MEASURING THE STAGES OF CHANG IN ORGANIC FOOD CONSUMPTION

by

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(Under the Direction of Vicki Freimuth)

ABSTRACT

This study measured consumers' readiness to eat organic food, and examined whether there are differences among the levels of the readiness. The Transtheretical Model (TTM), more specifically the Stages of Change, was employed as framework of the analyses. The respondents of the survey were divided into five stages of change in organic food consumption, and analyzed by statistical methods. The results showed that each stage was motivated by different variables, thus different advertising message strategies were suggested according to consumers' stages of change.

INDEX WORDS: Stages of Change, Transtheorectical Model, Organic Food, Target Segmentation, Advertising Message Strategy, Behavior Change, Health Communication.

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To my parents, Young Kyoung Bae and Kyung Ja Bae

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CHAPTER 1: INTRODUCTION

Over the last few years the organic food industry has been showing the highest levels of growth of all food sectors. In the U.S., the market for organic foods increased 40-fold from 1986 to 1996 (Bourn & Prescott, 2002). The Organic Trade Association (OTA) (2004) reported that the organic products industry has continued to grow at a rate of more than 20 percent for the past 12 years, and is now a $10.8 billion business encompassing both foods and non-food products. Once available only through a scattering of food co-operatives, small specialty stores and stalls at farmer's markets, organic foods are now also available in a variety of chain and natural products stores. Placing organic products in mainstream supermarkets raised awareness of consumers, and ready availability makes it easier for consumers who might not go out of their way to find organic food products.

It was not long before consumers paid attention to organic foods. In the early 1960's compelling evidence emerged that extensive herbicide and insecticide use adversely impacted wildlife and water quality (Dimitri & Greene, 2002). In the 1980s, interest in organic production expanded as media reports alerted consumers about unacceptable levels of pesticides detected on produce, extensive antibiotic and hormone use in animal production, and the increased prevalence of bio-engineered foods (Dimitri

& Greene, 2002). Increasing consumers' interest and market share of organic foods lead to state legislation to protect producers and consumers from fraudulent organic claims. In 1982, California enacted the first organic production law to govern use of the term "organic" for marketing purposes (Semali, 2000)

Today, the National Organic Program (NOP) of the USDA (2002) regulates the use of the term "organic," and products that do not meet its criteria cannot use the USDA organic seal on their products in the U.S. The following criteria are used to assign organic labels:

- 100 percent organic: products containing only organically produced ingredients;
- Organic: products containing 95 percent organically produced ingredients by weight;
- Made with organic ingredients: a product containing more than 70 percent organic ingredients. Up to three of the organically produced ingredients can be specified on the principal display panel of the packaging;
- Processed products containing less than 70 percent organically produced ingredients cannot use the term organic in the principal display panel, but the ingredients organically produced can be specified on the ingredients statement on the information panel. (USDA, 2004, Product composition, para (a), (b), (c), and (d))

According to the Walnut Acres/RoperASW survey, 72 percent of Americans said that if given the choice to purchase a food product either with or without a USDA organic seal, they would purchase the labeled product (Gardyn, 2002). The healthfulness of organic food is arguable (Nazario, 2003). A few studies have shown that organic food is

nutritionally better than conventional food; some researchers argue that this is statistically significant, but the practical effect of some organic food for the body is too small to actually enhance consumers' health (Grayson, 2004). However, it is very clear that organic farming is beneficial for the environment, and ultimately enhances the public's health. As more consumers eat organic food, more conventional farms will be changed to natural farming. Thus, it is desirable for consumers to eat organic food for their health and the environment.

Organic food is not a novel concept in the food industry, but it accounts for only a small part of the food market. It is helpful for the organic food industry to diagnose consumers' readiness to change their dietary behavior to organic food, and suggest appropriate strategies to facilitate organic food consumption.

This study examines the processes that consumers use as they change to include more organic food in their diets. More specifically, it identifies predictors and determinants that discriminate among the stages of change for purchasing organic food by using the Transtheorectical Model (TTM). Consumers will be divided into five stages of change, and I will examine the characteristics of the consumers in each stage, and how the factors that influence organic food consumption play their roles differently in each stage. If the results show that each stage is motivated by different factors, then different

interventions will be needed for each stage. I am hypothesizing in this study that health promotion or advertising for organic food should be tailored for a specific target segment according to the stages of change because the consumers in each stage respond to different factors. By knowing consumers' stages of change, and factors affecting each stage, this study can recommend appropriate interventions including advertising strategies to the organic food industry.

CHAPTER 2: THE TRANSTHEORETICAL MODEL

The Transtheoretical Model (TTM) evolved from research with smoking cessation and the treatment of drug and alcohol addiction. It has recently been applied to various kinds of health behaviors: exercise, low fat diet, radon testing, weight control, condom use for HIV protection, organizational change, use of sunscreens to prevent skin cancer, medical compliance, mammography screening, and stress management (Prochask & Velicer, 1997; Glanz, 1997). While many studies about diet applied the Stages of Change Model for assessing readiness for a low fat diet, weight control, and fruit and vegetable intake, there are no studies that used TTM or Stages of Change Model in analyzing organic food consumption. Consuming organic foods is also a kind of dietary behavior, so those criteria used in diet studies also can be used in this organic food consumption study. This study will test the applicability of the Transtheoretical Model to specific dietary behavior areas, and also aid the organic food industry in extending its market size by using this model as a tool for target segmentation. By knowing people's current stage, researchers can set realistic program goals for health intervention; i.e., movement to the next stage. Based on an assessment of the stage of change, researcher and program providers can tailor messages, strategies, and programs to the appropriate stage (Glanz, 1997).

The TTM has been the basis for developing effective interventions to promote health behavior change. The TTM is an integrative model of behavior change. Key constructs from other theories are integrated in this model and the model describes how people modify a problem behavior or acquire a positive or negative behavior (Prochaska & DiClemente, 1983; Prochaska, DiClemente, & Norcross, 1992; Prochaska & Velicer, 1997). The main construct of the model is the Stages of Change, and the model also includes a series of independent variables and a series of outcome measures (Prochaska & Velicer, 1997).

Stages of Change

Stages of change is the core construct of the transtheoretical model that was developed by Prochaska and his colleagues. The model shows an approach to health promotion that emphasizes

> 1) behavior change viewed as a progression through a series of stages, 2) matching the most relevant independent variables and the most appropriate dependent variables to particular stages of change, 3) designing health promotion interventions that meet the needs of the individual at each stage of change, 4) maximizing impacts on entire populations at risk by employing proactive recruitment and stage-matched, interactive, and individualized interventions, and 5) emphasizing the importance of integrating health promotion programs across multiple channels" (Prochaska & Velicer, 1997, p. 6).

The stages of change model suggests that interventions be different for people in different stages of change. For example, action-oriented interventions may be quite

effective with individuals who are in the preparation or action stages, but these same programs may be ineffective with individuals in precontemplation or contemplation stages (Prochaska, DiClemente, & Norcross, 1992). Prochaska and his collegues did research on when changes occur to understand the underlying structure of behavior change (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1983). They found that individuals modifying addictive behaviors move through a series of stages from precontemplation to maintenance (DiClemente & Prochaska, 1982). They identified five stages of change in addictive behaviors; precontemplation, contemplation, preparation, action, and maintenance (Prochaska & DiClemente, 1982). Table 1 describes each stage of change.

Table 1

Stages of Change Model

Concept	Definition	Application
Precontemplation	Unaware of problem, hasn't thought about change	Increase awareness of need for change, personalize information on risks and benefits.
Contemplation	Thinking about change, in the near future	Motivate, encourage to make specific plans.
Preparation (Decision)	Making a plan to change	Assist with developing concrete action plans, setting gradual goals.
Action	Implementation of specific	Assist with feedback,

	action plans	problem solving, social support, reinforcement.
Maintenance	Continuation of desirable actions, or repeating periodic recommended step(s)	Assist in coping, reminders, finding alternatives, avoiding slips/relapses (as applies).

Note. From *Theory at a Glance: a Guide for Health Promotion Practice,* by K. Glanz, 1997, Bethesda: U.S. Dept. of Health and Human Services, p. 16.

Precontemplation is the stage at which there is no intention to change behavior in the near future, typically within the next six months. Many individuals in this stage are unaware or underaware of their problems (Prochaska & DiClemente, 1982).

Contemplation is the stage in which people are aware that a problem exists and are seriously thinking about overcoming it, but have not yet made a commitment to take action (Prochaska & DiClemente, 1982). People can remain stuck in the contemplation stage for long periods. An important aspect of the contemplation stage is the weighing of the benefits and barriers of the problem and the solution to the problem. Contemplators showed struggle with their positive evaluations of the addictive behavior and effort, barriers, and cost to change the behavior (Prochaska & DiClemente, 1992).

Preparation is a stage that combines intention and behavioral criteria (Glanz, 1997). People in this stage are intending to take action in the next month, and have started to make some changes. Although they have lowered the degree of problem behaviors, they have not yet reached a desired level, such as abstinence from smoking and drug use.

Action is the stage in which individuals modify their behavior, or environment to overcome their problems, and reached certain goals such as abstinence from smoking or eating vegetables regularly (Dunn, 2000). People in the action stage are most visible because this stage requires substantial commitment of cost such as time and effort (Dunn, 2000). People are categorized in the action stage when they have successfully altered the addictive behavior from one day to six months (Dunn, 2000).

Maintenance is the stage in which people maintain behavior changes for at least six months or more (Dunn, 2000). Maintenance was viewed as a static stage, but it is not an absence of change, but a continuation of change (Prochaska & Velicer, 1997).

Stage defines when change occurs and can be used in interventions to show a person where he or she is in the change process. Like all dimensions of the model, stage is a dynamic variable, and people are expected to move from one stage to another. There appear to be differences in how the stages fit the situation for different problem areas (Glanz, 1997). Although stage change is sometimes conceptualized as linear, studies have found that a spiral best expresses stage movement because of the dynamic nature of change (Greene et al. 1999; Glanz 1997). Most people in the action stage do not successfully maintain their changed behavior on their first attempt (Prochaska, DiClement & Norcross, 1992). For example, people who were successful in quitting

smoking made an average of three to four action attempts before their long term maintenance (Prochaska & Velicer, 1997). Thus, the development of change is possibly linear, but this is a rare phenomenon in addictive behavior. Prochaska, DiClemente, and Norcross (1992) suggested a spiral pattern that shows how most people actually move through the stages of change. In this pattern, there is relapse as well as maintenance. People returned to earlier stages, and can remain there. Some of them try again, and make progress or go back to previous stages. Studies show that the vast majority of relapsers recycle back to the contemplation or preparation stages, and they plan for their next attempt (Prochaska & DiClemente, 1984).

Processes of Change

Once the stages of change are found, practitioners need to know what makes consumers move to the next stages. Prochaska, DiClemente, and Norcross (1992) found ten basic processes of change. They defined each process and suggested types of interventions with techniques for each process to facilitate behavior change. Each process involves a broad strategy including several techniques associated with different psychological systems (Dunn, 2000). Table 2 summarizes the change processes and techniques for the processes.

Table 2

Titles, Definitions, and Representative Interventions of the Processes of Change

Process	Definitions: Interventions
Consciousness raising	Increasing information about self and problem: observations, confrontations, interpretations, bibliotherapy
Self-reevaluation	Assessing how one feels and thinks about oneself with respect to a problem: value clarification, imagery, corrective emotional experience
Self-liberation	Choosing and commitment to act or belief in ability to change: decision-making therapy, New Year's resolutions, logotherapy techniques, commitment enhancing techniques
Counterconditioning	Substituting alternatives for problem behaviors: relaxation, desensitization, assertion, positive self-statements
Stimulus control	Avoiding or countering stimuli that elicit problem behaviors: restructuring one's environment (e.g., removing alcohol or fattening foods), avoiding high risk cues, fading techniques
Reinforcement management	Rewarding one's self or being rewarded by others for making changes: contingency contracts, overt and covert reinforcement, self-reward
Helping relationships	Being open and trusting about problems with someone who cares: therapeutic alliance, social support, self-help groups
Dramatic relief	Experiencing and expressing feelings about one's problems and solutions: psychodrama, grieving losses, role playing
Environmental reevaluation	Assessing how one's problem affects physical environment: empathy training, documentaries
Social liberation	Increasing alternatives for nonproblem behaviors available in society: advocating for rights of repressed, empowering, policy interventions

Note. From "In search of how people change" by J. O. Prochaska, C. C. DiClement, & J. C. Norcross, 1992, *American Psychology, 47,* p. 1108.

Integrating Processes and Stages of Change

Effective interventions, which reduce relapse rate and help people make progress in the stages of change, require interventions tailored for each stage. Because certain processes are more effective for moving people toward change at certain stages of readiness than others (Dunn, 2000), it is important to match stages of change with processes of change to tailor interventions. Prochaska, DiClemente, and Norcross (1992) integrated the readiness to change and processes for the stages, and suggested stages of change in which particular processes of change are emphasized.

Table 3

Stages of Change in Which Particular Processes of Change Are Emphasized

Precontemplation	Contemplation	Preparation	Action	Maintenance
Consciousness raising				
Dramatic relief				
Environmental reevaluation				
	Self-reevaluation			
		Self-liberation		
			Reinforcement - management	
			Helping relationships	
			Counterconditioning	
			Stimulus control	

Note. From “The transtheoretical model of health behavior change,” by J. O. Prochaska & W. F. Velicer, 1992, *American Journal of Health Promotion, 12,* p. 43.

