What are the odds of being an organic or local food shopper? Multivariate analysis of US food shopper lifestyle segments

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Abstract The growth in organic and local foods consumption has been examined using two different approaches to identify characteristics and motivations of food shoppers: market segmentation and economic models using multivariate analysis. The former approach, based on Means-end Chain theory, examines how intrinsic characteristics of foods affect food choices. The latter microeconomic approach examines economic constraints and extrinsic factors. This study demonstrates value in combining the two approaches to generate better empirical predictions of who buys organic and local food. It also supports a broader theoretical framework to explain behavior in terms of intrinsic and extrinsic motivations. Using US data, an adaptation of the Food Related Lifestyle model yields four consumer lifestyles segmented by intrinsic motivations related to food. Each consumer segment exhibits distinct organic and local foods consumption behaviors. A multinomial logit model is estimated to examine the probability of being in one of these four groups as a function of extrinsic variables and economic constraints. In support of Alphabet theory and Regulatory Focus theory, we find that inclusion of extrinsic factors improves prediction of behavior and the ability to explain why they buy organic and local foods. The extrinsic variables that significantly increase the probability of being in a particular consumer food lifestyle segment include: environmental concerns, health practices, race, the presence of a farmers' market, and to a lesser degree, family composition and income. We also find regulatory focus is most pronounced among the most active organic and local food shoppers.

Introduction

While food choices are commonplace, they have profound impacts on our health, on the environment, and our economic system. Over one-third of all deaths in the US are due to diet- related causes: heart disease, stroke, and diabetes (Xu et al. 2010). Food production is the largest user of vital economic and environmental resources in the US; it represents 46 % of all land use (Economic Research Service, US Department of Agriculture 2005) and 80 % of consumptive water use (Economic Research Service, US Department of Agriculture 2004). The food we buy and where we buy it affects the incomes, health, environment, and communities of those who produce, process, and sell food, and hence the very landscape used to produce the foods we buy. Understanding what motivates food choices can help us understand if and how it is possible to change people's choices, and hence, their impact on their health, the environment, the economy, and communities.

Consumers are often motivated to support organic or local agriculture because they believe they are more sustainable than conventional agriculture (Adams and Salois 2010; Baker et al. 2004; Hokanen et al. 2006; Lusk and Briggeman 2009; Zepeda and Li 2006, 2007). Organic and local foods represent a small but rapidly growing trend among US consumers. Organic food sales represent about 4 % of US food sales (Organic Trade Association 2010) and are expected to grow by 40 % in the next decade

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(NPD Group 2009), while local foods represent about 0.4 % of US food sales, but have grown at a rate of 59 % over the past ten years (Timmons and Wang 2010). We investigate whether organic and local food shoppers represent a distinct subgroup or lifestyle, or are their different kinds of organic and local food shoppers? What are their characteristics and motivations?

Two common tools have been used to investigate shopper characteristics: consumer segmentation and multivariate choice models. Economists use multivariate choice models to investigate characteristics of consumers that increase the likelihood that they purchase organic or local foods (e.g. Zepeda and Li 2006, 2007). In contrast, market researchers use consumer segmentation to identify homogenous consumer sub-groups. Grunert et al.'s (1997) Food Related Lifestyle (FRL) instrument has been widely used in Europe to segment consumers.

A hybrid of the multivariate choice model and consumer segmentation is used in this study to investigate the characteristics that increase the likelihood of being in a consumer lifestyle segment associated with buying organic and local foods. The purpose is to improve the prediction and understanding of consumers' motivations and to propose and test a broader theoretical framework for consumer lifestyle segmentation than Means-end Chain theory, the underlying theory for FRL models (Brunsø et al. 2004). Our research questions examine: is there value in terms of improving our understanding of consumer organic and local food choices by combining the two different approaches? Do extrinsic, nonfood motivations improve prediction of consumers' food lifestyles and their organic and local food choices? Are organic and local food shoppers motivated by a prevention or promotion focus?

US data from a survey instrument designed independently of the FRL model capture four categories of food lifestyle: ways of shopping, product attributes, meal preparation, and desired consequences. This data yields four consumer segments, rather than the five normally found in FRL studies. The segments vary in prevalence of purchase of organic and local foods, indicating that organic and local food shoppers are not homogenous subgroups, but that lifestyle is related to different purchase intensity.

The segments are used as dependent variables in a multivariate analysis to examine the relationship between intrinsic lifestyle motivations and extrinsic motivations categorized by prevention or promotions strategies. We use Higgins' (1997) theory of Regulatory Focus to assess motivational compatibility. In particular, we hypothesize that regulatory focus is of greater importance to consumer segments that are frequent organic and local food shoppers.

The explanatory variables for the multivariate analysis emanate from Alphabet theory (Zepeda and Deal 2009). They examine the roles of environmental motivations, non-food behaviors, knowledge, context and demographic variables, on the probability of being in a particular lifestyle segment, and hence on the likelihood of purchasing organic and local foods. We hypothesize that knowledge and information, non-food attitudes, and socio-economic constraints significantly affect the probability a consumer is in a particular lifestyle segment.

The contribution of this research is a better understanding of consumer motivations for buying organic and local foods; they differ by subgroup. By bridging two approaches to investigate consumer behaviors, multivariate choice models and consumer segmentation, and placing them within a broader theoretical framework, Alphabet theory, we achieve better predictions of organic and local food choices. The results provide explanations for conflicting findings about characteristics of organic and local shoppers, and insights into strategies to promote organic and local food sales for different consumer segments.

