CONSUMERS' WILLINGNESS TO PAY FOR ORGANIC AND LOCAL FOOD:

AN EXPERIMENTAL STUDY USING STRUCTURAL EQUATION MODELING

by

Xinwei Chen

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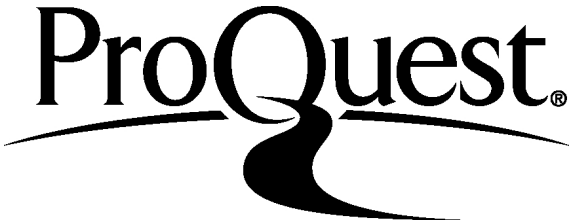

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ABSTRACT

Among the fastest growing food trends in the US is the consumption of organic and local food. This thesis studied the psychological determinants of willingness to pay (WTP) and purchase behavior for different types of organic and local food. Besides, the framework and hypotheses derived from the Theory of Planned Behavior (TPB) were tested by the empirical data collected from an auction experiment. Specifically, attitudes, norms and perceived behavior control were modeled to impact consumers' WTP and purchase behavior by using structural equation modeling (SEM).

The data used in this study was from an auction experiment conducted in the Experimental Economics Laboratory for Policy and Behavioral Research at the University of Delaware. Eleven experimental sessions including auctions and questionnaires were conducted in 2010 and a sample of 128 was attained. The agricultural products included egg, tomato, beef and milk. For the analysis, two methods were applied, factor analysis and structural equation modeling. Exploratory factor analysis was conducted on identification of latent factors representing consumers' perception of organic and local food. Then the SEM method was applied to the test of latent factors and their relationships with consumers' WTP and purchase behavior for organic and local food under the framework of the TPB model. Comparisons between organic and local food and different types of food within organic and local version were also made.

Results supported the applicability of the TPB to the understanding and prediction of consumers' intentions and behaviors for organic and local food. In general, attitude and norm showed positive effects on WTP; while perceived behavioral control (PBC) exerted significant negative effect on purchase behavior; norm was found to be a significant positive predictor for attitude for both organic and local food. However, comparison between models of different kinds of organic and local food indicated that results varied between different food products and there existed attitude-WTP and intention-behavior gaps in several models. These findings suggested several potential directions for researchers and marketers to better understand consumers' intentions and purchase for organic and local food, such as (i) discovering and including other psychological constructs which mediate impacts of attitude and WTP on behavior, especially for local food; (ii) develop different measures for psychological variables of various kinds of food which have different attributes associated.

Chapter 1

INTRODUCTION

1.1 Background and Motivation

The US organic food market has been growing tremendously over the past ten years. According to the Organic Trade Association (2014), total organic food sales in 2013 experienced the fastest growth in five years. The volume of sales increased to $35.1 billion at a growth rate of 11.5%, while in the meantime conventional food sales only rose 3.7%.

As to the local food market, it accounts for a small yet fast growing share of total US agricultural sales. Although there is no consensus on a definition of "local food" in terms of the geographic distance between production and consumption, the definition of "local" or "local food system" based on marketing arrangement (e.g. farmers selling food directly to consumers at regional farmer's markets or schools) is well recognized. For instance, in the 2008 Food, Conservation, and Energy Act (2008 Farm Act), the U.S. Congress defines that a product transported within 400 miles from its origin or within the State it is produced can be considered a "locally or regionally produced agricultural product". Census of agriculture data from US Department of Agriculture (USDA, 2012) estimated that local food sales totaled $6.1 billion in 2012, an increase of 650% compared to $812 million in 2002. According to the Agriculture Resource and Management Survey US Department of Agriculture (USDA, ARMS, 2014), the number of farmer's markets in the US rose to 8,268 in 2014, nearly five times as many as there were in 1994.

The prosperity of organic and local foods reflects that they are more than for human's basic needs but an expression of identity and worldviews (Senauer, 2001). They provide associated food values which are essentially naturalness and

healthiness (Lusk and Briggeman, 2009; Nie and Zepeda, 2011). Therefore, knowing the motivations and determinants of consumers for organic and local food is useful for producers who want to promote food sales, as well as policy makers who aim to support the organic and local food markets.