An analysis of which stage an individual is in allows selecting appropriate interventions (Dunn, 2000). Cognitive processes of consciousness raising and dramatic relief are more effective in the earlier stages while behavior processes of counterconditioning and stimulus control are effective in the action and maintenance stages.

Decisional Balance (Pros and Cons)

The TTM uses decisional balance to explain behavior change. Decisional balance reflects the individual's weighing of the pros and cons of changing. The decisional balance was developed by Janis and Mann (1977). Their model of decision making includes four categories of pros (instrumental gains for self and others and approval for self and others) and cons (instrumental costs to self and others and disapproval from self and others). In a series of studies on the structure of the decisional balance, a much simpler structure was found - just the pros and cons of changing, not four factors for pros and cons each (Velicer, DiClemente, & Prochaska, 1985). In dietary behavior, Ma et al. (2002) found that decisional balance between the pros and cons and in self-efficacy across the stages were similar for fruit intake and vegetable intake. Precontemplators had higher cons than pros, whereas the opposite was true for respondents in preparation, action, and maintenance. In this study decisional balance will be applied to organic food

consumption. Pros and cons of consuming organic food as discussed in the sections below will be measured.

Pros and Cons of Consuming Organic Food

Pros and cons for purchasing organic food have been identified in the literature: health consciousness factors, environment consciousness factors, and perceived taste/flavor factors, availability, price, knowledge of organic food, distrust in organic food regulators, and trust in conventional food regulators.

Health consciousness

In most studies that explored health-related determinants of organic food consumption, health concern appears as the most important reason for consuming organic food. The relative importance of factors influencing the purchase of organic foods may vary from country to country (Zanoli & Naspetti, 2002; Hutchins & Greenhalgh 1997; Hammitt 1990). Zanoli and Naspetti (2002) reported that all consumers associate organic food with health, and want nourishing products. Frequently, surveys report pesticide residues in food to be more important in the decision to purchase organic food products than concern for the environment as a whole (Beharrell & MacFie, 1991).

Environment consciousness

The results regarding influence of consumers' environmental concerns are mixed. Some studies show that environmental concerns are less important while others show that they are more important when compared to other influencing factors in determining organic food consumption (Goldman and Clancy, 1991; Beharrell & MacFie, 1991; Wandel and Bugge, 1997). Goldman and Clancy (1991) reported that organic food buyers in New York believed that protection of wildlife and water supplies from pesticide contamination was the most important reason for supporting organic agriculture, followed by protection of drinking water supplies from fertilizer contamination and protection of consumers from pesticide residues in food. Wandel and Bugge (1997) found that a group of Norwegian organic consumers identified health and environmental reasons for purchasing organic foods. They also showed that the youngest age group (15-24 years) named consideration for the environment and animal welfare as key reasons for purchasing organic food, while in the older age groups concern for their own health was the most important reason. It is also different from country to country. Consumers of organic food in Germany are more likely to be concerned with environmental issues than those in the U.K. (Beharrell & MacFie, 1991). In a comprehensive study in Netherlands (Schifferstein and Ophuis, 1998), the importance of health and environmental factors in

influencing the decision to purchase organic foods was found to vary with the frequency of purchase. Health was found to be a more important motive for light (incidental) buyers, while environmental reasons were found to be a more important factor for heavy buyers of organic foods. Environmental consciousness will be included as a reason for consuming organic food even though the research evidence is inconsistent.

Hedonistics

Davies, Titterington, & Cochrane (1995) suggested hedonists who believe that premium products must taste better, are one group of consumers of organic food. Perception of taste and flavor of organic food may affect the organic food consumption although there is little consensus that organic produce tastes better than non-organic produce (Davies, Titterington, & Cochrane, 1995).

Trust in regulators of organic food and conventional food

Hammitt (1990) argued that non-buyers of organic food believe governments and food sellers would protect them if pesticides were a threat to health or safely. This argument suggests that the more consumers trust regulators, the less need they have for organic food. Thus, confidence in the conventional food supply will negatively affect consumers' probability of purchasing organic food products. We can also consider the case where consumers do not trust regulators. In this case, they will be more positive

towards organic food. On the other hand, they also can be negative towards organic food because they may doubt that organic food is really grown “organically.” I need to examine both possibilities to confirm the direction of consumers’ attitudes towards organic food.

Attitude toward conventional food

Studies also showed the following specific reasons consumers have for not purchasing organically grown foods: high price, poor availability and lack of time to find retail outlets, unsatisfactory quality, and satisfaction with their current food purchases (Tregear, Dent & McGregor 1994; Wandel & Bugge 1997; Davies, A., Titterington, A. J., & Cochrane, C., 1995). With an increasing supply of organic food, the problem of price and availability may be less important. Unsatisfactory quality is usually caused by appearance, not by characteristics such as nutrition, flavor, or taste.

Self-Efficacy

People’s perception of their confidence and capabilities are predictive of their healthy behavior change. Self-efficacy is the situation-specific confidence that people can cope with situations without relapsing to their unhealthy behavior (Bandura, 1982). Studies found that the perceived efficacy affects the consideration of performing the behavior, the degree of effort the individual invests in changing, and the long-term

maintenance of behavioral change (Bandura, 1982; Prochaska & Velicer, 1997). Degree of self-efficacy is low in early stages while it is high in action and maintenance stages, and the self-efficacy is an important predictor of successful movement toward next stages. This study will include a measure of self-efficacy.

Knowledge of "Organic" Food

Many consumers are unfamiliar with the term "organic," certification systems and organic logos (Tregear, Dent & McGregor 1994; Wandel & Bugge 1997). Organic food is not so diffused yet, so some consumers do not have much knowledge about it. Hutchins and Greenhalgh (1997) said that 90% of respondents claimed to understand the term "organic food", but none of the 100 respondents involved recognized the symbol of the organic food. USDA puts its logo on the organic products which meet its criteria.

Research Questions and Hypotheses

This study applies the TTM to organic food consumption. Although other dietary behavior change studies on weight loss as well as fruit and vegetable intake used the TTM, the model has not been used for behavior change in organic food. Thus, the primary research question is to test the applicability of the TTM to organic food consumption. Also, I investigated whether consumers are divided into stages of change,

what are differences among the stages, and how to move people in lower stages to higher ones.

Research Questions

Can the TTM be used to stage the behavior change of consuming organic food? It is important to divide consumers into different groups of readiness to change their diets to include organic food. I tested whether consumers' change of dietary behavior to include organic foods can be staged according to the TTM. To do that, I tested how closely the readiness of change was related to the actual organic food consumption.

If organic food consumption is divided into stages of change, what are the differences among the stages? The TTM showed that behavior change occurred with an increase in decisional balance and self-efficacy. According to the TTM (Prochaska & Velicer, 1997), decisional balance and self-efficacy are lowest in precontemplation stage, and highest in action or maintenance stage. The differences in the pros and cons, self-efficacy, and knowledge of organic food among the stages of change were investigated. It is important to find out in what stages pros and cons, self-efficacy, and knowledge are statistically significant predictors, and in what stages they are not, as this information enables practitioners to tailor specific intervention strategies for target groups. Demographics were also considered variables that may have relationships with the stages

of change, so these were also measured. If there were differences among stages of change, it is important to identify the variables, which differentiate consumers among the stages of change.

Hypotheses

Hypothesis 1

Hypothesis 1 predicted that consumers' change of dietary behavior to include organic foods could be staged according to the TTM. The construct of the TTM predicts that there are positive correlations between stages of change and actual levels of behavior, and self-efficacy. The behavior focused on in this study is organic food consumption, and it was measured by frequency of eating organic food, and percentage of food money devoted to organic food. Thus, it was hypothesized that there are positive correlations between stages of change and frequency of eating organic food, stages of change and percentage of food money devoted to organic food, and stages of change and self-efficacy.

Research hypothesis 1- 1: There is a positive correlation between the stages of change and the levels of consumption.

Research hypothesis 1- 2: There is a positive correlation between the stages of change and the decisional balance score.

Research hypothesis 1- 3: There is a positive correlation between the stages of change and the self-efficacy.

Hypothesis 2

Hypothesis 2 examines whether there are differences in decisional balance score, its components, and self-efficacy among the stages of change. The components of the decisional balance included health consciousness, environment consciousness, hedonistics, convenience, trust in conventional food regulators, trust in organic food regulators, attitude toward conventional food, willingness to pay more for organic food, and price consciousness. If there were differences among the stages, it was also investigated what stages were different from each other.

Research hypothesis 2 – 1 – 1: There is difference in decisional balance score among the stages of change.

Research hypothesis 2 – 1 – 2: There is difference in health consciousness among the stages of change.

Research hypothesis 2 – 1 – 3: There is difference in environment consciousness among the stages of change.

Research hypothesis 2 – 1 – 4: There is difference in hedonistics among the stages of change.

Research hypothesis 2 – 1 – 5: There is difference in convenience among the stages of change.

Research hypothesis 2 – 1 – 6: There is difference in trust in conventional food regulators among the stages of change.

Research hypothesis 2 – 1 – 7: There is difference in trust in organic food regulators among the stages of change.

Research hypothesis 2 – 1 – 8: There is difference in attitude toward conventional food among the stages of change.

Research hypothesis 2 – 1 – 9: There is difference in willingness to pay more for organic food among the stages of change.

Research hypothesis 2 – 1 – 10: There is difference in price consciousness among the stages of change.

Research hypothesis 2 – 2: There is difference in self-efficacy among the stages of change.

Hypothesis 3

Hypothesis 3 examines whether there are differences in demographics among the stages of change. Demographics were analyzed with Chi-square analysis and ANOVA. The variables of gender, marital status, education level, and presence of children in

households were analyzed with Pearson chi-square analysis (hypothesis 3 – 1). The variables of age, income, household size, and the number of children in households under 6 were analyzed with one-way ANOVA (hypothesis 3 – 2).

Research hypothesis 3 – 1 - 1: There is significant difference in gender, marital status, education level, and children in households among stages of change.

Research hypothesis 3 – 1 - 2: There is difference in marital status among stages of change.

Research hypothesis 3 – 1 - 3: There is difference in education level among stages of change.

Research hypothesis 3 – 1 - 4: There is difference in whether or not children under 6 live in households among stages of change.

Research hypothesis 3 – 2 - 1: There is difference in age among stages of change.

Research hypothesis 3 – 2 - 2: There is difference in income among stages of change.

Research hypothesis 3 – 2 - 3: There is difference in household size among stages of change.

Research hypothesis 3 – 2 - 4: There is difference in the number of children under 6 in households among stages of change.

Hypothesis 4

Hypothesis 4 examines what variables discriminate among the stages of change. Hypothesis 4: There are statistically significant predictors that discriminate consumers' stages of change in organic food consumption.

CHAPTER 3: RESEARCH METHODS

Survey Methodology

Survey methodology was used in this study. The survey was distributed by e-mail linked to a survey webpage, so the recipients were requested to complete the survey online.

There has been no previous application of TTM to organic food consumption even though it has been applied to dietary behavior. Thus, pilot studies were conducted to test the appropriateness of the expressions adapted and modified from the previous studies using the TTM, and to see if they were useful for behavior change in organic food consumption. The pilot studies also helped to test the levels of reliability of the measures in the survey.

Two pilot tests and one main survey were conducted. The pilot tests were used to check the levels of internal consistency reliability of measures and distributions of stages of change. The first pilot survey was conducted to assure that respondents understood the survey questionnaires and the terminology in the survey was appropriate to organic food consumption. The second pilot test was conducted to check the levels of the internal consistency reliability of the measures of variables and the stages of change. After a few

questions were added for some variables that showed low internal consistency reliability, the main survey was conducted.

Samples

One goal of this study is to apply the stages of change model to organic food consumption, and both organic food consumers and non-organic food consumers were requested to participate in the surveys.

For the first pilot test, convenience samples of undergraduate class members of the Advertising Department in the University of Georgia were used. For the second pilot test and the main study, graduate students, staff, and faculty members in the University of Georgia who were 27 years old or older were used. The first pilot test results showed that there was only one participant in the action stage, and no one in the maintenance stage out of 17 participants. This study requires both active organic food consumers as well as non-consumers of organic food. To get more active organic food consumers with the limited number of participants, a criterion was set for sampling: age of 27 or older. The main organic consumers are married, people in their 30s – 40s (Davies, Titterington, & Cochrane, 1995). The age criterion was expected to raise the proportion of active organic consumers in the samples. The sample was limited to graduate students, faculty, and staff in the University of Georgia. Two thousand and five

hundred individuals were selected at random by the Office of Institutional Research in the University of Georgia. Five hundred of them were randomly selected, and used in the second pilot test, and the rest of the 2,000 sample were used in the main survey.

One way ANOVA and discriminant analysis were used to find out how the variables that affect organic food consumption are different in each stage, and what variables discriminate consumers' stages of change. This study is interested in a medium effect size (f = .25), and the maximum number of levels divided is five (u = 4). According to the power chart for one way ANOVA, thirty nine samples are needed for each level (stage) to get statistical power of .80. In total, at least 195 (39 participants for each stage) are needed in this study. However, it was not probable that participants would be distributed evenly to each stage. Thus, more participants were needed to get at least 39 participants in each stage, and sample size of 400 might make each stage have at least 39 respondents.