Literature review

Multivariate analysis of survey data has been commonly used by economists to identify the characteristics and motivations of organic and local food shoppers in the context of behavioral economics choice models. Avoidance of pesticides to protect the environment and one's own health are the most common reasons consumers give for buying organic foods (Adams and Salois 2010; Baker et al. 2004; Dimitri and Greene 2002; Harper and Makatouni 2002; Zepeda and Leviten-Reid 2004). However, using a representative sample of all US shoppers, a significant relationship was not found at the 5 % level between actual organic purchase and concern about personal health or environmental effects, while factors such as education, knowledge, lack of religious affiliation, shopping venue, enjoyment of cooking and attitudes towards food prices were significant related to organic food purchase (Zepeda and Li 2007). This does not imply that health and environmental attitudes are not important rationales for those who do buy organic foods, just that they are not strong predictors of actual behavior, perhaps because those who do not buy organic foods also share these attitudes but are impeded from buying organic foods by other factors.

Researchers of local food shoppers including farmers markets and Community Supported Agriculture (CSA), have found these consumers are motivated by nutrition, freshness, freedom from chemicals, concerns about the environment and economic support of farmers and the local economy (Adams and Salois 2010; Aguirre 2007; Eastwood et al. 1999; Kezis et al. 1998; La Trobe 2001; Lockeretz 1986; Roininen et al. 2006). Similar to organic food purchase, when using a sample of all shoppers,

different patterns emerge. Using data from Indiana, Jekanowski et al. (2000) found income, length of residency and perception of quality were significant at the 5 % level in predicting the likelihood of local foods purchases, while education was significant and negative. Using national data, Zepeda and Li (2006) found that the only significant demographic variable was the presence of another adult in the household; children, race, gender, education, region, age and income were not significant. However, behavioral variables were significant. Enjoyment of cooking, shopping at a health food store, gardening and purchase of organic food were significantly associated with local food purchase, while placing a high priority on price was significant and negative.

One implication of these multivariate choice models is that when comparing organic and local food shoppers to all food shoppers, behavioral factors and lifestyle are often more important than attitudes in predicting organic and local food purchase. So while nearly all organic and local food shoppers give environmental, health and support of the local economy as reasons for their purchases, this does not mean that when looking at a sample of all food shoppers, that these attitudes are good predictors of organic and local food purchase behaviors. Indeed, the gap between attitudes and behavior is widely recognized (Guagnano et al. 1995; Weinstein 1988; Zepeda and Deal 2009). It is also important to be mindful of who is being sampled; for example, studies that do not screen for food shoppers frequently identify gender as a significant characteristic of organic and local food shoppers (e.g. Aguirre 2007; Govindasamy et al. 2002; Kezis et al. 1998). However, when only food shoppers are sampled, gender has not been found to be significant (e.g. Zepeda and Li 2006, 2007). Thus, if predicting behavior is the goal, including those who do not shop complicates interpretation of the results.

Another approach to predicting behavior, commonly used in mass communication and marketing, is to segment consumers into groups with similar characteristics using cluster analysis of survey data. Segmentation can be based on product-specific behavioral attributes, general physical attributes (such as demographics), or psychological attributes of consumers (Gunter and Furnham 1992). Psychological data on lifestyles (especially activities, interests and opinions) have been shown to be particularly useful in identifying consumption patterns for communications strategies, resulting in a field of study on lifestyle research called psychographics (Vyncke 2002). The fact that multivariate analysis shows that behavioral factors are often the best predictors, points to psychographics or lifestyle analysis as a fruitful approach to examine organic and local food purchases. While many lifestyle instruments have been developed, the FRL model is the most relevant since it was developed to segment consumers according to food

preferences. It has been applied to several European countries (e.g. Pérez-Cueto et al. 2010; Scholderer et al. 2004), as well as Australia (Nijmeijer et al. 2004), to segment consumers using cluster analysis.

Prior FRL models have found five food-lifestyle subgroups: adventurous, careless, conservative, rational, and uninvolved (Buckley et al. 2005). These FRL models used a survey instrument with 69 seven-point Likert-scale variables proposed by Brunsø and Grunert (1995) and Grunert et al. (1997). The instrument reflects five categories of variables related to one's food lifestyle: ways of food shopping, food quality aspects, cooking methods, food consumption situations, and food purchasing motives (Pérez-Cueto et al. 2010; O'Sullivan et al. 2005; Scholderer et al. 2004). Ways of shopping refers to consumers' food shopping behavior, where they shop, and their use of information, such as labels. Quality aspects refer to the attributes consumers seek from food products. Cooking methods refer to how much effort and time is expended on meal preparation and who is responsible. Consumption situations addresses where and when food is eaten. Purchasing motives encompasses the desired consequences of a meal (O'Sullivan et al. 2005).

While the FRL model can be used to examine how food lifestyle can influence organic and local food choices, it should be emphasized that the 69 variables in the FRL model capture the intrinsic characteristics of food and the direct interactions between the consumer and food. They do not include extrinsic characteristics associated with consumers' food choice. As mentioned in the review of multivariate models, organic and local foods consumers often cite extrinsic characteristics, such as concern about the environment and/or producers, as their motivation (Baker et al. 2004; Hokanen et al. 2006; Lusk and Briggeman 2009; Zepeda and Li 2006, 2007).

