

Age influenced perceptions that benefits to the environment would follow from a vegetarian diet, and this effect persisted when values were controlled. Respondents with rural backgrounds differed from others in only one belief—they were significantly less likely to believe a vegetarian diet is beneficial to farm animals. Again, this effect persisted when values were controlled.

Both altruism and traditionalism had a significant effect, even when controlling for the demographic variables. Altruism tended to increase belief in the benefits of a vegetarian diet, and traditional values decreased those beliefs by roughly the same amount. Neither self-interest nor openness to change had a significant effect on any of the vegetarian beliefs.

Finally, in an analysis not shown here, we estimated all models with family income as a control. Using income reduced the working sample size by 40–90 cases (depending on non-responses for items in the models) but had only marginal effects on the variance inflation factor. Income was significant only in the logistic regression including demographics, values, and beliefs (odds ratio=0.974, p=0.04). Including income in the regression of health beliefs on demographics reduced the z value of the gender effect below the 0.1 level and in the regression of hunger beliefs on demographics and values increased the t value for the gender effect above the 0.1 level. All other differences among models controlling for income and those without the control were not statistically significant nor of a magnitude to warrant substantive interpretation.

Conclusions

In the full model, with both demographics and values included as independent variables, the only significant predictor of vegetarianism as a dietary choice was the belief that a vegetarian diet is less harmful to the environment than a diet that includes meat. Of the

Table 2. Regression of values and demographics on vegetarian beliefs

Independent variable	Health benefits (with demographics)	Health benefits (with demographics and values)	Environment benefits (with demographics)	Environment benefits (with demographics and values)
Female	0.136*	0.103	0.156**	0.100
Black	0.362**	0.373***	0.334**	0.354**
Age	0.000	0.001	0.004*	0.004**
Rural	−0.108	−0.104	−0.049	−0.044
Education	0.007	0.002	0.015	0.010
Altruism	—	0.183***	—	0.298***
Self-interest	—	−0.046	—	−0.054
Traditional	—	−0.285***	—	−0.394***
Openness	—	0.043	—	−0.008
Intercept	2.402	2.956***	1.962***	2.755***
R^2	0.032	0.076	0.041	0.152
Highest VIF	1.04	1.46	1.04	1.46
N	342	342	332	332

Independent variable	Animal benefits (with demographics)	Animal benefits (with demographics and values)	Hunger benefits (with demographics)	Hunger benefits (with demographics and values)
Female	0.158**	0.060	0.178**	0.097
Black	0.399***	0.355***	0.139	0.133
Age	−0.003	−0.003	0.002	0.003
Rural	−0.222**	−0.220**	−0.045	−0.042
Education	0.014	0.016	−0.012	−0.012
Altruism	—	0.379***	—	0.317***
Self-interest	—	−0.016	—	−0.048
Traditional	—	−0.360***	—	−0.306***
Openness	—	−0.015	—	0.020
Intercept	2.293***	2.428***	2.340**	2.489***
R^2	0.060	0.174	0.029	0.125
Highest VIF	1.04	1.46	1.04	1.46
N	340	340	328	328

Note: Standard errors are based on Huber/White robust estimates. For regression on beliefs, coefficients are unstandardized regression coefficients.

* $p<0.10$.
** $p<0.05$.
*** $p<0.01$.

four values studied, only altruism and traditional values influenced beliefs about the benefits of vegetarianism. Altruistic values increased beliefs that vegetarianism is beneficial to health, the environment, farm animals, and world hunger. Traditional values decreased the likelihood that respondents would endorse these beliefs.

The finding that altruism and traditionalism were important values in vegetarianism is consistent with our prior research (Dietz et

al. 1995). However, while our earlier study documented altruism and traditionalism as factors in the choice of a vegetarian diet, here we found that when we introduced measures of beliefs about the benefits of vegetarianism, the influence of values on dietary choice disappeared. Thus beliefs appear to mediate between values and behavior. While causal ordering cannot be unequivocably established with non-experimental data, these results are consistent with a theory of choice and behavior grounded in constructionist social psychology and a theory of structural constraints on behavior we have developed in previous work (Dietz and Stern 1995; Guagnano et al. 1995).

While structural characteristics had no direct effects on dietary choice when we controlled for values and beliefs, we did find substantial demographic variation in beliefs about the benefits of vegetarianism. Respondents with rural childhoods were less likely than others to believe that vegetarianism helps prevent animal cruelty. Perhaps the rural context of close contact with farm animals and hunting makes issues of animal welfare more controversial than in nonrural contexts.

Also noteworthy was the finding that black respondents were more likely than whites to endorse the belief that vegetarianism helps prevent cruelty to farm animals, benefits personal health, and is beneficial to the environment. The race differences persisted even while controlling for values. Women were similar to black respondents in their beliefs that vegetarianism helps prevent cruelty to farm animals and prevents world hunger. Thus, in those two beliefs, our findings are consistent with the argument that the moral views of white women and minorities are similar, perhaps because of similar circumstances of social subordination (Tronto 1987). Flynn et al. (1994) found that white men perceive environmental risks as substantially lower than either women or nonwhites, suggesting that social factors such as power and alienation determine risk perceptions. Here white men are also anomalous in their skepticism about the benefits of a vegetarian diet. Of course, given our sample size, these results are exploratory. Further research is needed on ethnic differences in dietary choice and in the beliefs and values that underpin those choices.

In future research, inclusion of more extensive questions on dietary practices would make it possible to identify and analyze those who do not consider themselves vegetarians even though they follow an essentially vegetarian diet and those who identify themselves as vegetarians while only approximating a vegetarian diet. The measure we used indicates self-identification, which is a useful starting point but does not capture the variation in identity and practice that undoubtedly exists, and, as one reviewer noted, the vegetarianism measure may not correspond closely to actual behavior.

Our work emphasizes a social psychological approach to vegetarianism, and our results suggest that dietary choice is driven at least in part by values and beliefs. But we believe this approach is congruent with the larger literature on vegetarianism that employs ethnographic methods with non-representative samples, and that emphasizes the construction of the vegetarian identity and the personal support that comes from interaction with other vegetarians. Thus, in addition to its intrinsic interest, vegetarianism provides a rich test bed for developing integrated theory that links social psychology with theories of identity and social movements.

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APPENDIX 1. Value Scales
(Respondents rated each item on a 1–5 scale in response to the statement "Please tell me how important each of these is as a guiding principle in your life.")

Altruism: α=0.86
1. Social justice, correcting injustice, care for the weak
2. Preventing pollution, conserving natural resources
3. Equality, equal opportunity for all
4. Unity with nature, fitting into nature
5. A world of peace, free of war and conflict
6. Respecting the earth, harmony with other species
7. Protecting the environment, preserving nature

Traditional: α=0.80
1. True friendship, close supportive friends
2. Loyal, faithful to my friends
3. Sense of belonging, feeling that others care about me
4. Obedient, dutiful, meeting obligations
5. Self-discipline, self-restraint, resistance to temptations
6. Family security, safety for loved ones
7. Honoring parents and elders, showing respect
8. Honest, genuine, sincere
9. Forgiving, willing to pardon others

Self-interest: α=0.69
1. Social power, control over others, dominance
2. Influential, having an impact on people and events
3. Wealth, material possessions, money
4. Authority, the right to lead or command

Openness to change: α=0.62
1. Curious, interested in everything, exploring
2. A varied life, filled with challenge, novelty and change
3. An exciting life, stimulating experiences