In addition, the number of individuals to whom the survey should be distributed was calculated to get 400 responses. According to Sheehan (2001), the average response rate of email survey from 1986 to 2000 was 36.83%, but in 1999 and 2000, the most recent years in the study, the response rates were 27.5% and 24%. The number of

individuals to whom the survey would be distributed were calculated based on the response rate of 20% to get at least 400 responses.

Measures

Variables used in this study were pros and cons (decisional balance) of consuming organic food, knowledge of organic food, self-efficacy, demographics, level of organic food consumption, and the stages of change. Some questions drawn from prior studies were modified, and some of the others were developed for this study. In addition, media use was measured to find out an effective media planning strategy for advertising organic food.

The levels of the internal reliability of the questionnaires that were modified or developed in this study were checked with the second pilot test. The questions for the variables that had Cronbach's alphas of lower than .70 were modified and more questions were added for the main survey.

Decisional Balance (Pros and Cons)

The pros and cons of organic food consumption include such items as health consciousness, environment consciousness, hedonistics, trust in the regulators of organic food, trust in the regulators of conventional food, convenience, willingness to pay more for organic food, and price consciousness. Each item response for the pros and cons

questionnaires is evaluated on a five-point Likert scale with 1 being strongly disagree to 5 being strongly agree.

Health Consciousness

Schifferstein and Oude Ophuis (1998) argued that organic food consumers tend to be health conscious and believe that the type of food they choose to eat affects their health. The measure of individual health consciousness was drawn from Schifferstein and Ophuis (1998)'s study. Health-related variables that affect organic food consumption were drawn from the studies of Zanoli and Naspetti (2002), and Saba and Messina (2003). The measures drawn from Lockie et al (2004)'s study showed reliability (Cronbach's alpha) of .82, and they were modified and some measures that did not seem appropriate for organic food were deleted for this study.

Table 4

Questionnaires for Health Consciousness

Questionnaire	Score
- Organic food is very safe.	1 2 3 4 5
- Organic food is very nutritious.	1 2 3 4 5
- Organic food keeps me healthy.	1 2 3 4 5
- All and all, it is good for my health to eat organic food.	1 2 3 4 5
*- My health is so valuable to me that I am prepared to sacrifice many things for it.	1 2 3 4 5

* Deleted in the final analysis due to low reliability

Environment Consciousness

Environment consciousness measures a consumer's belief that we should protect the environment from contamination, and the perception that consuming organic food is protective. The measures were drawn from Soler, Gil, and Sanchez (2002)'s study and Saba and Messina (2003)'s study.

Table 5

Questionnaires for Environment Consciousness

Questionnaire	Score				
- By eating organic food I get food that is environmentally friendly.	1	2	3	4	5
- Consuming organic food is helpful in protecting environment from contamination.	1	2	3	4	5
*- Agriculture should reduce the use of chemicals to protect environment.	1	2	3	4	5

* Deleted in the final analysis due to low reliability

Hedonistics

This measures how important a consumer thinks it is to enjoy food with taste, freshness, and flavor. The measure of perceived taste of organic food was drawn from Saba and Messina (2003)'s study, and the other measures of flavor, freshness, and level of enjoying food were developed.

Table 6

Questionnaires for Hedonistics

Questionnaire	Score
- By eating organic food I get food that tastes better.	1 2 3 4 5
- By eating organic food I get food that has a better flavor.	1 2 3 4 5
- By eating organic food I get food that is fresher.	1 2 3 4 5
*- I enjoy eating food.	1 2 3 4 5

* Deleted in the final analysis due to low reliability

Trust in Regulators of Conventional Food

This measures consumers' attitudes toward the regulators of conventional food. The measures of trust in the regulator of conventional food were drawn from Squires, Juric, and Cornwell (2001)'s study, which showed Cronbach's alpha coefficient of .72, and three out of 5 measures that were appropriate for organic food consumption and showed high loadings in their study were adopted for this study. These are presented in Table 7.

Table 7

Questionnaires for Trust in Regulators of Conventional Food

Questionnaire	Score
- The country has high standards for food safety.	1 2 3 4 5
- The government food regulations reflect what's best for everyone.	1 2 3 4 5
- The government sets and monitors food safety guidelines well.	1 2 3 4 5

Trust in Regulators of Organic Food

This measures consumers' attitudes toward the regulators and manufacturers of organic food. The measures of trust in the regulators of organic food were developed for this study, and are presented in Table 8.

Table 8

Questionnaires for Trust in Regulators of Organic Food

Questionnaire	Score
- I believe the regulator of organic food manages the quality of organic food appropriately.	1 2 3 4 5
- I think organic farmers meet the criteria of organic food.	1 2 3 4 5
[a]- The organic food industry is well regulated.	1 2 3 4 5
[a] - Organic farmers follow the standards of producing organic food.	1 2 3 4 5

[a] Added for the main survey

Willingness to Pay More for Organic Food

The measures of willingness to pay more for organic food were drawn from Soler, Gil, and Sanchez (2002)'s study, and Lockie, Lyons, Lawrence, and Grice (2004)'s study.

Table 9

Questionnaires for Willingness to Pay More for Organic Food

Questionnaire	Score
- It is fair to pay more for organic food.	1 2 3 4 5
- I am willing to pay more for organic food.	1 2 3 4 5
* [a] - Prices of organic food are higher than they should be.	1 2 3 4 5

* Deleted in the final analysis due to low reliability

[a] Added for the main survey

Price Consciousness

A recent survey showed that price is one of the key factors accounting for consumers purchase of organic food (Whole Foods Market, 2003). Price consciousness measures a consumer's attention to a price and priority of saving money compared with the effort of searching a low price. The price sensitivity measure was drawn from Soler, Gil, and Sanchez (2002)'s study and Marketing handbook (Bearden & Netemeyer, 1999).

Table 10

Questionnaires for Price Consciousness

Questionnaire	Score				
[a]-I am not willing to take extra efforts to find lower prices.	1	2	3	4	5
- I pay attention to price offers.	1	2	3	4	5
[a]- I would never shop at more than one store to find low prices.	1	2	3	4	5
[a]- The money saved by finding lower prices is usually not worth the time and effort.	1	2	3	4	5
[a] - I will grocery shop at more than one store to take advantage of low prices	1	2	3	4	5
*- I buy more organic food if it is on sale.	1	2	3	4	5
*- I limit the amount of organic food I buy so that my grocery money goes farther.	1	2	3	4	5

* Deleted in the final analysis due to low reliability

[a] Added for the main survey

Convenience

Convenience measures how easily one can get organic food. The measures were drawn from Lockie, Lyons, Lawrence, and Grice (2004)'s study, and Ma, Betts, and Horacek (2002)'s study.

Table 11

Questionnaires for Convenience

Questionnaire	Score
- It is difficult to find an organic food store.	1 2 3 4 5
- It is not easy to get to an organic food store (distance).	1 2 3 4 5

Attitude toward Conventional Food

Attitudes toward conventional food measures safety and satisfaction with conventional food, and were developed for this study.

Table 12

Questionnaires for Attitude toward Conventional Food

Questionnaire	Score
- It is safe to take conventional food	1 2 3 4 5
- I am satisfied with conventional food, and feel there are no problems with it.	1 2 3 4 5

Self-efficacy

Self-efficacy measures consumers' confidence in changing their diets to organic diets. Bandura (1982) argued that individuals with high confidence in their ability or

efficacy expectations for a given task will be more likely to engage in that situation-specific task. The questionnaires were drawn from Ma, Betts, and Horacek (2002)'s study that showed internal consistency coefficient of .86. The item response is evaluated on a five-point Likert scale with 1 being strongly disagree to 5 being strongly agree.

Table 13

Questionnaire for Self-efficacy

Questionnaire	Score				
- I can keep organic food at hand/readily available.	1	2	3	4	5
- I have time to shop for organic food.	1	2	3	4	5
- I can shop for a variety of organic food.	1	2	3	4	5
- If I spend more time at home, I can eat more of organic food.	1	2	3	4	5
- I am confident I will eat more organic food or will eat organic food regularly.	1	2	3	4	5

Knowledge of "Organic" Food

The knowledge measures asked how much consumers know about "organic" food, and its management. The knowledge questions, which were developed for this study, measure a consumer's understanding of the definition of "organic", and knowledge of the fact that organic food is regulated by USDA. Each item response is evaluated on a five-point Likert scale with 1 being strongly disagree to 5 being strongly agree.

Table 14

Questionnaires for Knowledge of "Organic" Food

Questionnaire	Score				
*- I am knowledgeable about organic food.	1	2	3	4	5
*[a]- The use of the words "natural," and "hormone-free," is not regulated by the USDA, and can be used without certification.	1	2	3	4	5
* [a] - The use of the word "organic" is not regulated by the USDA, and can be used without certification.	1	2	3	4	5
*- The products containing less than 100 % organically produced ingredients cannot use the term organic in the display panel.	1	2	3	4	5
*- Experts approved by the government inspect the organic farms where organic food is produced to make sure the farmers follow USDA requirement.	1	2	3	4	5
*- Only the products that meet the government criteria can be put the USDA organic seal.	1	2	3	4	5

* Deleted in the final analysis due to low reliability

[a] Added for the main survey

Media Use

One of the goals of this study is to contribute to an effective advertising strategy for organic food consumption. The previously discussed variables of pros and cons, and self-efficacy can contribute to designing a message strategy. The media use of consumers will show what media are more effective in reaching consumers in each stage of change. The media use questions included hours of watching TV, listening to radio, reading newspapers and magazines, using the Internet, experience of looking for information of organic food and general food. The media use questionnaires were drawn from the study

of health information trends survey (National Cancer Institute, 2005). Table 15 presents the questions for media use.

Table 15

Media Use

Questionnaire	Hour(s)
- How many hours do you watch television in a typical day?	( ) hours
- How many hours do you listen to the radio in a typical day?	( ) hours
- How many hours do you read a newspaper in a typical day?	( ) hours
- How many hours do you use Internet in a typical day?	( ) hours
- How many hours do you read a magazine in a typical day?	( ) hours
- Have you ever looked for information about any food from any source?	Yes ( ) No ( )
- If yes, what do you think is the most useful source? (please check only one)	
1) books, 2) brochures, pamphlets, etc., 3) family, 4) friend/co-worker, 5) internet, 6) library, 7) magazines, 8) newspapers, 9) radio, 10) telephone information number (1-800 number), 11) television, 12) other ( )	
- If you used Internet, where did you look first on the Web?	
1) search engine, 2) online magazine, 3) online newspaper, 4) online television, 5) online radio, 6) online community, 7) company homepage, 8) organic food related organization homepage, 9) other ( )	
- If you have not searched for information on food, where would you like to look first when you need it?	
1) books, 2) brochures, pamphlets, etc., 3) family, 4) friend/co-worker, 5) internet, 6) library, 7) magazines, 8) newspapers, 9) radio, 10) telephone information number (1-800 number), 11) television, 12) other ( )	
- Have you ever looked for information about organic food from any source?	Yes ( ) No ( )

- If yes, where did you look first? 1) books, 2) brochures, pamphlets, etc., 3) family, 4) friend/co-worker, 5) internet, 6) library, 7) magazines, 8) newspapers, 9) radio, 10) telephone information number (1-800 number), 11) television, 12) other ( )

Demographics

Demographics include gender, age, income, ethnicity, marital status, education level, and household size, and the number of children under 6 in households. Studies have shown that there are differences in organic food consumption among these demographic groups. Females with high income and households with children are more likely to consume organic foods (Davies, Titterington, & Cochrane, 1995). Also, Jolly (1991) argued that older consumers are more likely to buy organic food than younger people in California, but Goldman and Clancy (1991) reported that income and age were not important factors in distinguishing between organic food consumers and non-consumers.

Table 16

Demographics

Item	Questionnaire
Gender	- What is your gender? Male ( ) Female ( )
Age	- What is your age? ( )
Education	- What is your last or current level of enrollment in or completion of an educational program? 1) Some high school 2) High school graduate, 3) College student, 4)

	College graduate, 5) Master's student, 6) Master's Degree, 6) Doctoral student, 7) Doctoral degree, 8) Student in professional program or certificate program, 9) others (please specify)
Department	- What department are you in? ( )
Status	- What is your status in the University of Georgia? 1) College student 2) graduate student 3) faculty 4) staff 5) other
Marital status	- Are you married? Yes ( ) No ( )
Household size	- What is size of your current household? 1) One 2) two 3) three 4) four 5) five or more
Children under 6	How many children in your household are under age 6? 1) Zero 2) one 3) two 4) three 5) four 6) five or more
Ethnicity	- What is your ethnicity? 1) White, 2) African American, 3) Hispanic, 4) Asian American, 5) other ( )
Income	- What is your family income? 1) less than $25,000, 2) $25,000-$49,999, 3) $50,000-$74,999, 4) $75,000-$99,999, 4) $100,000 or more

Stages of Change

According to the TTM, stages of change measured a consumer's readiness to change behavior. This study adapted items from McConnaughy, Prochaska, and Velicer (1983), and McConnaughy, DiClement, Prochaska, and Velicer (1989)'s four stage scales, five stage scales of the University of Rhode Island (2005) for measuring exercise behavior, and Ma, Betts, and Horacek (2001)'s five stage scales for fruit and vegetable intake. Items irrelevant to organic food consumption were eliminated, and the remaining items were modified for operationalizing organic food consumption stages. McConnaughy, Prochaska, and Velicer (1983) generated 165 items measuring the five

stages. Then they reduced the number of items to 32 by retaining only the more reliable items. In the process of reducing items, preparation stage was eliminated because nine of its 10 items loaded on both preparation and action stage. They concluded that preparation was not measuring a distinct stage in this study, but they suggested in the next study that the decision stage (preparation stage) can be a distinct stage (McConnaughy, DiClement, Prochaska, and Velicer, 1989). They tested reliability of the measures of the stages of change. The coefficients of Cronbach's alphas ranged from .88 (precontemplation, contemplation, and action) to .89 (maintenance). In the follow up study (McConnaughy, DiClement, Prochaska, and Velicer, 1989), the coefficient alphas ranged from .79 to .84 (precontemplation, .79; contemplation, .84; action, .84; and maintenance, .82). The items that McConnaughy, DiClement, Prochaska, and Velicer (1989) developed were applied to dietary behavior change. Ma et al. (2001) modified McConnaughy et al. (1989)'s items and applied them to fruit and vegetable intake. In terms of internal reliability, relatively low Cronbach's alpha coefficients were found for items in the precontemplation scale (.47 for fruits and .46 for vegetables). The Cronbach's alpha coefficients were from .57 to .72 in the other four stage scales, and they argued that these Cronbach's alpha coefficients showed moderately high internal reliability among the items of each scale. Preparation stage is also one of the stages of change analyzed in their study, so five-stage

scales are used. In this study, the questionnaires for the stages of precontemplation, contemplation, action, and maintenance were drawn and modified from McConnaughy, DiClement, Prochaska, and Velicer (1989)'s study and the University of Rhode Island (2005). Ma, Betts, and Horacek (2001)'s questions for the preparation stage (Cronbach's alpha: .62) were modified and used for the preparation stage in this study.