Another limitation of the FRL model is that its theoretical foundation, means-end chain theory, has many shortcomings (Bagozzi and Dabholkar 2000). Means-end chain theory assumes that the relationship between product knowledge and consumer's self-knowledge have a hierarchal structure that links concrete ideas to abstract concepts in order to achieve an end. Some of the shortcomings that Bagozzi and Dabholkar identify include: internal inconsistencies, unobservable psychological information, and unrealistic assumptions. In the case of the FRL model, means-end chain theory is used to argue that food lifestyle functions as the expression of consumers' goals (Brunsø et al. 2004). However, a gap between goals and actions has long been recognized (e.g. Guagnano et al. 1995; Weinstein 1988). Indeed, a meta-analysis of determinants of pro-environmental behavior by Bamberg and Möser (2007) found that attitudes explain about half the variation in intentions, but intentions only explain one-quarter of the

variation in behavior. Therefore, in order to both incorporate extrinsic variables and bridge the gap between attitudes and behaviors, we look to other theoretical models to understand why organic and local food purchase may be associated with different food lifestyles within a broader theoretical framework than means-end chain theory. The objective is to be able to predict the variation in behavior better than the average model, i.e. to predict correctly better than 25 % of the time.

Alphabet theory (Zepeda and Deal 2009) serves as the framework to identify relevant explanatory variables in this study. It is an extension of Guagnano et al.'s (1995) attitude-behavior-context (ABC) model of consumer pro-environmental behavior. ABC theory emphasizes the role of context, in the form of constraints or incentives, in mediating between consumer intentions and behaviors. Alphabet theory incorporates the role of values, beliefs and norms (Stern et al. 1999), information seeking, and knowledge in forming attitudes, as well as, the importance of habits in mediating between context and behaviors. Knowledge and information are similar to attitudes in that, while they may be necessary, they are not sufficient for actions to result (Weinstein 1988). This process is necessarily dynamic; it takes time, in addition to intention and opportunity, to change habits.

Higgins (1997) offers further insights into motivations and how they affect behaviors; motivations differ in terms of how they operate and the strategies that they imply. Specifically, regulatory focus can be categorized as promoting a goal (e.g. buying local foods to support local agriculture) or preventing an adverse outcome (e.g. buying organic to reduce pesticide use). Higgins argues that the tendency for individuals to favor one strategy or another affects how they approach their goals. The implications for behavior are that promotion focus generates a risk taking bias or a tendency to say yes to achieve a desired goal, while prevention focus leads to a greater likelihood to say no to avoid undesired outcomes (Crowe and Higgins 1997). Applying Higgins' theory to meat consumption, de Boer et al. (2007) found that universalism was related to lower meat consumption and a tendency towards a prevention focus. Thus, regulatory focus can be used to classify consumers as prevention or promotion focused. Those with a prevention focus are concerned with avoidance, safety, protection, obligations, and responsibility, while those with a promotion focus are concerned with approaching or achieving a desired ideal, aspiration, hope, or goal (Crowe and Higgins 1997; Higgins 1997).

The resulting analysis bridges multivariate consumer choice models and lifestyle segmentation models. It utilizes consumer food lifestyle segments as dependent variables in multivariate choice analysis to examine the relationship between consumer lifestyle groups segmented according to intrinsic food characteristics and extrinsic explanatory variables categorized by prevention or promotions strategies. The objective is to improve understanding of the motivations of organic and local food shoppers.

We hypothesize that knowledge and information, non-food attitudes, and socio-economic constraints significantly affect the probability a consumer will be in a particular lifestyle segment. Specifically, we examine variables related to attitudes and habits about the environment and health, knowledge about organic food production, community characteristics, and personal characteristics that may limit or enhance consumers' choices of organic and local foods. The goal is to identify variables and constraints that are not part of lifestyle domains that may have a significant effect on the probability of being in a particular food lifestyle segment, especially those segments that are likely organic and local food shoppers. The result is better predictions about who buys organic and local foods, and places food lifestyle choices within a broader theoretical model of motivation.

In addition, we examine whether there are differences in regulatory focus of the consumer segments related to the probability of being in a particular lifestyle group. We hypothesize that the different segments will exhibit different degrees of regulatory focus and that in particular, regulatory focus is of greater importance to consumer segments that are regular organic and local food shoppers than non-shoppers.

Methods

We used existing US data that allowed us to develop similar variables to those used in the FRL model, rather than collecting new data using an FRL instrument. The structured, closed-ended survey instrument was developed independent of the Brunsø and Grunert (1995) FRL instrument (for details, see Zepeda and Li 2006, 2007). The US instrument used for this analysis incorporated elements of a variety of economic food survey instruments utilized in the US, as well as Weinstein's (1988) Precaution Adoption model. A key element in the survey instrument design was the use of a qualitative study of organic and conventional food shoppers to identify characteristics and issues relevant to organic and local food purchase (Zepeda et al. 2006; Zepeda and Leviten-Reid 2004). These studies highlighted the extrinsic motivations in organic and local food consumption, e.g. the environment, health, community support, and social justice. While developed independently, the US instrument contained many concepts similar to those in the Brunsø and Grunert FRL instrument. The data was used to estimate consumer lifestyle segments

that are therefore an adaptation of the FRL model. These segments are used as dependent variables to investigate the motivations and regulatory focus of consumers' food lifestyle choices.

Since the purpose of this study is to understand US food shoppers' decisions, sampling was restricted to those who shop for and/or prepare food. A human subjects internal review board further limited sampling to those 18 years or older. Screening questions ensured that survey respondents were adult food shoppers and/or preparers. Sampling was conducted via random dialing of private telephone numbers (30.3 % response rate) and a random mail sample of residential addresses (47.7 % response rate). The resulting US data (n = 956) were used to segment food shoppers.

The lifestyle segments were estimated via cluster analysis using only four domains of the FRL model: ways of shopping, product attributes, meal preparation, and desired consequence (See Nie and Zepeda 2011 for details). Unlike the FRL model, some of the variables, e.g. in the shopping and cooking domains, are measured in terms of frequency of behavior, rather than attitudes. The fifth domain, "usage situation" was not used because the instrument did not include variables to measure this. However, an empirical study (Nijmeijer et al. 2004) showed that this domain was relatively unimportant in determining one's FRL. It is important to emphasize that this analysis is an adaptation of the FRL model, not a replication. Therefore, variables and domains used in this analysis differ from those used in FRL studies since the survey instrument was developed independently of the FRL model.