The choice of food is a complex behavior influenced by a wide range of factors. Consumer's willingness to pay (WTP) gives a useful tool in finding the amount that consumers would be willing to pay for the associated characteristics of organic and local food. While measurement of mean WTP can provide implications on consumers' interests, the determinants of WTP are more useful if we want to have a deeper insight of consumers' choice of food. However, relatively little is known about how and why people choose the foods that constitute their diets or about how their choices are influenced in an effective way (Shepherd et al., 1995). To understand what determine consumers' WTP and their purchase behavior, attitudes and motivations and specific beliefs are useful. This research studies the factors which determine consumers' WTP and behavior as well as the relationship between these factors in the context of the Theory of Planned Behavior.

Expectancy-value models have been the most popular paradigms for the prediction and understanding of human behavior (Eagly et al., 1993). Of these models, the Theory of Planned Behavior (TPB) (Ajzen, 1985; 1991) is one of the most widely applied conceptual frameworks for the study of consumer behavior. The basic idea of TPB is that an individual's behavioral intention is the most proximal predictor of behavior. Behavioral intention, in turn, is a function of attitudes, subjective norms and perceived behavior control. The TPB was chosen as theoretical frame in the current study because it had several advantages: (a) unlike many other theories which simply catalog the likely influences, the TPB provides a framework for quantitative modeling of food choice behavior (Shepherd, 1989); (b) the TPB breaks down intention and behavior into several determinants and thus provides an elegance in its simplicity to quantify the

relative importance of each factor; (c) the TPB has been successfully applied within the literature to predict a wide range of consumer behaviors (Conner and Sparks, 1996), such as health behavior (Godlin and Kok, 1996), and food choice (Nurse et al., 2010; Michaelidou and Hassan, 2008; Shaw et al., 2000; Sparks et al., 1995; Beale and Manstead, 1991; Sparks and Shepherd, 1992, 2002; Towler and Shepherd, 1992). Several meta-analyses have demonstrated the predictive power of the TPB (Shepherd et al., 1988; Conner and Armitage, 1998; Armitage and Conner, 2001). Therefore one of our motivations was to test the applicability of the TPB in understanding and predicting consumers' intentions and behaviors for organic and local food.

Structural Equation Modeling (SEM) (Jöreskog, 1973; Bentler, 1980) allows a pattern of dependences and correlations to be imposed on latent factors. Therefore SEM can be applied to test the applicability of the TPB. In the study, this is conducted by specifying a corresponding TPB model and using empirical experimental data to estimate the values of free parameters in the path diagram. Attitude, norms and perceived behavioral control (PBC) were modeled to impact consumers' WTP and purchase behavior for organic and local food. Interpretation of the quantitative analysis of both organic and local model will provide useful information of relative influences of different psychological variables. Furthermore, a comparison between the organic and local food model will be a constructive addition to the existing literature.

Additionally, the motivation for many researchers utilizing the TPB has been to increase the variance explained in intentions and behavior by including additional variables (Conner and Armitage, 2002). An additional aim of this study was to test a useful extension of the basic model by including moral dimensions such as personal norm and self-identity, which would hopefully provide a clearer understanding of the normative factors that influence consumer choice of organic and local food.

1.2 Purpose

The main purpose of this research was to investigate the determinants that influenced consumers' WTP and purchase behavior for organic and local food, as well as the relationships between the determinants. Another goal was to use the empirical data to test the validity of the Theory of Planned Behavior in explaining consumers' intentions and behavior for different organic and local food. This study may be beneficial to producers, marketers and policy marketers by providing useful information on what factors influence consumers' WTP and purchase for organic and local food. Results of this study can also provide some evidence on the validity and efficacy of the application of the TPB to food choice related fields.

1.3 Organization of Thesis

The structure of this study is as follows. Following this introduction is a literature review. The first part is a general review of the existing studies on organic and local food. Questions regarding consumers' preferences, concerns over quality and environmental issues, and WTP for organic and local food are reviewed. The second part is a review of the Theory of Planned Behavior. The components, the framework, the application, the strength and the concerns of the theory are discussed. The following part gives a short review on consumer willingness to pay and experimental auctions. The last part reviews the method of structural equation modeling and discusses its usefulness in conducting consumer analysis.

In chapter three, the methodology adopted in this study is displayed. First the experimental design was discussed by describing the process of the experimental auction and the components of the questionnaire. Next the method of exploratory factor analysis is specified to be used to uncover the underlying latent dimensions in the empirical data. Finally, the method of a two-step SEM model is discussed.

Chapter four discusses the preliminary data analysis results. To start with, demographic profiles are displayed and discussed. Then an analysis of WTP of different food types is displayed. The results of factor analysis are also reported in this section. Finally, based on the results of factor analysis, the SEM models are specified by developing the measurement and structural model.