The response to each item was evaluated on a five-point Likert scale with 1 being strongly disagree to 5 being strongly agree.

Table 17

Questionnaires for Stages of Change in Organic Food Consumption

Stage	Stage Scale Items
Precontemplation	- As far as I am concerned, I don't have any problem with eating only conventional food. - I don't eat organic food and right now I don't care. - I would rather live with eating too little organic food than to try to eat more. - I could eat organic food regularly, but I don't plan to. - I may not eat enough organic food, but why spend time thinking about it? *- Talking about changing what you eat is boring. Why can't people just eat the amount of organic food they want and forget about it?
Contemplation	- I eat too little or no organic food, and really think I should eat some. - I wish I had more ideas on how to eat more organic food. - I have been thinking that I might want to start eating organic food.

	- I have been thinking about whether I will be able to eat organic food.
	- I hope that someone will have some good advice for me to help me eat more organic food.
	- I really think I should work on getting started in eating (more) organic food in the next 6 months.
Decision/ Determination	- I have started eating more organic food, but I'd like some help to get organic food.
	- Eating organic food seems difficult, but I am going to try in the next month.
	- I am going to start eating (more) organic food in the next 30 days.
	- I have thought about how much money I would spend for organic food, where I would buy it, or what kinds I would buy.
Action	- I am finally eating organic food.
	- I have started eating organic food within last 6 months.
	- Anyone can talk about eating more organic food; I'm actually doing it.
	- I have started to eat organic food regularly, and I plan to continue.
	- I am actively working at eating organic food.
	*- At times an organic diet is difficult, but I'm working on it.
	*- Recently, I started eating organic food.
Maintenance	- I have been successful at including organic food in my diet and I plan to continue.
	- I've been eating organic food regularly for over 6 months and want to continue.
	- I have managed to continue eating organic food through the last 6 months.
	- I have completed 6 months of including organic food in my diet.
	- After 6 months, I still keep working to eat organic food regularly.
	*- It worries me that I might slip back to a diet without organic food.
	- I may need a boost right now to help me continue to include organic food in my diet.

* Deleted in the final analysis due to low reliability

Level of Organic Food Consumption

The level of organic food consumption was measured with 2 items: frequency of eating organic foods and percentage of food budget spent on organic food. It was also examined what kinds of organic food were consumed by respondents.

Table 18

Questionnaires for Consumption level

Item	Questionnaire
Frequency	- How many times do you eat organic food? 1) seven times a week or more, 2) 4-6 times a week, 3) 2-3 times a week, 3) once a week, 4) once a couple of weeks, 5) once a month, 6) less than once a month
Percentage	- What percentage of food expenditure is devoted to organic food? 1) Below 1%, 2) 1 – 2.99%, 3) 3 – 4.99%, 2) 5 – 9.99%, 3) 10 – 19.99%, 4) 20 – 29.99%, 5) 30% or more
Food category	- What kind of organic food do you eat? 1) dairy food 2)produce 3) non-dairy beverage (soy) 4) juice 5) meat/poultry 6) snacks 7) frozen food 8) bread 9) canned goods 10) others ( )

Data Collection

The first pilot survey was distributed to class members of the Advertising Department at the University of Georgia on Feb. 22nd, 2005, and the survey webpage was closed 10 days later. Seventeen responses were collected out of 19 students who agreed to participate in the survey. After collecting the data, feedback on the survey was gathered in the class.

The second pilot survey was distributed to the 500 graduate students, faculty, and staff at the University of Georgia. The first email that has a link to the survey webpage was sent on Mar. 30th, 2005, and a follow-up email encouraging participation in the survey was sent on Apr. 5th, 2005. The survey webpage was closed on Apr. 7th, 2005. Ninety nine recipients out of 500 (19.80 %) participated in the survey, and 20 responses were incompletes, which were removed in the data set.

The main survey was distributed to the 2,000 graduate students, faculty, and staff aged 27 or older at the University of Georgia. It was sent on Apr. 13th, 2005, and the webpage was closed on Apr. 25th, 2005. There was a follow-up email on Apr 19th, 2005. Three hundred and ninety five recipients out of 2,000 (19.75 %) participated in the survey. Sixty four out of 395 responses were not complete and were removed from the data set.

CHAPTER 4: RESULTS

There were two pilot surveys and one main survey for this study. The survey data were analyzed with the SPSS software.

Pilot Tests

Pilot test 1

The first pilot survey was conducted to check appropriateness of the language in the survey, and distribution of respondents in each stage. Many of the survey questionnaires were drawn from studies of dietary and exercise behavior, and the terminology needed to be checked before applying them to organic food consumption behavior. Convenience samples of 17 undergraduate students in a class in the Advertising Department at the University of Georgia participated in the survey online. After collecting the data, the researcher got feedback in the class from the respondents. A few questions and statements in the survey were modified based on the feedback to make the questions and statements in the survey clearer and more appropriate for organic food. The distribution of the samples across the stages of change was checked, and it was found to be heavily skewed. There was only one respondent in the action and no one in maintenance stage out of 14 respondents who were classified by the stage measures. Table 19 shows the distribution of the participants in each stage in pilot test 1.

Table 19

Distribution of the Samples in Each Stage in Pilot Test 1

Stage	Precontem-plation	Contem-plation	Decision	Action	Maintenance
Observations	7	3	3	1	0

Pilot test 2

The pilot test 1 showed that undergraduate students were not likely to be distributed across all stages of change. It would enhance the number of active organic food consumers to include more older and married respondents because a prior study showed that the consumers who were in their 40s, and had children were more likely to purchase organic food (Davis, Titterington, & Cochrane, 1995). Thus, participants in all subsequent data collection were limited to graduate students, faculty, and staff 27 years or older in the University to get more active organic food consumers.

An email asking for participation in the survey and linked to the survey webpage was sent to a random sample of 500 graduate students, faculty, and staff at the University of Georgia who were 27 or older. Ninety nine of them (19.80 %) participated in the second pilot survey. It is interesting to examine the response rate of each day in the survey period. These data can provide researchers with suggestions for the length of time to keep a survey link active. Figure 1 shows the response rate each day.

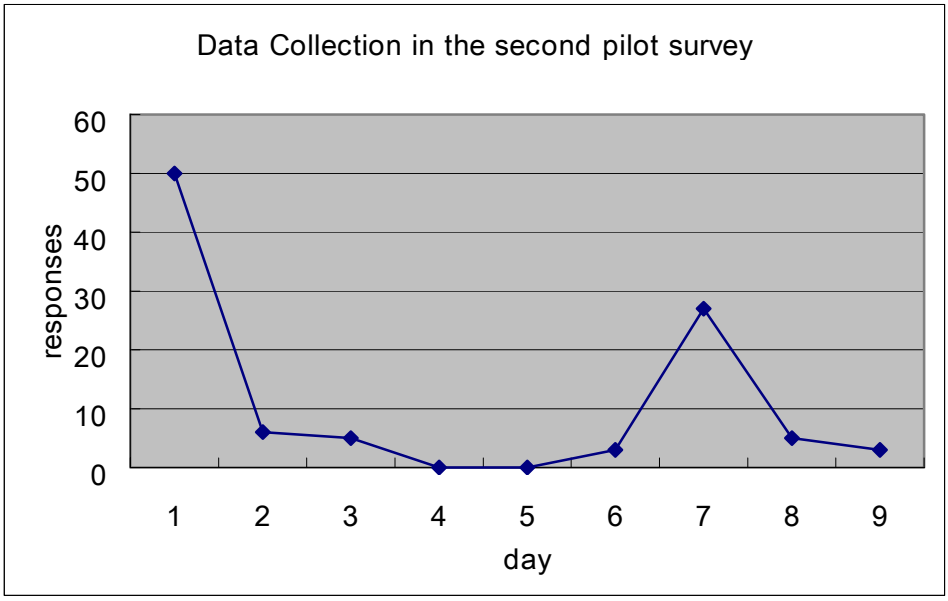

Figure 1. The number of responses of each day in the 2nd pilot survey

The response rate was highest 50.50 % (50 responses out of 99) on the first day of distribution of the survey. As time went on, the response rate decreased. The fourth and the fifth day were Saturday and Sunday, and no responses were gathered. The 7th day was the day that a follow-up email was sent, and the number of responses surged to 27 (27.27%). The response rate rapidly decreased after that. Overall the response rate was highest on the first day the email was distributed, and on the day the reminder email was sent. Apparently the recipients decided to participate when they got the email, and did not care after that. Also, even though they decided not to participate in the survey at the time of the first email, a good proportion of the recipients changed their mind and participated by the next email. Thus, it was found that sending a follow-up email was much more effective than just waiting.

Cronbach's alpha coefficients were calculated to check the internal consistency reliability of the measures of the variables. Table 20 shows Cronbach's alpha coefficients of measures of each variable and stage of change.

Table 20

Internal Consistency Reliability of Decisional Balance Components of the 2nd Pilot Survey

Variable	Component	Cronbach's alpha coefficient	Component	Cronbach's alpha coefficient
Decisional Balance (Pros and Cons)	Health consciousness	.718	Convenience	.753
	Environment consciousness	.790	Trust in the regulators of conventional food	.888
	Hedonistics	.767	Price consciousness	.555
	Willingness to pay more for organic food	.591	Attitude toward conventional food	.869
	Trust in the regulators of organic food	.210		
Knowledge and Self-efficacy	Knowledge	.340	Self-efficacy	.855
Stages of Change	Precontemplation	.898.	Action	.875
	Contemplation	.859	Maintenance	.882
	Decision	.701		

Many measures for each variable were higher than .70, but some of other measures showed very low reliability. Thus, a few questions were added for the variables

of trust in the regulators of organic food, price consciousness, and knowledge variables for the main survey.

The distribution of respondents in each stage of change was examined. Table 21 shows the distribution.

Table 21

Distribution of the Samples in Each Stage in Pilot Test 2

Stage	Frequency	Percent
Precontemplation	32	48.5
Contemplation	11	16.7
Decision	1	1.5
Action	3	4.5
Maintenance	19	28.8
Sum	66	100.0
Missing	13	
Total	79	

There were more active organic consumers in the second pilot test than in the first pilot test, but there were still few respondents in decision and action stages.

Main Survey

Three hundred and ninety five subjects out of 2,000 participated in the main survey. Sixty four out of 395 responses were incompletes, and deleted in the data set. The response rate was 19.75 %, and the rate of the valid responses was 16.55 %. Total responses of 331 were analyzed with several missing values in the data set. The response

rate of each day in the period of the main survey was examined. Figure 2 shows the trend of the response rate.

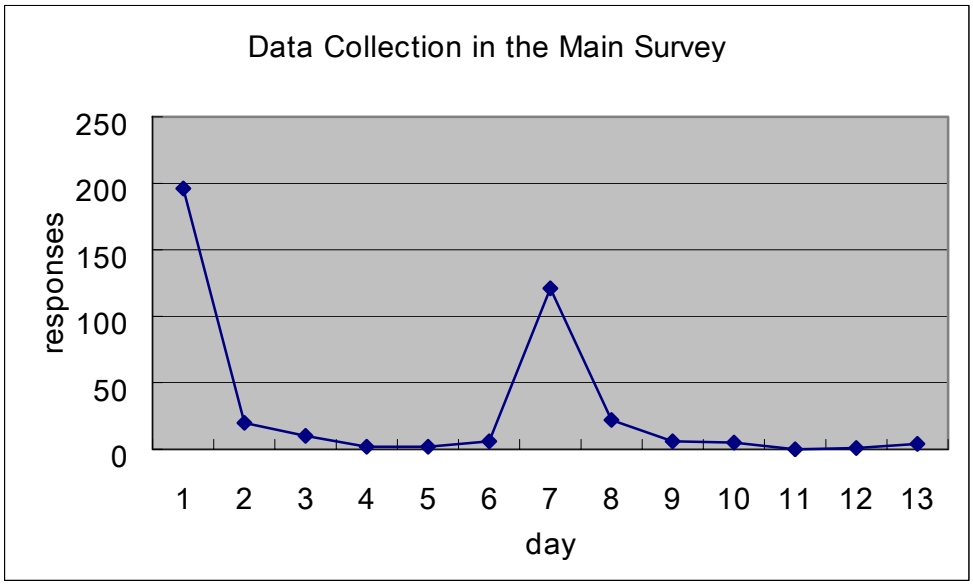

Figure 2. Response Rate of Each Day in the Main Survey

The figure shows the same pattern as that of the 2nd pilot survey. The recipients usually participated in the survey on the day they got the email, which has the link to the survey webpage. The response rate rapidly decreased after the distribution of the email, and then it surged on the day when the follow-up email was sent. The response rate was highest in the day of the first distribution, and the follow-up email also was very effective.