Table 1 contains a description of the variables used to segment consumers. The variables can be classified using Higgins' (1997) Regulatory Focus theory. The "ways of shopping" variables (specialty stores, farmers' markets and community supported agriculture member) imply a promotion focus, since they involve approaching strategies. The "product attributes" of freshness, taste, brand, organic are likewise promotion focus, since they involve seeking the attribute to achieve a goal. The importance of healthiness, safety, convenience, and cost can be classified as prevention focus because the orientation is one of avoidance of harm or expense, e.g. time or money (Levav et al. 2010). The "meal preparation" variables are worded in terms of aspirations or goals, reflecting a promotion focus, while the "desired consequences" are worded as obligations or responsibilities; hence, they reflect a prevention focus.

Results

Four consumer segments were generated from the four food lifestyle domains via cluster analysis (Nie and Zepeda

2011). This differs from previous FRL studies that have found five segments. To verify that four segments is the stable number for this data, different starting values and different starting numbers of segments were utilized. In addition, a distance measure was used for estimation instead of matching distance. In all cases, the models converged to a stable solution of four segments.

Following the conventions of the FRL literature (e.g. Buckley et al. 2005), the four resulting segments are called: rational (29.2 %), conservative uninvolved (28.9 %), adventurous (24.1 %), and careless (17.8 %). In this case, two FRL categories, "conservative" and "uninvolved," are combined into a single group, as they have some characteristics of both these groups. It should be noted that while these are the names used in the FRL literature, the instruments that generated them are different, and the resulting number of consumer segments is four, rather than the five generally found with the FRL instrument.

The four segments were coded as a four-point categorical dependent variable for the multivariate analysis. Multinomial logit is used to estimate the marginal effects and standard errors, and to test for significant relationships between the explanatory variables of the Alphabet model and the probability of being in each consumer segment. Following Alphabet theory (Zepeda and Deal 2009), the variables used to examine the probability of being in a particular consumer segment include attitudinal variables (environmental concerns), knowledge (about organic production practices), related habits (environmental affiliation, health practices), demographic characteristics that may influence (family composition, gender, age) or limit choices (education, income) and community characteristics that may limit choices (region, access). See Table 2 for a description of the explanatory variables, their coding, and their mean values. Marginal effects of these explanatory variables are calculated from the multinomial logit analysis. They measure the contribution each explanatory variable has on the probability of being in a consumer segment.

The characteristics of each segment using a Chi-square test and a 5 % level of significance are described as follows. Adventurous consumers are the most interested in food shopping, cooking and eating: 83 % shop at specialty stores, 71 % enjoy cooking very much, and 54 % cook every day. The promotion focus of their ways of shopping and meal preparation is tempered by a largely prevention focus towards product attributes and desired consequences. Healthiness, safety, and freshness are their most valued characteristics of food, and they are the most likely to follow a special diet due to illness, religious reasons, for fitness, or because they are vegetarian.

Compared to adventurous consumers, rational consumers are less promotion focused in terms of ways of shopping and meal preparation. They shop less at specialty

Table 1 Variables used in lifestyle segmentation

Variable	Description (and coding)	Mean %
	Ways of shopping	
Specialty shop	I get my groceries from one or more of the following places on a regular basis: food co-op, health food store, ethnic food store, farmer and my own garden (yes = 1; no = 0)	48.51
Farmers' market	I shop at a farmers' market	
	Never = (0,0)*	27.68
	≤two times per month = (1,0)	55.50
	>two times per month = (1,1)	16.82
CSA member	Member of community supported agriculture (yes = 1; no = 0)	1.94
Recognize label	I have seen USDA's organic label (yes = 1; no = 0)	31.69
	Product attributes	
Freshness	Most important characteristic of food is freshness (yes = 1; no = 0)	50.97
Taste	Most important characteristic of food is taste (yes = 1; no = 0)	45.41
Healthiness	The importance of nutrition/health	
	Not at all important = (0,0)	2.98
	Somewhat important = (1,0)	24.45
	Very important = (1,1)	72.57
Safety	The importance of food safety	
	Not at all important = (0,0)	4.79
	Somewhat important = (1,0)	10.99
	Very important = (1,1)	84.22
Convenience	The importance of convenience	
	Not at all important = (0,0)	12.16
	Somewhat important = (1,0)	59.25
	Very important = (1,1)	28.59
Brand	The importance of brand	
	Not at all important = (0,0)	35.58
	Somewhat important = (1,0)	53.17
	Very important = (1,1)	11.25
Cost	The importance of cost	
	Not at all important = (0,0)	5.69
	Somewhat important = (1,0)	43.99
	Very important = (1,1)	50.32
Shop organic	Buy organic food	
	Never = (0,0)	43.60
	Occasionally = (1,0)	48.51
	Every shopping trip = (1,1)	7.89
	Meal preparation	
Enjoy cooking	The enjoyment of cooking	
	Not at all = (0,0)	10.74
	Somewhat enjoy = (1,0)	46.70
	Very much enjoy = (1,1)	42.56
Cook often	The frequency of preparing meals from raw ingredients	
	<one per week = (0,0,0)	13.07
	Once per week = (1,0,0)	13.06
	Three to five times per week = (1,1,0)	45.67
	Everyday = (1,1,1)	28.20
	Desired consequences	
	Someone in household follows a special diet due to	

Table 1 continued

Variable	Description (and coding)	Mean %
Treat illness	Heart diseases, cancer, diabetes or food allergies. (yes = 1; no = 0)	27.17
Keep fit	Fitness or weight loss concerns (yes = 1; no = 0)	34.02
Vegetarian	Vegetarianism (yes = 1; no = 0)	1.81
Religion	Religious reasons (yes = 1; no = 0)	4.01

* Additive coding. For an ordinal variable V with three levels, two new dummy variables, V1 and V2 are created in cluster analysis. "V1 = 0, V2 = 0" represents the lowest level; "V1 = 1, V2 = 0" represents the median level; "V1 = 1, V2 = 1" represents the highest level

stores (60 %), do not cook as frequently (40 % cook daily), and fewer enjoy cooking very much (54 %). In terms of product attributes, they also are largely oriented to a prevention focus; safety, healthiness, cost, as well as taste, are the characteristics they value most in food.