In chapter five, the results from the measurement model for organic and local food are displayed. The intercorrelations between different variables are also included. The structural models are revised and improved in several phases by comparing model-fit indices. Then the results from the final models are displayed and interpreted. Finally, a comparison is made between the TPB models for different kinds of food products.

Chapter six focuses on both theoretical and practical implications and discusses contributions and limitations of this study. The final chapter, chapter seven, summarizes the conclusions and potential future studies.

Chapter 2

LITERATURE REVIEW

2.1 Organic and Local food

This study focused on two fastest growing food trends in the US: organic and local food. Most existing studies regarding organic and local food focus on three questions: 1) who buys organic and local food? 2) why they do so? 3) how much do they pay for it?

Studies focused on the organic food market in US and Europe showed that purchase of organic food was essentially motivated by beliefs about safety, healthiness and good taste of the products as well as beliefs about benefits for the environment and the welfare for animals (Baker et al., 2004; Dimitri and Greene, 2002; Grunert and Juhl, 1995; Magnusson et al., 2001; Zanoli and Naspetti, 2002). In a review by Harris et al. (2000) it was demonstrated that the pesticide issue was also an important psychological motivation and freshness was the most important sensory factor in selecting organic food. However in a study that integrated existing findings Hughner et al. (2007) argued that consumers of organic food were not homogenous in demographics or in beliefs, therefore further study is needed in understanding the variety of consumers' motivations, perceptions and attitudes regarding organic food.

A large number of works have studied consumers' preferences and WTP for organic food in North America (Jolly et al., 1989; Jolly, 1990; Wolf, 2002; Harris, 1997; Bernard et al., 2006; Govindasamy et al., 2006; Bernard and Bernard; 2009, 2010; Van Loo et al., 2011; Akaichi et al., 2012). Many factors have been found to affect the WTP for organic food. For instance, Williams and Hammitt (2000) surveyed over 700 customers in major retail stores in the northeastern US region and found that attitudinal variables such as trust in food

safety, perceived benefits associated with organic food, and perceived risk reduction were important determinants of WTP of organic food. Lusk and Briggeman (2009) demonstrated that food value such as safety, nutrition, and taste were significantly related to consumers' preferences for organic food; consumers who placed higher importance on naturalness, fairness and the environment were more likely to state a higher WTP for organic food. Scarpa and Thiene (2011) conducted a study on WTP for organic carrots and argued that fear for food-related risk were important motivations to purchase organic food.

Socioeconomic variables, for instance, income, education, occupation, are widely considered as determinants of WTP for organic food. However, despite strong evidence that socio-economic profiles play an important role in determining consumers' preference, some studies found it insignificant or had unexpected effect on WTP. For example, Gifford et al. (2005) studied consumer WTP for non-GM and organic food and found that opinion variables were better predictors while socio-economic variables had insignificant effect. Krystallis and Chryssohoidis (2005) found that consumers' stated WTP and factors that affected it differed according to the organic food category. These factors included food quality, trust in the certification, and brand name. Prices and consumers' socio-demographic profiles did not constitute determinants of organic WTP.

Additionally, major obstacles to the organic market discussed in the existing body of research are access availability (Huang, 1996; Davis et al., 1995), price (Demeritt, 2002), and information (Estes et al., 1994). For example, Demeritt (2002) reported that the three most important reasons why consumers did not buy organic food were lack of information (59%), followed by high price (39%) and limited availability (16%).

However, when it comes to local food, the situation becomes complex. There is no generally accepted definition of local food because the definition of the meaning of the term "local" varies with geography, supply chain distance, consumer, purpose, data availability (Martinez, 2010) and ownership of the farm

(Adams and Adams, 2011). According to the definition adopted by the US Congress in the 2008 Food, Conservation, and Energy Act (2008 Farm Act), a product of which the total transportation distance is less than 400 miles from its origin, or within the State in which it is produced, can be considered as a "locally or regionally produced agricultural food product". However, the applied definition when it comes to the statistics and estimates of local food market development is based on market arrangements, including direct-to-retail arrangements such as farm sales to schools or direct-to-consumer arrangements such as regional farmer's markets. Therefore, there is no consensus in the literature on the definition of "local food"