The following sections describe population demographics, levels of reliability of scales, and results testing the hypotheses.

Demographics of the Subjects

Demographics showed that there were large numbers of whites and well educated subjects in the data. The ethnicities were composed of 84.8% whites, 4.6% Asian American, 3.6% African American, 1% Hispanics, and 6.6% multi-racial and international subjects. There were 38.6% males and 61.2% females. The ages of the respondents ranged from 21 to 72. Although the age of the original sample was limited to 27 or over, 3 participants were under age 27. The median age was 38, and the mean was 39.88. The proportions of income levels of subjects were not much different from each other: 19.2% of the sample classified themselves into income levels of less than $25,000, and $25,000 - $49,999, 24% in the level of $50,000 - $74,999, 15.3% in the level of $75,000 - $99,000, and 22.3% in the level of $ 100,000 or more. The status of the subjects consisted of 122 (39.5%) graduate students, 93 (30.1%) faculty, 90 (29.1%) staff, and 2 (.60 %) of undergraduate students. All of the participants were University community members, so education levels were very high. 94.4% of the subjects were college graduates or higher levels. Seventy six (25.2%) held doctoral degrees, 75 (24.8%) were doctoral students, 49 (16.2%) were college graduates, 43 (14.2%) were master's students, 42 (13.9%) held master's degrees, 11 (3.6%) were high school graduates, and 6 (2%) were undergraduate college students. Regarding household size, 63 (20.5%)

respondents lived alone, 116 (37.8%) lived with one person, 56 (18.2%) respondents lived with two, 59 (19.2%) respondents lived with three, and 13 (4.2%) respondents lived with four or more persons. Regarding marital status and children in households, 213 (69.4%) respondents were married, and 94 (30.6%) respondents were unmarried. Fifty five (18.3%) respondents had children under age 6, and 246 (81.7%) respondents had no children under age 6 in their households.

Results of DecisionalBalance (Pros and Cons)

Decisional Balance (Pros and Cons) Scores

The decisional balance consisted of nine variables of health consciousness, environment consciousness, hedonistics, convenience, trust in conventional food regulators, trust in organic food regulators, attitude toward conventional food, willingness to pay more for organic food, and price consciousness. The decisional balance scores can range from 9 to 45 because the number of questions was 9, and the 5 point Likert scale was used. The scores, in the main survey, ranged from minimum 12.77 to maximum 36.92, and the mean was 27.20. Table 22 shows the results.

Table 22

The Descriptive Analysis of Decisional Balance Score

	N	Range	Minimum	Maximum	Mean
Decisional Balance Score	330	24.15	12.77	36.92	27.2006

Reliability of the Scales of Decisional Balance Components.

Each pro and con was measured by multiple questions, so internal consistency reliability of the measures was checked. A few questions that lowered the levels of reliability of the measures were deleted in the data. Table 23 shows the results.

Table 23

Internal Consistency Reliability of Decisional Balance Components

Component	Cronbach's alpha coefficient	Component	Cronbach's alpha coefficient
Health consciousness	.858	Convenience	.823
Environment consciousness	.812	Trust in the regulators of conventional food	.854
Hedonistics	.816	Price consciousness	.824
Willingness to pay more for organic food	.684	Attitude toward conventional food	.844
Trust in the regulators of organic food	.803		

The results showed that the measures had high reliability which is higher than .80 except the variable of willingness to pay more for organic food.

Results of Self-efficacy

The reliability of the measures of self-efficacy was .852.

Results of Knowledge

The reliability of the measures of knowledge was very low of -.384 although a few questions were added after the second pilot test to enhance the reliability. The variable of knowledge was deleted in the analysis.

Media Use

Table 24 shows the results of media use. The Internet was the medium that the respondents used the longest time, and the magazine was used the shortest. Respondents used the Internet an average of 3.05 hours, watched TV 1.61 hours, listened to radio 1.51 hours, read newspapers .48 hours, and read magazines .39 hours a day. The range shows that there are big differences in the length of using each medium among the respondents.

Table 24

Media Use

	TV	Radio	Newspaper	Internet	Magazine
Mean (hour)	1.61	1.51	.48	3.05	.39
Median (hour)	1.50	1.00	.50	2.50	.25
Range (hour)	8	15	10	15	9

Results of Stages of Change

Reliability of Measures of Stages of Change

The levels of reliability of the measures of stages of change were high: Cronbach's alpha of .797 in precontemplation, .861 in contemplation, .779 in decision, .914 in action, and .972 in maintenance. A few questions that lowered reliability of the measures were deleted to find out the most reliable measures for each stage. Table 17 shows what items were deleted in the final analysis.

Distribution of Stages of Change

One hundred and forty six (46.1%) out of 317 respondents were classified to the precontemplation stage, 100 respondents (31.5%) to the maintenance stage, and 45 respondents (14.2%) to the contemplation stage. The numbers of respondents in the other stages of decision and action were very small: 17 (5.4%) in the decision stage, and 9 (2.8%) in the action stage.

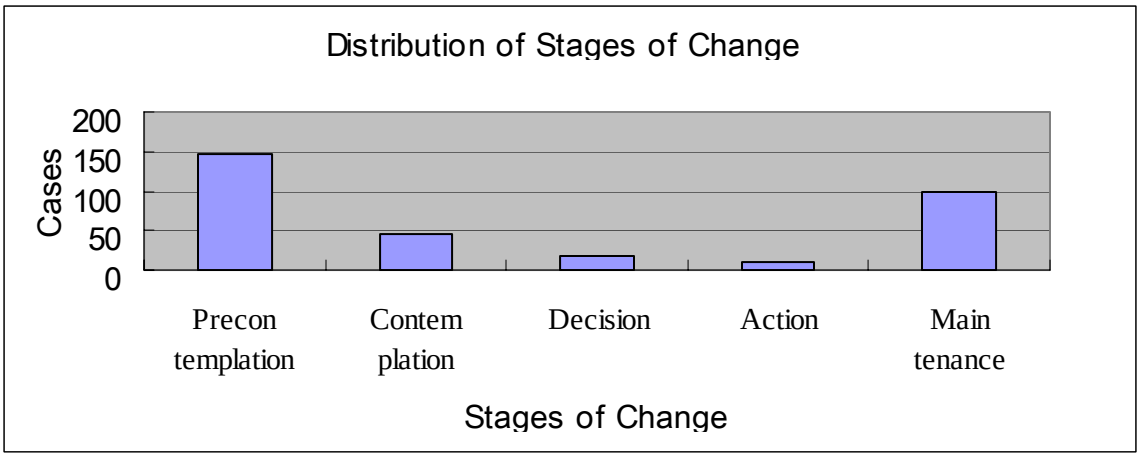

Figure 3. Distribution of Stages of Change in the Main Survey

Levels of Organic Food Consumption

The levels of organic food consumption were measured by the frequency of eating organic food and the proportion of money devoted to organic food out of the whole food budget. Two hundred and eighty nine (90.0%) respondents out of 321 had experience eating organic food and 32 (10.0%) respondents had no experience eating organic food. For the frequency of eating organic food, almost half of the respondents ate organic food once a month or less. One hundred and twenty eight (41.6%) respondents out of 308 ate organic food less than once a month, and 15 (4.9%) respondents ate once a month. The number of respondents who ate organic food once a day or more was 27 (8.8%), 4-6 times a week 26 (8.4%), 2-3 times a week was 47 (15.3%), once a week was 35 (10.6%), and once a couple of weeks was 30 (9.7%).

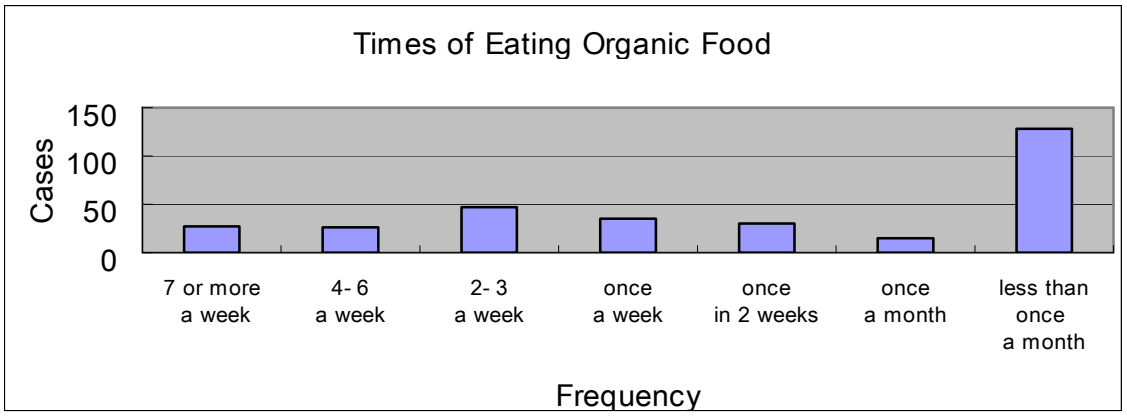

Figure 4. Distribution of Times of Eating Organic Food

Regarding the percentage of food money devoted to organic food, almost half of the respondents spent below 1% of food money on organic food. One hundred and forty three (47.2%) respondents out of 303 spent below 1% of food money for organic food, 40 (13.2%) spent 1 – 2.99%, 31 (10.2%) spent 3 – 4.99%, 31 (10.2%) spent 5 – 9.99%, 24 (7.9%) spent 10 – 19.99%, 20 (6.6%) spent 20 – 29.99%, and 14 (4.6%) spent 30% or more for organic food.

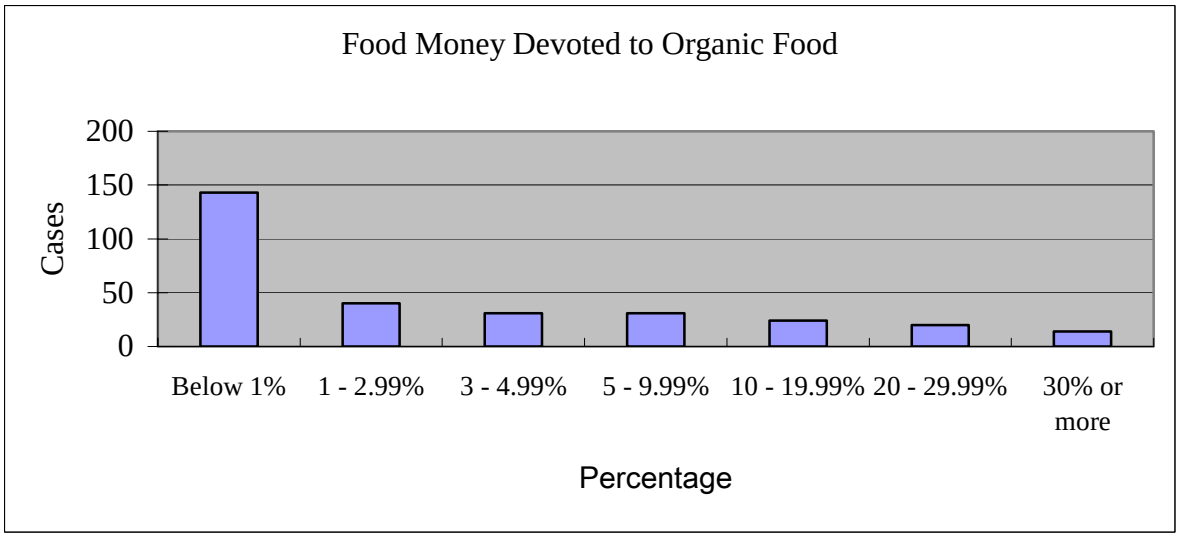

Figure 5. Distribution of Food Money Devoted to Organic Food

The products of organic food consumed were also investigated. Produce was the most popular organic food. One hundred and ninety four respondents (74.9%) ate organic produce. For the other organic foods, 94 (36.3%) respondents ate organic dairy food, 58 (22.4%) respondents ate organic snacks, 57 (22.0%) respondents ate organic meat or poultry, 56 (21.6%) respondents drink non-dairy beverage (soy), 43 (16.6%) respondents ate frozen organic food, 43 (16.6%) respondents ate organic bread, 41 (15.8%) respondents drank organic juice, and 27 (10.4%) respondents ate canned organic food.