Neither the conservative uninvolved nor the careless consumers are interested in shopping, cooking or desired consequences. For example, only 10 % of conservative uninvolved consumers and only 3 % of careless consumers cook every day, and both segments are the least likely to follow a special diet for any reason. Product attributes are the only characteristic that matters for both, and their motivational focus is prevention. Conservative uninvolved desire safety, low cost, convenience, and freshness, while only convenience and taste matter to careless consumers.

Organic and local food shopping follows interest in food shopping and cooking. Adventurous consumers are the most likely to be organic or local food shoppers. Nearly a third (32 %) shop at farmers' markets twice a month or more, 16 % buy organic foods every shopping trip, 65 % buy organic foods at least occasionally, and 52 % are familiar with the organic label. Rational consumers are the next most likely to be organic or local food shoppers: 10 % are regular organic shoppers, 56 % buy organic foods occasionally, 33 % recognize the national organic label, and 18 % shop at a farmers' market twice a month or more. Conservative uninvolved consumers are less active organic or local food shoppers: 2 % are regular organic shoppers, 39 % buy organic foods occasionally, 22 % recognize the national organic label, and 10 % shop at a farmers' market twice a month or more. Careless consumers are the least likely to buy organic or local food: 3 % buy organic foods regularly, 30 % occasionally, 17 % recognize the national organic label, and only 6 % shop at farmers' markets twice a month or more.

The multivariate model is estimated with "conservative uninvolved" consumers as the reference group. This segment is chosen as the reference group because it represents one of the largest groups of food shoppers (29 %) in the sample and its demographic characteristics are similar to the population means. In addition, since this segment is relatively inactive in terms of organic or local food

shopping, we can compare it to the active organic or local food shoppers—rational and adventurous consumers—to better assess the differences between those who tend to buy organic or local foods and those who do not. Finally, we wish to contrast conservative uninvolved with careless shoppers to highlight differences between these two segments, since neither are active organic or local food shoppers.

Overall model fit is confirmed using a Chi-square statistic: 190.82 (*p* value < 0.0001). The overall correct prediction rate of the model is 42.17 %; the Alphabet theory variables correctly predict the consumer segments nearly half the time. Adventurous consumers have the best correct prediction rate (46.39 %). The rates for correct predictions for rational, careless, and conservative uninvolved consumers are 39.79, 43.62 and 41.52 %, respectively. This compares very favorably to most attitudinal models; on average they correctly predict behavior about 12 % of the time (Bamberg and Möser 2007).

To examine the correlation of environmental attitudes, organic knowledge and habits on the odds of being in a consumer segment, a reduced model with only demographic and community characteristics was estimated. While correct prediction of the reduced model is 38.81 %, a likelihood ratio test between the full models and the reduced model yields a Chi-squared statistic of 53.82 (*p* value < 0.0001), implying that the full model predicts better. This supports inclusion of environmental attitude, organic knowledge, and habit variables. Table 3 shows the marginal effects of the variables on the probability of being in a particular lifestyle segment. The results are discussed by variable category. Table 4 summarizes the characteristics of the consumer lifestyle segments and the correlations found in the multivariate analysis.

Marginal effects of environmental concerns and behaviors, and organic knowledge

Having high environmental concern (E-concerns) is significantly correlated with a 20 % greater probability of being an adventurous consumer (an active organic and local food shopper), while having low environmental concern is

Table 2 Independent variables used in the multivariate analysis

Variables	Description (coding)	Mean
	Environment-related	
E-concerns	5 point scale of following items: (Cronbach's alpha = 0.72)	2.66
	Wildlife preservation (very concerned = 1; otherwise = 0)	
	Water contamination (very concerned = 1; otherwise = 0)	
	Health problems from pollution (very concerned = 1; otherwise = 0)	
	Energy or resource conservation (very concerned = 1; otherwise = 0)	
	Animal welfare (very concerned = 1; otherwise = 0)	
O-knowledge	5 point scale of following items: (Cronbach's alpha = 0.60)	3.99
	Organic food means	
	Not grown with artificial fertilizers or pesticides (0 = false; 1 = true)	
	Not genetically modified (0 = false; 1 = true)	
	Free of antibiotics (0 = false; 1 = true)	
	Free of artificial growth hormones (0 = false; 1 = true)	
	Not treated with radiation (0 = false; 1 = true)	
E-friendly	Member of environmental group (yes = 1; no = 0)	5.82 %
	Health practice	
Fitness club	Currently a member of a fitness club (yes = 1; no = 0)	25.61%
	Demographics	
Adults	Number of adults in the household	1.95
Kids <5 years	Number of children less than or equal to 5 years old in household	0.25
Kids 6–17 years	Number of children aged 6–17 years in the household	0.48
Female	Female (yes = 1; no = 0)	64.68 %
Age	Age (in 10 years)	4.79
Age2	Square of age (in 10 years)	22.94
Education	Completed 4-year college or higher (yes = 1; otherwise = 0)	41.01
Nonwhite	Race other than white (yes = 1; otherwise = 0)	16.17 %
	Income (yearly)	
Poor	Household income before tax <$15,000 (yes = 1; no = 0)	9.31 %
Low-middle	Household income before tax $15,000–$29,999 (yes = 1; no = 0)	16.04 %
Middle	Household income before tax $30,000–$44,999 (yes = 1; no = 0)	17.59 %
High-middle	Household income before tax $45,000–$75,000 (yes = 1; no = 0)	29.50 %
Rich	Household income before tax >$75,000 (yes = 1; no = 0)	27.55 %
	Community characteristics	
Northeast	Household in the Northeast (yes = 1; no = 0)	18.89 %
Midwest	Household in the Midwest (yes = 1; no = 0)	27.17 %
South	Household in the South (yes = 1; no = 0)	33.38 %
West	Household in the West (yes = 1; no = 0)	20.57 %
No market	There is no farmers' market in my area (yes = 1; no = 0)	21.73 %