Several previous studies have explored consumer preferences and motivations for local food (Martinez, 2010; James et al., 2009; Zepeda and Li, 2006; Nie and Zepeda, 2011). Generally, consumers who value high-quality and nutrition value of food, positive local economy impact and environmental benefits are willing to pay more for local food. Darby et al., (2008) decomposed the attributes that consumers associate with purchasing local food, and demonstrated that these attributes included freshness, support for small farm and local economy, and environmental sustainability. Similar attributes have been demonstrated in several works, for example quality and freshness (Brown, 2003), nutrition (Loureiro and Hine, 2002), environmental benefits (Brown, 2003; Zepeda and Leviten-Reid, 2004), and helping farmers in the state (Carpio and Isengildina-Massa, 2009). Other factors influencing consumers' preferences for local food include knowing the source of the product (Food Marketing Institute, 2006), market accessibility (Hardesty, 2008), transportation cost or convenience (Zepeda and Li, 2006), and price (VerPloeg et al., 2010). Nie and Zepeda (2011) studied 956 US food shoppers on their purchase of organic and local food. Based on motivations of specific consumer groups, they identified four different consumer types and showed the importance of personal psychological factors and lifestyles in shaping attitudes which in turn affected intentions and behaviors regarding

organic and local food choices. Major barriers associated with purchase of local food included seasonal constraints, cost, limited availability, and limited information (Hardesty, 2008; Martinez, 2010).

Martinez (2010) reviewed eight studies on WTP for a wide range of locally produced food in 10 states of US. He found that the differences in consumers' WTP for different kinds of food products could be attributed to product perishability, base price, and regional differences in attitudes toward local food and food in general.

While previous studies have examined consumers' preferences for organic and local food, there are few studies that considered both two types simultaneously. One of these studies is by Loureiro and Hine (2002) who surveyed local supermarket customers in Colorado to find their WTP for organic, GMO-free, and locally grown food. It was found that consumers had the highest WTP for locally grown. Another study is by James et al. (2009) who conducted a survey on WTP for applesauce from local apples in Pennsylvania, and found the WTP for local applesauce was higher than for applesauce labeled as organic.

This study adopted an experimental auction to examine consumers' WTP for eggs, tomatoes, beef and milk, which respectively represent different categories of food, namely egg, fresh, meat and dairy. The special focus was on organic and local eggs. Eggs are an interesting product to examine because it represents a unique food category and at the same time has a variety of attributes associated with them. For example, it is considered to be high-protein, but also high-cholesterol. Furthermore, the per capita consumption level of eggs has increased from 248.3 in 2008 to 260.7 in 2014 (USDA- WASDE, 2015) which means on average each consumer consume 12 more eggs in 2014 than they did in just six years ago. Therefore there is much interest in understanding the trend in this industry.

2.2 The Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) (Ajzen, 1988, 1991) provides one of the most widely applied conceptual frameworks for studies on a wide range of consumer behaviors (Kaiser et al., 2005; Bagozzi et al., 2014; Conner and Armitage, 1998; Sheppard et al., 1995; Sutton, 1998). The history of the TPB can be traced back to the Fishbein's Expectancy-Value Theory (EVT) (Fishbein, 1963) which views individual's attitudes as developed and modified based on expected beliefs and values. The EVT was then refined, developed and tested to become the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980) which deals with the relations among beliefs, attitudes, norms, intentions, and behavior. Later Ajzen developed the TPB as an extension of the TRA, addressing the explanatory weaknesses with the TRA by including control belief and perceived behavioral control.

According to the framework of TPB (as shown in Figure 2.1), an individual's behavior is directly determined by behavioral intentions which, in turn, are predicted by (a) attitudes which reflect the individual's positive or negative opinion of a behavioral option; (b) subjective norm which is the social pressure from family members and peers to enact the behavior and (c) perceived behavioral control which refers to the perceived ease or difficulty of performing the behavior (Ajzen, 1988). Essentially, the TPB implies a link between attitudes and behavior that is mediated by intentions. As a general rule, a more positive attitude and subjective norm and a greater perceived behavioral control should strengthen the individual's intention to perform the specific behavior; the stronger the intention, the more likely should the related behavior be performed by the individual (Ajzen, 1991). In accordance with the TPB model, we take it that people who have a positive attitude towards organic and local food, who perceive support from their surroundings, and also believe in their own ability to take an active part in supporting the community and protecting the environment should be more willing to purchase organic and local food.