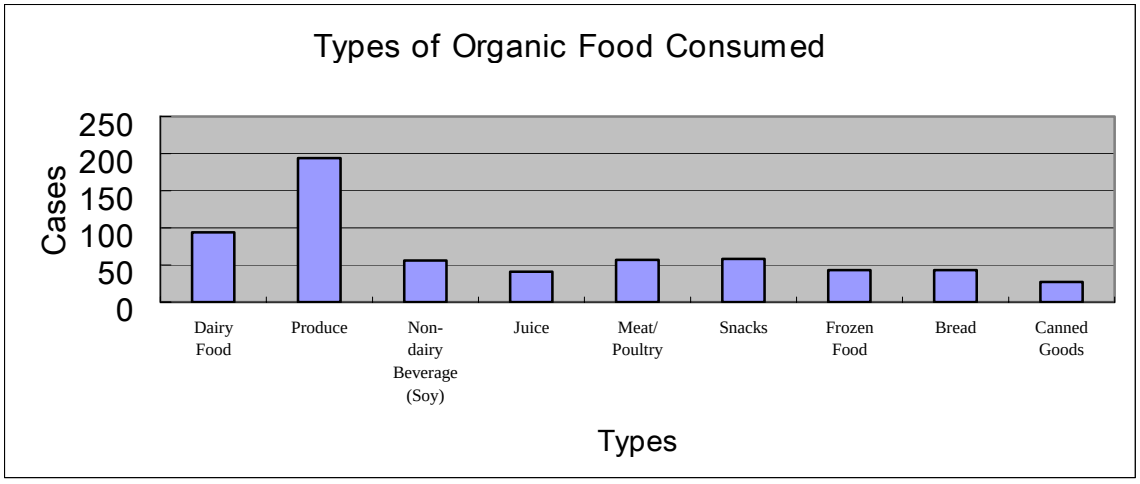

Figure 6. Distribution of Types of Organic Food Consumed

Tests of Hypotheses

The statistical significance level (alpha) of .05 was used to test the hypotheses.

Hypothesis 1

Hypothesis 1 predicted that there are positive correlations between stages of change and frequency of eating organic food, stages of change and percentage of food money devoted to organic food, and stages of change and self-efficacy.

The decisional balance score represents the total score of pros and cons of each respondent. It was calculated by summing up the scores of pros including health consciousness, environment consciousness, hedonistics, trust in organic food regulators, and willingness to pay more for organic food, and cons including convenience, trust in conventional food regulators, attitude toward conventional food, and price consciousness. Some of pros and cons scores were recoded to make strong cons have low scores. High scores represent high pros and low cons, and low scores represent low pros and high cons. Spearman correlation analysis was used to test this construct of the TTM. The correlations between the stages of change and organic food consumption measured by times of eating organic food and percentage of the food money devoted to organic food, decisional balance score, and self-efficacy were tested. Table 25 shows the correlations between the variables.

Table 25

Spearman Correlation Analysis for Hypothesis 1

	Decisional Balance Score	Self-Efficacy	Times of Eating Organic Food	Percent of Organic Food Money
Stages of Change	.640 (p<.05)	.665 (p<.05)	.508 (p<.05)	.755 (p<.05)

The results showed that there were significant positive correlations ($p<0.05$) between the stages of change and both measures of consumption level, the decisional balance score, and the self-efficacy. The correlation coefficients ranged from .508 to .738 with p – values less than .05. The correlation between the stages of change and times of eating organic food was .508 with p – value less than .05, and the correlation between the stages of change and food money devoted to organic food was .738 with p – value less than .05. The correlation between the stages of change and decisional balance score was .640 with p – value less than .05. The correlation between the stages of change and self-efficacy was .665 with p – value less than .05. All of the correlations were high and positive. All of the null hypotheses of the hypothesis 1 (1 - 1, 1 - 2, and 1 – 3) were rejected, and there were positive correlations between the stages of change and both measures of consumption level, the decisional balance, and the self-efficacy as other studies using the TTM showed.

Hypothesis 2

Hypothesis 2 examines whether there are differences in decisional balance score, its components, and self-efficacy among the stages of change. If there were differences among the stages, it was also investigated what stages were different from each other.

One-way ANOVA was used to test hypothesis 2. Table 26 shows the results of one-way ANOVA.

Table 26

ANOVA for Decisional Balance Score, the Components of the Decisional Balance, and Self-efficacy

		Df between	Df within	F	P - value
Decisional Balance	Decisional Balance Score	4	312	53.665	p<.05
	Health Conscousness	4	312	30.356	p<.05
	Environment consciousness	4	312	22.932	p<.05
	Hedonistics	4	312	34.624	p<.05
	Trust in organic food regulators	4	312	8.312	p<.05
	Willingness to pay more for organic food	4	312	28.756	p<.05
	Convenience	4	312	8.048	p<.05
	Trust in conventional food regulators	4	312	17.764	p<.05
	Attitude toward conventional food	4	312	63.765	p<.05
	Price consciousness	4	312	1.541	.190

Self-efficacy	4	312	60.026	p<.05

There were statistically significant differences in decisional balance scores among the stages of change ($p < .05$). In testing specific variables of the components of the decisional balance, there were statistically significant differences in all variables ($p < .05$) among the stages of change at 95% of significance level except price consciousness variable ($p = .190$). There also was a significant difference in self-efficacy among stages of change ($p < .05$). Post hoc ANOVA using Bonfferoni method was employed to examine what stages were different from the other stages. Table 27 shows the results.

Table 27

Results of Post Hoc ANOVA

Variable	Compared stages	p – value
Decisional balance score	Precontemplation * Contemplation	p < .05
	Precontemplation * Decision	p < .05
	Precontemplation * Action	p < .05
	Precontemplation * Maintenance	p < .05
Health consciousness	Precontemplation * Contemplation	p < .05
	Precontemplation * Decision	p < .05
	Precontemplation * Action	p < .05
	Precontemplation * Maintenance	p < .05
Environment consciousness	Precontemplation * Contemplation	p < .05
	Precontemplation * Decision	p < .05
	Precontemplation * Action	p < .05
	Precontemplation * Maintenance	p < .05

Hedonistics	Precontemplation * Contemplation	p < .05
	Precontemplation * Decision	p < .05
	Precontemplation * Action	p < .05
	Precontemplation * Maintenance	p < .05
Trust in the	Precontemplation * Contemplation	p < .05
regulators of organic	Precontemplation * Decision	p < .05
food	Precontemplation * Maintenance	p < .05
Willingness to pay	Precontemplation * Contemplation	p < .05
more	Precontemplation * Decision	p < .05
	Precontemplation * Action	p < .05
	Precontemplation * Maintenance	p < .05
	Contemplation * Maintenance	p < .05
Attitude toward	Precontemplation * Contemplation	p < .05
conventional food	Precontemplation * Decision	p < .05
	Precontemplation * Action	p < .05
	Precontemplation * Maintenance	p < .05
	Contemplation * Maintenance	p < .05
Convenience	Precontemplation * Maintenance	p < .05
	Contemplation * Maintenance	p < .05
	Decision * Maintenance	p < .05
Trust in the	Precontemplation * Contemplation	p < .05
regulators of	Precontemplation * Decision	p < .05
conventional food	Precontemplation * Action	p < .05
	Precontemplation * Maintenance	p < .05
Price consciousness	No differences among stages	p > .05
Self-efficacy	Precontemplation * Decision	p < .05
	Precontemplation * Action	p < .05
	Precontemplation * Maintenance	p < .05
	Contemplation * Decision	p < .05
	Contemplation * Action	p < .05
	Contemplation * Maintenance	p < .05

For many variables, only the precontemplation stage is different from the other stages. In the decisional balance score, the precontemplation stage was smaller than those

of the other four stages of contemplation, decision, action, and maintenance, and there were no statistically significant differences in the consumers' perceived pros and cons of organic food among the other four stages. In health consciousness, environment consciousness, hedonistics, and trust in the regulators of conventional food, only the precontemplation stage was different from the other four stages of change. In trust in the regulators of organic food, the precontemplation stage was different from the contemplation, decision, and maintenance stages. In willingness to pay more for organic food, and attitude toward conventional food, the precontemplation stage was different from the decision, action, and maintenance stages, and the contemplation stage was different from the maintenance stage. In convenience, maintenance was different from three stages of precontemplation, contemplation, and decision.

In self-efficacy, each of precontemplation and contemplation stage was different from the other three stages of decision, action, and maintenance. Self-efficacy showed difference between non organic food consumers (precontemplation and contemplation) and actual organic food consumers (decision, action, and maintenance).

Hypothesis 3

Hypothesis 3 examines whether there are differences in demographics among the stages of change. Demographics were analyzed with Chi-square analysis and ANOVA.

The variables of gender, marital status, education level, and children in households or not were analyzed with Pearson chi-square analysis (hypothesis 3 – 1). The variables of age, income, household size, and the number of children in households under 6 were analyzed with one-way ANOVA (hypothesis 3 – 2).

Table 28 shows the results of Pearson Chi-square analyses with gender, marital status, education level, and presence of children under 6 in households.

Table 28

Chi-square Analyses of Gender, Marital Status, Education, and Children in Households.

	DF	N	X2	P
Gender	4	295	2.003	NS
Marital status	4	294	3.633	NS
Education	12	289	9.436	NS
Children under 6 in households or not	4	284	4.379	NS

The Pearson Chi-square tests indicated that the relationships between stage and gender, marital status, education, and children in households or not were not statistically significant ($p > .05$). Chi-square analysis requires that every cell analyzed have more than 5 subjects. In this study of stages of change, the number of stages was 5, and the other variables examined with stages have 2 or more categories. The numbers of cells in the chi-square analyses ranged 10 to 20 (5 stages by 2 gender, 5 stages by 4 education level), and there were a few cells that had less than 5 subjects. Therefore, there could be

differences in the results of Chi-square analyses if the number of samples was increased to include more participants in the decision and action stages.

The variables of age, income, household size, and the number of children under 6 in households were analyzed with one-way ANOVA (hypothesis 3 – 2). Table 29 showed the results of the one-way ANOVA.

Table 29

ANOVA with Demographics

	Df between	Df within	F	P - value
Age	4	275	.264	NS
Income	4	270	2.151	NS
Household size	4	289	.955	NS
Number of children under 6	4	284	1.004	NS

ANOVA tests indicated that there were no statistically significant differences in age, income, household size, number of children under 6 among the stages of change.

Hypothesis 4

Hypothesis 4 examines what variables discriminate among the stages of change. The discriminant analysis was performed with stage as the dependent variable. The following predictor variables were selected because each was statistically different for the stages of change: self-efficacy, and the components of decisional balance including health consciousness, environment consciousness, hedonistics, convenience, trust in

conventional food regulators, trust in organic food regulators, attitude toward conventional food, willingness to pay more for organic food. A total of 310 cases were analyzed.

The stepwise variable selection procedures that measure the importance of each variable in terms of group separation were conducted. Table 30 shows the order of entering each of the variables. At each step, the variable that minimizes the overall Wilks' Lamda was entered. Wilks' Lamda ranges from 0 to 1. Lower values indicate larger mean differences, and indicates stronger group separation (Silva & Stam, 1995).

Table 30

Variables Entered in the StepwiseDiscriminant Analysis

Step	Variables entered	Tolerance	F to Remove	Wilks' Lambda
1	Attitude toward conventional food	1.000	61.262	
2	Attitude toward conventional food	.965	28.174	.560
	Self-efficacy	.965	27.238	.554
3	Attitude toward conventional food	.917	17.590	.462
	Self-efficacy	.963	25.012	.498
	Health consciousness	.942	6.809	.408
4	Attitude toward conventional food	.917	16.430	.433
	Self-efficacy	.933	18.358	.442
	Health consciousness	.919	5.389	.381
	Willingness to pay more for organic food	.937	3.999	.375

Out of nine variables entered with the analysis, four variables were selected and entered in the stepwise discriminant analysis. The variable of attitude toward

conventional food was entered first. Self-efficacy followed it, and lowered Wilks' Lamda value to .554. Then, health consciousness, and willingness to pay more for organic food were entered in the next step, and lowered the Wilks' Lamda value to .375. All the variables entered in the stepwise discriminant analysis are used in each discriminant function. There were four discriminant functions, but not every function was statistically significant, and the importance of each discriminant function varies. Eigenvalues in Table 31 show how much each function explains between-group variance, and the p-value of Wilks' Lamda in Table 32 shows what functions were significant in separating the stages.

Table 31

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	1.550	93.9	93.9	.780
2	.088	5.3	99.2	.284
3	.013	.8	100.0	.115
4	.000	.0	100.0	.002

The importance of the functions in terms of group separation is reflected by their corresponding eigenvalues. The eigenvalue for a function, divided by the sum of all the eigenvalues, is a ratio that can be interpreted as the proportion of between-groups variation explained by the function (Silva & Stam, 1995). The larger the eigenvalue, the more important the function is for group separation (Silva & Stam, 1995). As seen in

Table 31 (eigenvalue), the eigenvalue associated with function 1 (1.550) is larger than that for function 2 (.088), which in turn is larger than the eigenvalue for function 3 (.013), and 4 (.000). In terms of between-groups separation, function 1 accounted for 1.550/(1.550 + .088 + .013 + .000) = 93.88, or 93.88%, of the between-groups variation. The function 2 explained 5.3%, and the function 3 did only .8% of the between-groups variation.

Table 32

Wilks' Lamda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.356	314.756	16	P < .05
2	.907	29.729	9	P < .05
3	.987	4.056	4	P > .05
4	1.000	.001	1	P > .05

The table 32 showed what functions were significant in separating stages. Function 1 and 2 were found to be significant, and the other functions were not used in the analysis.