significantly correlated with a 19 % greater chance of being a careless consumer. No significant association has been found between environmental concerns and being a rational or a conservative uninvolved consumer.

These results highlight the advantage of segmenting consumers prior to multivariate analysis of extrinsic motivations. They also explain why multivariate analyses of all consumers do not always reveal a strong link between environmental motivations and food purchase behavior. To put it simply, different lifestyle segments have different extrinsic reasons for buying organic and local foods. So, while both adventurous and rational consumers are active organic and local food consumers, they appear to have different motivations. The findings suggest that consumers with keen environmental concerns (prevention focus) are likely to be the most active organic and local food shoppers. This result fits with Wier and Calverly's (2002) findings for the Danish population and is consistent with de Boer et al. (2007) study of consumers' sustainable meat choices.

Table 3 Marginal effects of environmental, health, personal, and community variables on the probability a consumer is in a lifestyle segment

	Rational (29.23 %)		Adventurous (24.06 %)		Careless (17.85 %)		Conservative uninvolved (28.85 %)	
	Marginal	SE	Marginal	SE	Marginal	SE	Marginal	SE
Environment-related								
E-concerns	0.0353	0.0557	0.2055**	0.0515	−0.1948**	0.0420	−0.0460	0.0563
O-knowledge	0.0828	0.0682	0.0490	0.0624	0.0186	0.0495	−0.1505**	0.0618
E-friendly	0.0977	0.0811	0.0396	0.0700	0.0526	0.0716	−0.1899**	0.0573
Health practice								
Fitness club	−0.0407	0.0409	0.1129**	0.0413	−0.0261	0.0305	−0.0460	0.0413
Demographics								
Adults	−0.0172	0.0224	0.0331*	0.0183	−0.0094	0.0183	−0.0066	0.0224
Kids <5 years	0.0580**	0.0294	−0.0166	0.0282	−0.0504*	0.0273	0.0089	0.0306
Kids 6–17 years	0.0487**	0.0195	−0.0186	0.0184	−0.0026	0.0164	−0.0275	0.0213
Female	−0.0218	0.0373	0.0593*	0.0328	−0.0791**	0.0304	0.0415	0.0366
Age	0.1718**	0.0776	0.0198	0.0648	−0.0754	0.0532	−0.1161*	0.0677
Age2	−0.0161**	0.0076	−0.0012	0.0063	0.0061	0.0052	0.0111*	0.0066
Education	0.0280	0.0391	0.0196	0.0356	−0.0116	0.0293	−0.0360	0.0391
Nonwhite	−0.1038**	0.0455	0.1548**	0.0513	−0.1055**	0.0315	0.0545	0.0520
Income								
Poor	0.0021	0.0754	−0.1070**	0.0493	0.0703	0.0735	0.0346	0.0745
Low-middle	−0.0994*	0.0569	−0.0003	0.0531	0.0141	0.0525	0.0855	0.0645
High-middle	−0.0038	0.0527	−0.0787*	0.0426	0.0603	0.0472	0.0222	0.0539
Rich	0.0052	0.0556	−0.0640	0.0450	0.0809	0.0516	−0.0221	0.0562
Community characteristic								
Midwest	0.0540	0.0567	−0.0596	0.0449	0.0600	0.0442	−0.0544	0.0500
South	0.0585	0.0538	−0.0271	0.0442	−0.0153	0.0383	−0.0161	0.0491
West	0.1002*	0.0605	0.0540	0.0523	−0.0468	0.0389	−0.1073**	0.0500
No market	−0.0758*	0.0410	−0.1209**	0.0337	0.1184**	0.0381	0.0783*	0.0435

* $p < 0.10$; ** $p < 0.05$

Low knowledge about organic production practices (O-knowledge) increases the odds by 15 % that a person is in the conservative uninvolved segment (p value = 0.015). This result may be related to the fact that conservative uninvolved shoppers are the least educated among the four segments. Education is often positively associated with one's knowledge about environmental issues (Kollmus and Agyeman 2002). However, lack of knowledge may contribute to, or be the result of conservative uninvolved consumers limited interest in purchasing organic and local foods. Knowledge is not significant in predicting the other segments. This is consistent with Hoogland et al. (2007), who found that consumers tend to have inaccurate knowledge of organic practices, underestimating the value of the organic label.

Similar to knowledge, pro-environmental behavior (E-friendly) is only significant in predicting conservative uninvolved seekers. Members of environmental groups are 15 % less likely to be in the conservative uninvolved segment. The relatively low socioeconomic status of conservative uninvolved consumers may explain why; research

indicates that participation in environmental organizations is highest among people with high income and high levels of education (Pierce et al. 1992).