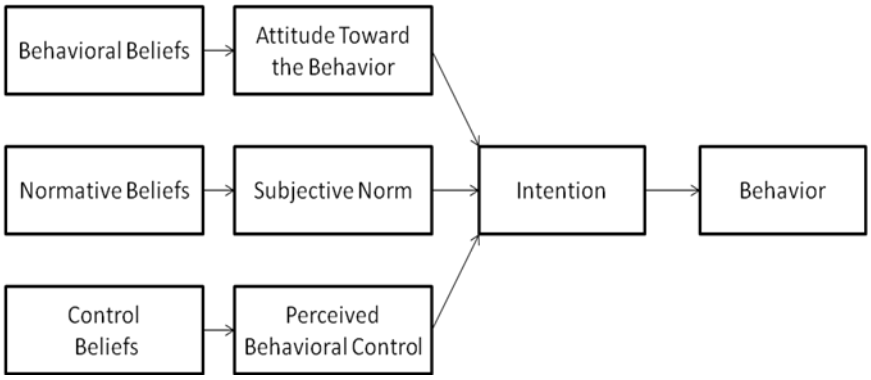

Figure 2.1 Conceptual Model of the TPB

Attitude towards the behavior is the individual's evaluation of performing a specific behavior and can be positive or negative. Attitude is predicted by the product of beliefs about outcomes of the behavior and the individual's evaluations of these outcomes.

Subjective norm is the individual's perception of the social pressures which are put on the individual in the process of performing or not performing the behavior. In general, people will have intention to perform a specific behavior if they evaluate it to be good or positive and they believe that specific influential people or group (e.g. family member, friend, peer, doctor) think they should behave in that way. Subjective norm is determined by the product of normative beliefs and the motivation to comply with them.

PBC is the perceived beliefs about factors that may facilitate or impede the performance of the behavior. For example, the performing of a specific behavior may be limited by factors such as money, time, skills, resources, opportunities, availability, circumstances, etc. The TPB differs from the TRA in adding the new component PBC, which addresses the weakness of lacking predictive and explanatory power when dealing with situations under which individuals have incomplete volitional control. The meaning of the term incomplete volitional control is that the likelihood of behavioral achievement is to some extent dictated

by the resource and opportunities available to an individual (Ajzen, 1991). For example, the performing of a specific behavior may be limited by control factors—money, time, lack of skills, resources, opportunities, or cooperation of other people—which are not entirely under the control of the individual. A meta-analysis reported by Conner and Armitage (1998) found that on average, the component of PBC added 5% to the variance explained in intention, over and above attitude and subjective norm, and added 1% to the variance explained in behavior, over and above intention. In a similar fashion with attitude and subjective norm, PBC is predicted by the sum of specific control beliefs modified by the perceived power of the control factors to facilitate or inhibit performance of the behavior (Ajzen, 1991).

Factors such as demographic variables, social role, status, and socialization, intelligence, and kinship patterns do not enter the theory as an integral part because all the factors were considered to be external variables and may have an effect on behavior only when they influence the determinants of the behavior (Fishbein and Ajzen, 1980).

There are two basic assumptions behind the TPB. The first is that human beings are rational and goal-oriented when making decisions (Conner and Armitage, 1998). The second one is that before deciding upon action, individuals can make systematic use of information and consider available options as well as the related consequences (Ajzen, 2005).

The main objective of the TRB is to predict and understand an individual's behavior of various kinds by a single theoretical framework. A number of meta-analyses have demonstrated the predictive power of the model (Shepherd et al., 1988; Conner and Armitage, 1998; Armitage and Conner, 2001; Godin and Kok, 1996). For example, meta-analyses of the TPB show that the models explain, on average, between 40%-50% of the variance in intention and 19%-38% of the variance in behavior (Sutton, 1998).

However, the TPB model has been criticized and challenged by several studies for its insufficient consideration of normative influences on behavior (Shepherd et. al., 1995; Armitage and Conner, 2001; Sparks and Shepherd, 2002). The construct of subjective norms which refer to perceived social pressure to perform or not to perform the behavior in the original TPB model makes it a more restricted concept. Therefore, researchers have suggested that a measure of personal norm or moral norm can be a useful addition into the TPB model (see review by Conner and Armitage, 1998). Personal norm, which was first introduced by Schwartz (1977), differs from the concept of social norms in that it refers to internalized norms (i.e. each individual's own view of what is right and wrong) rather than socially shared rules. In Conner and Armitage's (1998) meta-analysis, moral norm[1] was a significant predictor of intentions. Studies have shown independent predictive power of personal norm and moral norm on behavioral intentions, for example green consumer behavior (Jansson et al., 2010), donating blood (Pomazal and Jaccard, 1976), health-related behavior (Godin and Kok, 1996) and self-harm behavior (Conner and Armitage, 2003).