There are two indicators that show what variables play important roles in each significant function: standardized canonical discriminant function coefficients and structure matrix. Standardized canonical discriminant function coefficients are used to compare the relative importance of the independent variables. These are partial

coefficients, only the unique explanation of each independent is being compared, not considering any shared explanation (Brace, Kemp, & Snelgar, 2003). Structure coefficients are the correlations between a given independent variable and the discriminant scores associated with a given discriminant function. Structure coefficients are used to tell how closely a variable is related to each function in multiple discriminant analysis (Brace, Kemp, & Snelgar, 2003). Standardized canonical discriminant function coefficients show the respective variable's unique contribution to the discrimination specified by the respective discriminant function whereas structure matrix is used to derive substantive "meaningful" labels for the discriminant functions. In this study, the goal is to find out what variables discriminate stages effectively, and standardized canonical discriminant function coefficients were considered important.

Table 33

Standardized Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
Health consciousness	.258	-.524	.863	.050
Willingness to pay more for organic food	.291	.135	-.256	.948
Attitude toward conventional food	-.529	.474	.705	.300
Self-efficacy	.517	.753	.300	-.384

Table34

Structure Matrix

Variable	Function			
	1	2	3	4
Attitude toward conventional food	-.711	.446	.466	.280
Self-efficacy	.696	.643	.197	-.252
Health consciousness	.481	-.543	.679	.113
Willingness to pay more for organic food	.481	.149	-.104	.858

As seen from the standardized discriminant coefficients in Table 33, as well as from the correlations in structure matrix in Table 34, the variables of the attitude toward conventional food (-.539), and self-efficacy (.517) made the greatest contribution to the discrimination, and also were most related to the function 1 (-.711, and .696 each). The variables of health consciousness, and willingness to pay more for organic food made a small contribution to the discrimination (.258, and .291 each), and were less related to the function 1 (both of .481). For the function 2, the contributions of variables were slightly different: self-efficacy made .753, health consciousness -.524, attitude toward conventional food .474, and willingness to pay more for organic food .135. There was a difference in importance of the variables between function 1 and function 2, and the coefficients of the variables of health consciousness, and attitude toward conventional

food were opposite to those of function1. The weights (coefficients) and the directions of the coefficients of the variables in the function 1 have much higher priority in discrimination because function 1 explained most of the between-groups variation (93.9 %). It is concluded that the variables of attitude toward conventional food, and self-efficacy made the greatest contribution in discriminating the stages, and the other two variables of health consciousness and the willingness to pay more for organic food made relatively less contribution to discriminating the stages.

A plot of the data shows how the functions separated the stages. Function 1 and the function 2 were the only plotted functions because most of the group differences were explained by these first two functions (99.2%), and these were the only significant functions in the analysis.

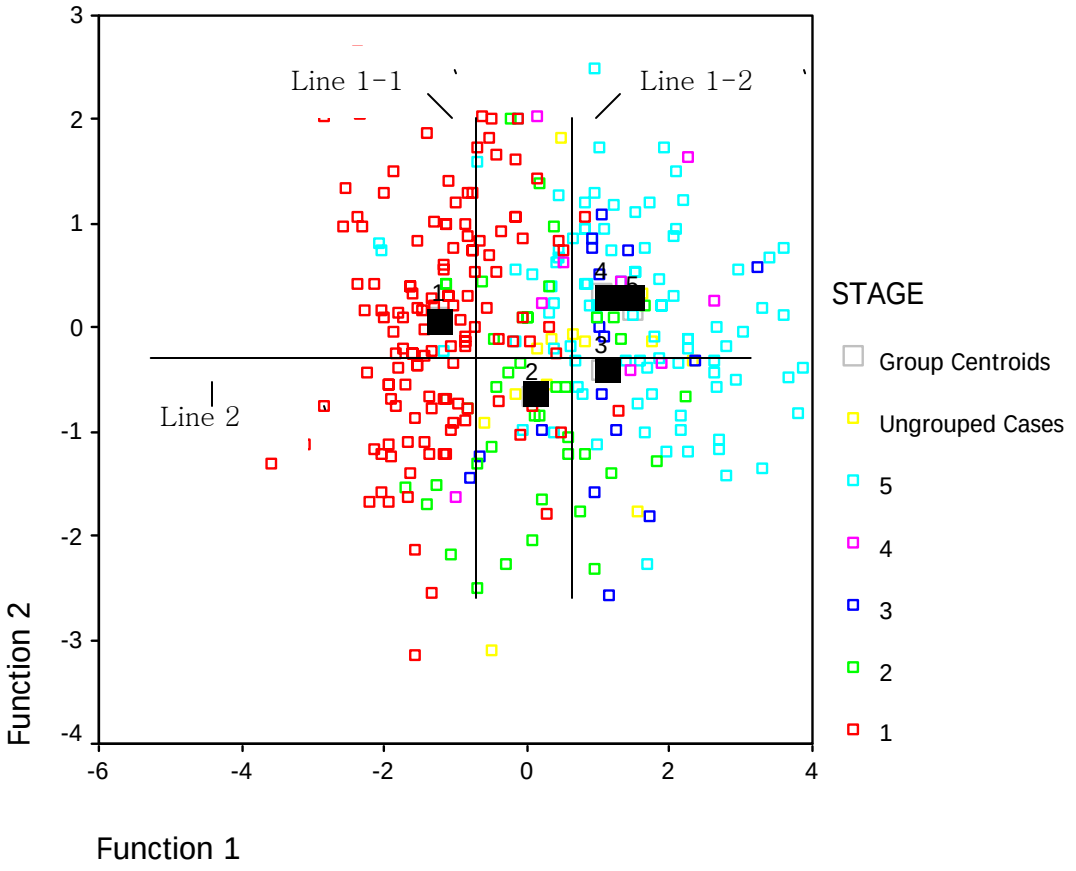

Figure 7. Scatter Plot in the Discriminant Analysis

Function 1 separates stage 1 (precontemplation) from stage 2 (contemplation) as line 1-1 indicates, and also separates these two stages from the stage 3 (decision), 4 (action), and 5 (maintenance) as line 1-2 indicates. The stages 3, 4, and 5 are very close to each other for function 1, and could not be separated from each other. Fuction 2 played a role in separating stages 2 and 3 from stages 1, 4, and 5 as line 2 indicates. By using function 2, the stages of 4 and 5 can be separated from the stage 3, but neither function

separates stage 4 and 5. The results of the classification show how well the functions discriminated the stages.

Table 35

Classification Results

		Predicted Group Membership					
	STAGE	Precontemplation	Contemplation	Decision	Action	Maintenance	Total
Original group membership	Precontemplation	132 (92.3%)	4 (2.8%)	0 (.0%)	0 (.0%)	7 (4.9%)	143
	Contemplation	20 (47.6%)	10 (23.8%)	1 (2.4%)	0 (.0%)	11 (26.2%)	42
	Decision	2 (11.8%)	2 (11.8%)	0 (.0%)	0 (.0%)	13 (76.5%)	17
	Action	3 (33.3%)	0 (.0%)	0 (.0%)	0 (.0%)	6 (66.7%)	9
	Maintenance	8 (8.1%)	2 (2.0%)	0 (.0%)	0 (.0%)	89 (89.9%)	99
	Ungrouped cases	3 (23.1%)	2 (15.4%)	0 (.0%)	0 (.0%)	8 (61.5%)	13

a. 74.5% of original grouped cases correctly classified.

The table shows the nature of the predictions and gives an indication of how well the functions predicted group membership (stages). Overall the discriminant function successfully predicted outcome for 74.5% of cases. However, the result is not as good as it seems. The functions accurately predicted 92.3 % of the consumers in the precontemplation stage, 23.8 % in the contemplation stage, 0 % in the decision stage, and

the action stage, and 89.9 % in the maintenance stage. It was very effective in predicting precontemplation and maintenance, but not effective in predicting contemplation, decision, and action stages.

Media Use

It is important to know what media are most preferred by consumers to set up effective media strategies. Consumers' media uses for their information seeking on general food and organic food were investigated. In information seeking about food, the Internet dominated the other media such as books, brochures, magazines, TV, and so on. Eighty three percent of respondents had experience in seeking information about food, and 57.3 % of the respondents found that the Internet was the most useful information source, and 88.9% of the respondents looked first at search engines on the web. Books (16.9%) were the second, and brochures and pamphlets (6.0%) were the third preferred medium for food information seeking. The proportion of the respondents who had experience in seeking information about organic food was 46.5%. The Internet (44.2%) was the most used medum, books (14.9%) were the second, and magazines (10.4%) were the third. Magazines (10.4%) were more important in organic food information seeking than in general food information seeking (3.6%). It might be interpreted that information about organic food is more specialized than that of general food, and consumers expect

more expertise. Magazines are known to have higher levels of expertise than other media (Sissors and Baron, 2002). Even though the Internet was the preferred medium, it is not an effective way to do advertising for precontemplators because the Internet demands proactive information seeking. TV and Radio may be more helpful for advertising practitioners.

CHAPTER 5: DISCUSSION AND CONCLUSION

The Transtheoretical model has been used to analyze a wide range of behaviors, such as smoking cessation, weight loss, vegetable and fruit intake, condom use, and so on. This study examined the applicability of the TTM for an organic diet. Measures were developed and adapted from prior studies of the TTM and organic food consumption, and their internal consistency was tested. The measures with adequate reliability were selected to be used for data analysis.

Hypothesis 1 examined whether the TTM was appropriate to describe behavior change in organic food consumption. Stage of change was correlated with decisional balance, self-efficacy, actual amount of consumption measured by times of eating organic food, and percentage of the food money devoted to organic food. The correlations were positive and statistically significant as other studies using the TTM showed. As people perceived more pros, and have more self-efficacy, they were more likely to be in the higher levels of stages of change. Also, the people who are in higher levels of the stages of change were more likely to eat organic food more frequently and to spend more money for organic food than the people in the lower levels of the stages of change.

Hypothesis 2 examined whether there are differences in decisional balance scores, its components, and self-efficacy among the stages of change. ANOVA showed that there

were differences among the stages in most variables: decisional balance score, health consciousness, environment consciousness, hedonistics, trust in organic food regulators, trust in conventional food regulators, willingness to pay more for organic food, attitude toward conventional food, and self-efficacy.

Assuming that behavior change occurs step by step, the results of post hoc analysis are important because the differences between the two adjacent stages imply how practitioners might move people in one stage to the next stage.

There were differences between the precontemplation stage and the contemplation stage in all variables that showed significant differences in ANOVA: decisional balance score, health consciousness, environment consciousness, hedonistics, trust in organic food regulators, trust in conventional food regulators, willingness to pay more for organic food, attitude toward conventional food, and self-efficacy. This means that if practitioners want to move people in precontemplation stage to contemplation stage, they have to consider improving all of consumers' perceptions of organic food and their self-efficacy. This change from the precontemplation to contemplation stages requires more effort and cost than any changes in the other stages because of the number of variables that showed differences between those two stages.

Between the contemplation and decision stages, a difference was shown in only

one variable, self-efficacy. Between the decision and action stages, there was no variable that showed a difference. Only one variable, convenience, showed a difference between the decision and maintenance stages. Between the action and maintenances stages, there was no variable showing a difference.

Compared with differences between precontemplation and contemplation, it will cost much less in terms of advertising to move people in the contemplation stage to the decision stage, and people in the decision stage to the maintenance stage. The advertising message can be focused on self-efficacy for the people in the contemplation stage, and on convenience for the people in the decision stage. Increased self-efficacy leads people who are just thinking of eating organic food to action to try organic food. The convenience variable showed a difference between people who are consistently working on organic diets (maintenance) and people in the other stages who are not interested in (precontemplation), thinking of (contemplation), or just starting (decision) to eat organic food. It is necessary to make consumers feel that it is convenient to buy organic food to move them to the more stable stage (maintenance) where they are eating organic foods. Self-efficacy and convenience variables are important because they make non-consumers of organic food, who are just thinking of an organic diet, actually try and then maintain their organic diets.

Between the action and maintenance stages, no difference was shown in any variable. In actual consumption level of organic food, measured by times of eating organic food and food money devoted to organic food, there were no differences between the two stages according to the results of the ANOVA post hoc analysis. For both eating organic food and food money devoted to organic food, the action stage was different from both the precontemplation and contemplation stages, and the maintenance stage was different from the precontemplation, the contemplation, and the decision stages. There was no difference in the actual consumption level as well as in all other variables between the action stage and the maintenance stage. These results suggest that these two stages may not be different from each other in terms of consumers' perceptions and behaviors. Thus, the two stages may be merged in future studies.

Hypothesis 3 investigated whether there are differences in demographic variables among the stages. The results of ANOVA and Chi-square analysis showed that there was not a significant difference for any of these demographic variables across the stages of change in organic food consumption. Therefore, it does not seem effective to use demographic data to explain consumers' dietary behavior with organic food.

Hypothesis 4 examined what variables discriminated among consumers' stages of change. The stepwise discriminant analysis was employed to determine which

variables had utility in predicting the stage of change for eating organic food. It was found that the variables of attitude toward conventional food, self-efficacy, health consciousness, and willingness to pay more for organic food were significant in the discriminant anaysis, and they were the best predictors differentiating consumers across the stages. Among them, the first two variables were the most powerful in differentiating the stages.