Marginal effects of non-food health habits

Those belonging to a fitness club are 11 % more likely to be adventurous consumers than those who do not. Since adventurous consumers value the healthiness of food the most, and have the highest percent of individuals on a special diet due to fitness or weight loss concerns, it is not surprising they practice other prevention habits. This reinforces that the finding that the most active organic and local food shoppers have a regulatory focus of prevention.

Marginal effects of demographic variables

Family composition (Adults, Kids <5 years, Kids 6–17 years) has a very small but significant impact on being in a particular consumer segment. The probability of being an

Table 4 Summary of characteristics of US food shopper lifestyle segments

	Adventurous (24.1 %)	Rational (29.2 %)	Conservative-uninvolved (28.9 %)	Careless (17.8 %)
Organic-local food shopper	Most likely	Likely	Less likely	Least likely
Ways of shopping	Most interested	Somewhat interested	Not interested	Not interested
Product attributes	Health, safety, fresh	Safety, low cost	Safety, low cost	Convenience, taste
Meal preparation	Most interested	Somewhat interested	Not interested	Not interested
Desired consequences of food, e.g. special diet	Most interested	Somewhat interested	Not interested	Not interested
Environmental concerns & behaviors	Positively related	No relation	No relation	Negatively related
Nonfood health habits	Positively related	No relation	No relation	No relation
Demographic variables[a]	More than one adult	More children 6–17	–	Fewer kids under 6
	–	Middle-aged	Youngest or oldest	–
	Female	–	–	Male
	Non-White	–	White	White
Income	Not poor	Not low-middle income	–	–
	Not high middle income			
Community characteristics	Farmers' market	Farmers' market	No farmers' market	No farmers' market

[a] Demographic characteristics listed that are significantly associated with each segment

– implies there is no significant difference from the average

adventurous consumer increases by 3 % by having an additional adult in the family. Rational consumers have significantly more children 6–17 years old in their household, while the probability of being a careless consumer decreases by 5 % for an additional child less than 6 years. This is consistent with the finding that organic food shoppers tend to have children living in the household (Thompson and Kidwell 1998). These results imply that being a parent or having another adult in the household suggest a prevention focus.

The age of the consumer (Age, Age2) is often related to his or her family composition. Other things being equal, age is positively related to one's probability of being a rational consumer. The size of the effect decreases as age increases and the effect eventually becomes negative. These findings imply that rational consumers are more likely to be middle-aged, which is why they have on average more children in their households. Conservative uninvolved consumers are significantly younger or older than the sample average (48 years).

Gender (Female) also has a small but significant effect on the probability of being in a particular lifestyle segment. Female food shoppers are nearly 6 % more likely than male food shoppers to be adventurous, and nearly 8 % less likely than males to be careless consumers. Traditionally, women tend to plan meals for the family; in terms of the domains of the FRL model, they may be more physically (shopping, cooking) and emotionally (concerned about safety and healthiness, enjoyment of cooking) involved in food activities.

Overall, race (Nonwhite) has a much larger impact on the probability of being in a particular lifestyle segment than family composition, age, or gender. Members of minority races are on average 15 % more likely than Caucasians to be adventurous, and 10 % less likely to be rational or careless consumers. High representation of minority races among those most active US organic shoppers is consistent with Katsaras et al. (2001). An explanation for this finding is that some minority groups have strong food cultures. In terms of FRL domains, this implies they may be more interested in food attributes and cook more often.

Marginal effects of income

Income (Poor, Low-middle, Middle, High-middle, Rich) has a moderate impact on the probability of being in a lifestyle segment, all other things equal. The income variables correspond roughly to household income quintiles. The coefficient signs for adventurous consumers imply they are most likely to be middle-income ($30,000–$45,000). Rational consumers are significantly less likely to be lower middle class ($15,000–$30,000). The result indicates that segments with high prevalence of organic/local foods shoppers are not necessarily the richest, but very low income is likely to be a barrier to being able to purchase organic and local foods.

Prior research on non-segmented data has yielded conflicting results between income and both organic and local food demand. Some researchers have shown that organic

food demand is linked with higher income (Davies et al. 1995; Tregear et al. 1994; Willer and Yussefi 2004), while others have found no relationship (Goldman and Clancy 1991; Storstad and Bjørkhaug 2003). Conflicting findings have also been reported between local food demand and income. Some researchers have found that local food shoppers have above average incomes (Govindasamy et al. 2002; Kezis et al. 1998; Wolf et al. 2005), while others found income was unrelated to local food (Kolodinsky and Pelch 1997; Onianwa et al. 2005). What the current results show is that income only acts as a barrier for the lowest income households demonstrating the advantage of segmenting consumers to tease out complex relationships between income and food choices.

Marginal effects of community characteristics and constraints

Characteristics of the community are contextual variables that are significantly related to lifestyle. Having no farmers' market (No market) in the area is consistently significant in predicting all four FRL choices. It is also clear that region (Northeast, Midwest, South, West) affects food lifestyle, even when using broad regional measures to represent differences in food availability. Western households are on average 10 % more likely to be rational consumers and nearly 11 % less likely to be conservative uninvolved consumers.

Discussion

This study uses US food shoppers segments adapted from the FRL model, but generated using an independently designed survey instrument. The four consumer segments used in this analysis reflect high to low involvement in organic and local food: adventurous, rational, conservative uninvolved, and careless, following the naming conventions used in the FRL model (Buckley et al. 2005), however consolidating "conservative" and "uninvolved" into a single category. To examine a broader theoretical basis for the lifestyle segments than the means-end chain theory (Brunsø et al. 2004) used as the framework for FRL model, multivariate analysis is conducted with the four segments as dependent variables and extrinsic variables implied by Alphabet theory (Zepeda and Deal 2009). The explanatory variables include environmental attitudes and behavior, organic production knowledge, non-food health habits, and personal and community characteristics. A summary of the characteristics of the consumer lifestyle segments and findings of the multivariate analysis are presented in Table 4.