Although food choice is a less obvious domain within which such moral obligation factors might operate, moral or ethical issues are nonetheless important in particular instances such as areas which include animal welfare in food production or the application of new techniques (Shepherd et al., 1995). The role of personal norms—the internalized feeling of an individual' moral obligation to act in a certain way—has also been examined in the context of food choice. Thogersen (2002) investigated the behavioral influences of personal norms with regard to purchase of organic red wine and found that consumers' choice between organic and conventional wine depends on their personal norms, after controlling for attitudes and social norms. In this study, personal norm was recognized by two

[1]The concepts of moral norms and personal norms have often been used interchangeably in the literature, and thus can be seen as identical with each other.

items: “I feel I ought to choose organic…” and “I feel obligation to choose…”. Furthermore, in another study by Thogersen and Olander (2006), they found that personal norm was the most important predictor of consumers’ purchase frequency of various kinds of organic food based on a three-year panel survey. They showed that the stronger are consumers’ personal norms about buying organic food, the greater the likelihood that they change their purchase patterns in favor of organic food. Arvola et al. (2008) applied the TPB in predicting intentions to purchase organic apple and pizza in three countries of Europe. They incorporated the measure of moral influences into the model of the TPB and found that personal norms played a considerable role in predicting intentions to purchase organic food.

Besides personal norm, self-identity is another suggested extension of the TPB model. Self-identity basically represents individual’s answer for question “who am I” which refers to salient and enduring aspects of one’s self-perception (Rise et al., 2010). Shepherd et al. (1995) summarized various extensions made for the basic TPB model, including self-identity and moral obligation factors. They argue that although the interpretation of self-identity is still debatable, it may reflect the inability of attitude measures to assess various emotional factors and such extension may offer a potential means toward a better understanding of different factors determining food choices. Sparks and Shepherd (1992) incorporated the concept of self-identity into the TPB model in a study of the consumption of organic vegetables by two questions designed for the identification with green consumerism: “I think of myself as a green consumer” and “I think of myself as someone who is very concerned with green issues”. They found that self-identity had a high correlation with behavioral intention of purchasing organic vegetables and the model fit was increased by adding this dimension. Armitage and Conner (1999) also found self-identity to be a significant independent predictor for consumption of low-fat diets and a useful addition to the TPB. Similar results were found in Cook et al. (2002), Smith et al.

(2007) and Bonne et al. (2007) that when added as an additional predictor, self-identity had strong predictive power in the TPB. In a meta-analysis of the TPB model by Rise et al. (2010), self-identity has been found to contribute to an increment of 6% additional variance in behavioral intention and explain 9% additional variance in behavior after controlling for attitude, subjective norms and PBC.

Based on previous studies that have shown the need to enhance the ability of the TPB in capturing moral influences of behavior, not only is this study being conducted under the basic framework of the TPB, but also being extended by incorporating extensive variables such as self-identity and personal norms.

To date, the TPB model has been successfully applied to a wide range of consumer behavior studies (Bagozzi et al., 2014; Conner and Armitage, 1998; Sheppard et al., 1995; Sutton, 1998). Food-related behavior is especially a focus of TPB application by a number of studies, such as healthy eating (Conner et al., 2002, 2000; Louis et al., 2009), dietary food (McConnon et al., 2011, Povey et al., 2000; Armitage and Conner, 1999; Nejad et al., 2004); food safety (Milton and Mullan, 2012; Mullan and Wong, 2010), religious food (Bonne et al., 2007; Alam et al., 2011), and adolescent food choices (Pawlak et al., 2008; Dennison and Shepherd, 1995; Hewitt and Stephens, 2007). Several studies (Sparks and Shepherd, 1992; Magnusson et al., 2001; Tarkiainen and Sundqvist, 2005; Arvola et al., 2008) have analyzed the influences of psychological factors on WTP for organic food in the context of the TPB while relatively few studies have tested the TPB model for local food (Nurse et al., 2010). Furthermore, very few studies have tested the TPB for organic and local food simultaneously. For instance, Nurse et al. (2010) conducted a study on WTP for apples and tomatoes that labeled organic, local, and certified fair trade. However, due to the data limitation, the full TPB model was only applied to evaluate WTP for local apples and tomatoes. Therefore, this study contributes to the existing body of work in developing a coherent and quantitative model for both organic and local food.

2.3 Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM) is a statistical technique which is a combination of confirmatory factor analysis (CFA) and path analysis. It was first developed by Joreskog (1973) and has gained popularity across many disciplines such as marketing and psychology in the past two decades due to its analytic generality and flexibility (Steenkamp and Baumgartner, 2000).