As a whole, the variables that show the largest standardized canonical coefficients and most related to the discriminant functions are the most powerful variables to enhance consumers' behavior change. However, this analysis is not about change from one stage to the next one, but shows what variables effectively divide people into different stages of change. It means that the variables are effective in discriminating stages as a whole. Even though some variables are shown to be highly related to the discriminant function, it does not mean that they are highly effective in discriminating people in **every** stage. The function drawn by the discriminant analysis correctly classified 74.5% of the respondents. However, the function was not good enough to be applied to every stage. It was good for only stable stages: the precontemplation stage (92.3%) and the maintenance stage (89.9%). It was of no use to apply the functions to the other stages. The functions correctly classified 23.8% for the contemplation stage and 0%

for both of the decision stage and the action stage. Thus, the results of the discriminant analysis are only useful for moving people in the following ways: the precontemplation stage to another stage; other stages to the maintenance stage; and for keeping people in the maintenance stage. The results of the post hoc ANOVA are more useful in understanding the contemplation, decision, and action stages.

Combining all the analyses in this study, we can summarize what variables are important to move consumers from one stage to the next. For the consumers in the precontemplation stage, self-efficacy, health consciousness, environment consciousness, hedonistics, attitude toward conventional food, trust in the regulators of organic food and conventional food, convenience, and willingness to pay more for organic food should be enhanced to move people in the precontemplation stage to another stage. It may be more efficient to focus advertising on the variables, which the discriminant analysis showed to be the best predictors. The variables should be prioritized in the following way: first, attitude toward conventional food and self-efficacy; next, the variables of health consciousness and willingness to pay more for organic food; followed by the rest of the variables that showed statistical significance in ANOVA: environment consciousness, hedonistics, trust in the regulators of organic food, trust in the regulators of conventional food, and convenience. From the results, it is recommended that the advertising messages

focus on attacking vulnerability of conventional food (attitude toward conventional food) and on making consumers believe in their capabilities to include more organic food in their diet. Then the advertising can present the advantages of organic food (health consciousness) and explain why organic farming costs more than conventional farming does (willingness to pay more for organic food). In addition, advertising needs to remind consumers of benefits of organic farming to environments, to enhance their trust in the regulators of organic food, convenience, and hedonistics, and to diminish their trust in the regulators of conventional food (variables significant in ANOVA).

For the people in the contemplation stage and the decision stage, advertising messages are simple. According to the results of post hoc ANOVA, self-efficacy can enhance the level of the readiness of people in the contemplation stage to consume organic food. The advertising message needs to enhance consumers' self-efficacy in purchasing organic food. For example, messages that describe how easy it is to shop and keep a variety of organic food at hand would enhance self-efficacy. For people in the decision stage, convenience should be emphasized in the advertising message. Convenience was measured by time and effort to get to the places that sell organic food. Organic food companies need to expand their distribution channels to cover more retail stores, and advertise the increased number of well-known stores that carry organic food,

and remind consumers that organic food is more available than they think. It may be helpful to enhance consumers' perception of convenience to help them maintain shopping for organic food.

In addition, ANOVA identified other variables that could be enhanced to make consumers in the unstable stages (contemplation and decision) go to the maintenance stage, and to keep the consumers already in the maintenance stage. ANOVA showed differences between the contemplation stage and the maintenance stage in the following four variables: attitude toward conventional food, self-efficacy, health consciousness, and willingness to pay more for organic food. These four variables should be enhanced in order to move consumers from the contemplation stage to the maintenance stage.

Limitation

This study assumed that there were five stages of change, which have been found in most studies, but the results showed that there may not be five stages of organic food consumption. The numbers of the respondents classified within the decision and action stages were very small, and few differences were found between them and their adjacent stages. The small numbers of respondents in both stages lowered the power of the statistical test. Thirty nine respondents for each stage were required to have power of .80, but there were only 17 respondents in decision stage, and 9 in action stage. In addition,

the proportions of respondents in decision stage (5.4%) and action stage (2.8%) were too small to warrant tailoring mass media advertising strategies to them. Targeting a tiny proportion of audience will diminish the efficiency of the advertising. To achieve efficient as well as effective strategies for mass media advertising, it is necessary to merge stages so that the decision stage is added to the contemplation stage and the action stage is added to the maintenance stage.

The new model using the TTM for organic food consumption, based on this study, should be composed of three stages: precontemplation, contemplation and trial (contemplation and decision), and consumption (action and maintenance). The precontemplation stage includes the people who are not interested in organic food. The contemplation and trial stage includes the people who are thinking of eating organic food, and sometimes try to eat organic food. The consumption stage represents the people who eat organic food on a regular basis, and spend more than people in the other stages do. It is necessary to establish criteria for frequency of eating organic food and food proportion of budget devoted to organic food to differentiate the consumption stage from the contemplation and trial stage. The criteria may be set according to average consumption level of organic food consumers, or be set by organic food companies that have their own goals of consumption level by each organic food consumer.

Another limitation of this study results from the nature of this sample. All the respondents were university community members who generally had higher levels of education. Even though this study failed to show differences in education among the stages, this result needs replication with a general population. The result could be different when more respondents with less education are included. Regarding media use, these results showed that the Internet is the most preferred medium, but the respondents were university community members who are highly internet-friendly, and can easily access the Internet all around the campus. Thus, media use may be different for general consumers.

In addition, there are issues related to the measures used. Because the knowledge variable showed low reliability, it was not used in the analyses. In the future, the measures should be developed to make the knowledge variable usable in analyses. It would be more appropriate to use a true/false scale rather than a 5 point Likert scale. For the convenience variable, “product” rather than “store” is more a appropriate language choice because we want to focus on availability of actual food items rather than their distribution outlets.

Anther limitation involves the chi-square analysis. Chi-square analyses should have a minimum of 5 subjects per cell. That minimum was not met in every cell in this

study. It may be helpful to analyze these data with only three stages, precontemplation, contemplation, and maintenance, assuring adequate number of subjects in each cell.

The response rate was only 16.55%. No analysis of non-respondent was conducted. It would be useful to attempt to discover if the non-respondents were different from respondents.

In future studies, involvement with food and nutrition might be an interesting variable to include.

The samples of the university community members are highly educated and fairly homogeneous, which makes them different from general consumers. However, this study did not focus on the facts of organic food consumption such as how many people buy organic food, how much money they spend on it, and what kind of organic food they consume. Rather, it focused on behavior change, that is, how consumers change, and what variables are important in each level of organic food consumption. The results of this study should be generalizable in spite of this sampling limitation, but replications are needed because there were few studies available that used the TTM for the organic food consumption.

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Appendix A. Survey Questionnaires

Stages of change

Stage	Stage Scale Items	Score
Precontemplation	- As far as I'm concerned, I don't have any problem with eating only conventional food. - I don't eat organic food and right now I don't care. - I would rather live with eating too little organic food than to try to eat more. - I could eat organic food regularly, but I don't plan to. - I may not eat enough organic food, but why spend time thinking about it?	1 2 3 4 5
Contemplation	- I eat too little organic food, and really think I should eat some. - I wish I had more ideas on how to eat more organic food. - I have been thinking that I might want to start eating organic food. - I have been thinking about whether I will be able to eat organic food. - I hope that someone will have some good advice for me to eat organic food. - I really think I should work on getting started (more) organic food in the next 6 months.	1 2 3 4 5
Decision	- I have started eating more organic food, but I'd like some help to get organic food. - Eating organic food seems difficult, but I am going to try in the next month. - I am going to start eating (more) organic food in the next 30 days.	1 2 3 4 5

Action	- I am finally eating organic food. - I have started eating organic food within last 6 months. - Anyone can talk about eating more organic food; I'm actually doing it. - I have started to eat organic food regularly, and I plan to continue. - I am actively working at eating organic food.	1 2 3 4 5
Maintenance	- I have been successful at including organic food in my diet and I plan to continue. - I've been eating organic food regularly for over 6 months and want to continue. - I have managed to continue eating organic food through the last 6 months. - I have completed 6 months of including organic food in my diet. - After 6 months, I still keep working to eat organic food regularly.	1 2 3 4 5

Consumption level Questionnaires

Item	Questionnaire
Frequency	- How many times do you eat organic food? 1) seven times a week or more, 2) 4-6 times a week, 3) 2-3 times a week, 3) once a week, 4) once a couple of weeks, 5) once a month, 6) less than once a month
Percentage	- What percentage of food expenditure is devoted to organic food? Below 1%, 2) 1 – 2.99%, 3) 3 – 4.99%, 2) 5 – 9.99%, 3) 10 – 19.99%, 4) 20 – 29.99%, 5) 30% or more
Food category	- What kind of organic food do you eat? 1) dairy food 2)produce 3) non-dairy beverage (soy) 4) juice 5) meat/poultry 6) snacks 7) frozen food 8) bread 9) canned goods 10) others

Decisional Balance (Pros and Cons)

Category	Questionnaire	Score
Health Consciousness	- Organic food is very safe. - Organic food is very nutritious. - Organic food keeps me healthy. - All and all, it is good for my health to eat organic food.	1 2 3 4 5
Environment Consciousness	- By eating organic food I get a food that is environmentally friendly - Consuming organic food is helpful in protecting environment from contamination.	1 2 3 4 5
Hedonistics	- By eating organic food I get a food that has a better taste. - By eating organic food I get a food that has a better flavor. - By eating organic food I get a food that is fresh.	1 2 3 4 5
Trust in the regulator of conventional food	- The country has high standards for food safety. - The government food regulations reflect what's best for everyone. - The government sets and monitors food safety guidelines well.	1 2 3 4 5
Trust in the regulator of organic food	- I believe the regulators of organic food manage the quality of organic food appropriately. - The organic food industry is well regulated. - Organic farmers follow the standards of producing organic food. - I think organic farmers meet the criteria of organic food.	1 2 3 4 5
Willingness to pay more for organic food	- It is fair to pay more for organic food. - I am willing to pay more for organic food.	1 2 3 4 5
Price Consciousness	- I pay attention to price offers. - I am not willing to take extra efforts to find lower prices. - I will grocery shop at more than one store to take advantage of low prices. - The money saved by finding lower prices is usually not worth the time and effort. - I would never shop at more than one store to find low prices	1 2 3 4 5

Convenience	- It is difficult to find an organic food store. - It is not easy to get to an organic food store (distance).	1 2 3 4 5
Attitude toward conventional food	- It is safe to take conventional food. - I am satisfied with conventional food, and feel there are no problems with it.	1 2 3 4 5

Self-efficacy

Questionnaire	Score
- I can keep organic food at hand/readily available.	1 2 3 4 5
- I have time to shop for organic food.	1 2 3 4 5
- I can shop for a variety of organic food.	1 2 3 4 5
- If I spend more time at home, I can eat more of organic food.	1 2 3 4 5
- I am confident I will eat more organic food or will eat organic food regularly.	1 2 3 4 5

Media use

Category	Questionnaire	Unit
Length of using a medium	A-15. How many hours do you watch television? A-16. How many hours do you listen to the radio? A-17. How many hours do you read a newspaper? A-18. How many hours do you use Internet? A-19 How many hours do you read a magazine?	hour
Experience of looking information on food and organic food, and used media	A-20. Have you ever looked for information about food from any source? A-21. If yes, where did you look first? 1) books, 2) brochures, pamphlets, etc., 3) family, 4) friend/co-worker, 5) internet, 6) library, 7) magazines, 8) newspapers, 9) radio, 10) telephone information number (1-800 number), 11) television, 12) other ( ) A-22. If you used Internet, where did you look first on the Web? 1) search engine, 2) online magazine, 3) online newspaper, 4) online television, 5) online radio, 6) online community, 7) company homepage, 8) organic food related organization homepage, 9) other ( )	Yes ( ) No ( )

	A-23. If you have not search for information on food, where would you like to look first when you need it? 1) books, 2) brochures, pamphlets, etc., 3) family, 4) friend/co-worker, 5) internet, 6) library, 7) magazines, 8) newspapers, 9) radio, 10) telephone information number (1-800 number), 11) television, 12) other ( )	
	A-24. Have you ever looked for information about organic food from any source?	Yes ( ) No ( )
	A-25. If yes, where did you look first? 1) books, 2) brochures, pamphlets, etc., 3) family, 4) friend/co-worker, 5) internet, 6) library, 7) magazines, 8) newspapers, 9) radio, 10) telephone information number (1-800 number), 11) television, 12) other ( )	

Demographics

Item	Questionnaire
Gender	60. What is your gender? Male ( ) Female ( )
Age	61. What is your age? ( )
Marriage	Are you married? Yes ( ) No ( )
Education	63. What is your academic year or education level? 1) Below high school Graduate 2) Freshman, 3) Sophomore, 4) Junior, 5) Senior, 6) College Graduate, 7) Master's student, 8) Having Master's Degree, 9) Doctoral Student, 10) Having Doctoral Degree, 11) Student in Professional Program or Certificate Program
Household size	64. What is your household size? 1) One 2) two 3) three 4) four 5) more than five
Children under 6	How many children in your household are under age 6? 1) one 2) two 3) three 4) four 5) five or more
Ethnicity	65. What is your ethnicity? 1) White, 2) African American, 3) Hispanic, 4) Asian American, 5) others ( )
Income	66. What is your family income? 1) Less than $25,000, 2) $25,000-$49,999, 3) $50,000-$74,999 4) $75,000-$99,999, 4) $100,000 or more