The resulting model correctly estimates the odds of being in a particular lifestyle segment 42 % of the time. This compares favorably to a meta-analysis of determinants of pro-environmental behavior by Bamberg and Möser (2007) who found that intentions explain only a quarter, and attitudes only an eighth, of the variation in behavior. A likelihood ratio test indicates that the inclusion of environmental attitudes, knowledge, and behaviors, as well as non-food health practices, significantly improves the predictive capacity of the multivariate model. This supports the use of Alphabet theory to examine extrinsic non-food factors that may influence FRL because it provides greater explanatory power than means-end chain theory as a framework for consumer lifestyle segmentation. This implies that we can obtain better predictions of who is buying organic and local foods, and why they are buying them, by including extrinsic and non-food motivations and constraints in a lifestyle segmentation model. The hybrid approach also provides explanations for the many conflicting findings about the motivations of organic and local food consumers; consumers with different food lifestyles are motivated to purchase organic and local foods for different reasons.

Higgins' (1997) Regulatory Focus theory is used to assess the consumer segments and the results of the multivariate analysis. The most active organic and local food shoppers, adventurous consumers (24 % of the sample), have a promotional focus with respect to ways of shopping and cooking methods, a prevention focus with respect to desired consequences, and both with respect to product attributes. The prevention focus with respect to desired consequences is consistent with the findings of de Boer et al. (2007). The significant explanatory variables in the multivariate analysis imply a prevention focus and that context is an important constraint to organic and local food purchase.

Rational consumers (29 %) are the second most active organic and local food shoppers. They have a less pronounced promotion focus for ways of shopping and cooking, and have only a moderate prevention focus in their desired consequences. While product attributes are a mix of prevention and promotion focus, the particular set of attributes is different than for adventurous consumers (cost and taste versus health, safety and freshness). The multivariate analysis reveals that context is significantly related to the probability of being a rational consumer, while regulatory focus is not.

Conservative uninvolved (29 %) and careless (18 %) consumers are unlikely organic and local food shoppers. Product attribute is the only FRL domain that is important to them. The attributes reflect both prevention and promotion regulatory focus (convenience, safety and freshness, and convenience and taste for each segment,

respectively). Multivariate analysis reveals that context and lack of prevention focus increase the likelihood of being in these groups.

The implications of these findings for organic and local foods sales are that the variables in the Alphabet theory, along with FRL domains and regulatory focus, can help target communication to consumer subgroups. For example, environmental concerns regarding food choices will be well received by adventurous consumers, who are the most frequent organic and local shoppers, but not by careless consumers, who are the least likely to buy organic and local foods. In other words, there is motivational compatibility (Levav et al. 2010) for adventurous consumers, but not for careless consumers.

For health practitioners, motivational compatibility is also relevant. The results indicate that adventurous consumers recognize the complementary benefits of physical fitness to their food lifestyle, while the other groups do not. FRL domains provide a simple way for health practitioners to identify effective communication strategies for different groups; for example, people who are enthusiastic about food shopping and cooking are likely to be receptive to messages about diet, exercise, and health. Therefore, they can aim to reinforce the healthy eating and physical activities of the receptive adventurous consumers, and provide more information about the connections between health, food, and exercise to the other segments. For rational consumers, emphasizing exercise and healthy eating as family activities that enhance health would likely be an effective strategy, since they cook frequently and have more children. A focus on convenience is needed for careless and conservative uninvolved consumers.

Of interest to policy makers, community leaders, and health care practitioners is the strong and large relationship between access to fresh food and the consumer segments. The presence of a farmers' market has a strong significant effect on the probability of being in a particular consumer segment. The connection between farmers' markets and lifestyles that enjoy cooking and cook frequently seems logical. However, whether their presence may encourage a change in lifestyle is not so clear-cut, but what is evident and measurable is that their absence is a constraint that significantly increases the probability that a consumer will be a careless or a conservative uninvolved consumer and thus less likely to buy organic or local foods.

Also of interest to policy makers, community leaders, and health practitioners is the effect of income on the probability of being in a consumer segment. Only the lowest quintile of income has a significant ($p = 0.05$ %) adverse effect on the probability of being an adventurous consumer. This supports targeted income support programs aimed at the lowest 20 % of households to improve healthier eating. For this group, targeting support directly

to fresh foods (e.g. farmers' market or CSA coupons) and exercise (e.g. health club memberships) and linking them to health programs or insurance could be a way to bring home the message that diet and exercise affect health. Some private Health Maintenance Organizations in the US already are already using this preventative health strategy by providing incentives in the form of rebates (US$100–200) to members who belong to a CSA (Madison Area CSA Coalition 2011).

What we cannot identify in this study is how one moves from one consumer segment to another; for that, we would need panel data to explore the dynamics of factors affecting lifestyle. However, the results provide insights regarding which groups and what messages or support might facilitate healthier FRLs and purchase of organic and local foods. Higgins' Regulatory Focus theory elucidates the different motivations of the domains adapted from the FRL model and the explanatory variables implied by Alphabet theory.

Overall, as discussed in detail above, this hybrid of a lifestyle segmentation model, Alphabet theory, and Regulatory Focus theory provides insights about what may be limiting people's capacity to buy organic and local foods, and in particular, motivational incompatibilities that differ by lifestyle. The multivariate analysis provides insights regarding how variables such as environmental, health, personal, and community characteristics are related to food lifestyles in general, and organic and local food purchase in particular.

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