SEM estimates the coefficients and residual variances for dependences of measured variables on latent factors and for dependences of latent factors on other latent factors (Bentler, 1989) and can be represented in equation form as:

$$\eta = \mathrm{B}\eta + \tau\xi \qquad (1)$$

Where η is a column vector of dependent variables (observed variables and latent factors that are dependent on other latent factors), ξ is a column vector of independent variables (latent factors and residuals), B is a matrix containing the coefficients for the regression of η-variables on each other and τ is a matrix containing the coefficients for the regression of η-variables on ξ-variables.

SEM is a useful tool to determine the extent to which the theoretical framework is supported by the empirical data. SEM was chosen to be used in the current study because it has three advantages: 1) Compared with other regression models which solely include observed variables, SEM allows for latent variables which cannot be directly measured or observed (Bollen, 1989). This strength makes SEM a powerful tool in fields such as consumer behavior, social psychology, and health behavior analyses where latent variables underlying theoretical constructs are often used. 2) Compared with basic statistical methods, SEM allows for multiple dependent variables and independent variables and therefore is capable of dealing with more sophisticated theories to be modeled and tested. For this reason, SEM techniques are becoming the preferred method for confirming (or disconfirming) theoretical models in quantitative fashion (Schumacher and Lomax, 2010). 3) SEM techniques take measurement error into

account when a latent variable of interest is represented by multiple manifest variables. In other word, SEM includes not only variances in manifest variables that reflect hypothesized latent scale, but also unique variances that reflect something else, including measurement errors. This provides the opportunity to work with perfectly reliable causes and effects within the structural model (Rourke et al., 2013), since with measurement error taken into account, SEM does not need to assume that manifest variables are perfectly reliable without errors. This is also useful to measure how well a hypothetical variance-covariance matrix replicates the observed sample variance-covariance matrix and thus is helpful to determine whether the construct model fits the empirical data well.

2.4 Willingness to Pay (WTP) and Experimental Auctions

Willingness to pay (WTP) is the maximum amount an individual would be willing to pay for a good. The magnitude of WTP can provide valuable information because it measures the value consumers are willing to place on particular attributes associated with the good. Also the knowledge of WTP is important for companies to customize their pricing strategy and thus to increase profitability. Therefore, WTP plays an important role in studies on food choice especially for organic food (Baltzer, 2004; Wolf, 2002; Gifford et al., 2005; Bernard et al., 2006; Bernard and Bernard; 2009, 2010; Krystallis and Chryssohoidis, 2005; Gil, 2000; Akaichi et al., 2012).

There are quite a lot of methods for measuring WTP. According to the data collection methods, Breidert et.al (2006) classified the methods into two broad types: 1) Revealed Preference which can be obtained from price-responses and 2) Stated Preference which is derived from direct or indirect surveys. The experiment-based technique, which yields revealed preference data, is a major and widely applied type of method for the estimation of WTP. Generally, experiments include both laboratory experiments and field experiments. In laboratory settings, typically subjects or participants are given a fixed amount of money and are then

asked to make a choice among specific selections of goods while in the field experiments, participants will perform in a real-world shopping environment. For the laboratory experiment, the major advantage is that researchers can control the settings in accordance with their research interests and the data can be obtained quickly. However, the drawback is that the participants know they are under the experimental situations, which may lead to the problem of bounded rationality and low external validity (Nessim and Dodge, 1995). Auctions in laboratory settings have been widely employed for eliciting consumers' WTP, especially the WTP for organic food and other agricultural products (Bernard and Bernard, 2009, 2010; Shi et.al, 2013; Elbakidze el.al, 2013; Bi et. al, 2012; Muller and Ruffieux, 2011; De Groote et.al, 2011; Akaichi et al., 2012). Among the popular methods, the Vickery (Vickrey, 1961) auction is one of the incentive compatible auctions which are commonly applied. In the Vickrey second-price sealed bid auction, the participant with the highest bid receives the item, but he or she only needs to pay the price equal to the second highest bid. The dominant strategy in the Vickrey auction for an individual participant is to reveal his or her true valuation, otherwise the welfare decreases either by paying too much or losing the right to buy the good he or she wants.

As discussed in the first section of this chapter, numerous studies on WTP have been prompted by the growing share of organic food. In contrast, although local food tended to be viewed positively by consumers, there have been few studies on WTP for local food in the US. Furthermore, except for several studies that examined specific foods (Bernard and Bernard, 2009; Millock et al., 2002; Scarpa and Thiene, 2011; Darby et al., 2008; James et al., 2009), most of the studies involved organic or local products in general. Therefore there is no clear evidence in terms of which organic products attract higher premiums (Bonti-Ankomah and Yiridoe, 2006). This study not only looks at organic and local food simultaneously, but also emphasizes several specific organic and local products, such as egg, tomato, beef, and milk.

Chapter 3

METHODOLOGY

3.1 Experimental Design

In designing the experiment, a preliminary questionnaire which consisted of nine open-ended questions was used to elicit consumers' beliefs about organic and local food. It was filled out by 25 randomly chosen subjects during the University of Delaware's Ag Day, and 75% of the beliefs found in the questionnaire were included in the final questionnaire.

The experiment session contained an auction and a questionnaire. For the auction part, at the beginning participants were taught the rules of the auction through a brief explanation of the optimal strategy and a round of practice. The aim of the practice was to make sure that participants understood that the optimal strategy was to bid their true value for the product. After making sure that every participant understands the mechanism, the actual auctions were conducted. The auction was a sealed-bid Vickrey fourth-price auction, of which the rule was that for each auction session, the highest three receive the product, but only pay the price of the fourth highest bid. Before subjects started bidding for the food products, they were informed that there was one pre-determined binding auction, which would be revealed at the end of the experiment. An envelope containing the binding food product and version was to be chosen randomly by one of the participants and was displayed in front of the subjects throughout the experiment. During the actual auctions, definitions of each version of the products were given by an administrator at the time subjects were exposed to the product sets. A sheet of definitions for the different versions was handed out as well. The definitions for each version were designed to be neutral using information from the USDA. Subjects were told that most food fit into the conventional category. The

conventional versions were explained as not being organic or local, with no information about whether they were produced using antibiotics, hormones, GM, pesticides, and chemical fertilizers. These latter attributes were however noted as being approved by and within government standards and limits. Organic food was defined as having no irradiation, no GM ingredients, no hormones or antibiotics, no synthetic pesticides, and no petroleum or sewage sludge fertilizers. As for local food, participants were not given any standard definition but the information that the food could be assumed to be purchased within a close distance.

For the questionnaire part, after the auctions each participant filled out a survey. The survey mainly contained the measurements for the following aspects informed by the TPB model: 1) consumers attitudes toward organic and local food; 2) self-identity and social pressure for organic and local food consumption; 3) perceived consumption availability and perceived behavioral control beliefs. Additionally, past and future organic or local food purchase and demographic questions were included. All questions were measured on a seven-point Likert scale with 1 being "strongly disagree" or "very unimportant' or "not at all" and 7 being "strongly agree" or "very important" or "very often". At the end of each session, participants were paid about $45 in cash, including any earnings from practice auction, and the food products if they were high bidders in the binding auction. Details of the questionnaire are shown in Appendix A.

3.2 Factor Analysis

This study applied the method of exploratory factor analysis (EFA) as a data dimension reduction method to identify the latent structure of different sets of measures as well as a precursory method to latent variable modeling of confirmatory factor analysis (CFA).In this way, it contributed to the understanding of latent dimensions underlying different psychological items. In this study, EFA was conducted separately for different groups of attitudinal variables—attitude,

norms, and perceived behavior control to discover if there existed any sub-groups of variables that reflected similar meanings.

Due to the high correlations within the measures, oblique rotation was applied. Besides, since the Kaiser (eigenvalue above one) criterion was less appropriate in oblique rotation common factor analysis (O'Rourke et al., 2013), the scree test and the proportion of variance accounted for each factor were used to determine the factors to retain. According to the Hair et al. (2006) table of loading for practical significance, a cutoff of 0.5 is reasonable for a sample size between 120 and 150. Since this study had a sample size of 128, the cutoff of 0.5 was chosen and therefore items with factor loadings smaller than 0.5 were dropped from further analysis. If an item was loaded on more than one factor, then the item would also be dropped from further analysis.

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy (MSA) measures the appropriateness of factor analysis. For the KMO statistics Kaiser (1974) recommends a minimum of 0.5, therefore values below that would be removed from further analysis. The Cronbach's (1951)alpha coefficients for each factor were used to assess the internal consistency of the items in measuring the same factor. Generally accepted threshold levels for Cronbach's alpha are 0.6 for explorative studies and 0.7 for confirmatory studies (Hair et al., 2006; Nunnally, 1978); in the current study we chose 0.7 to be the criteria.

Once EFA was applied and the latent dimensions underlying the data set was uncovered, weighted sum factor scores were created where the factor loading of each retained item was multiplied to the standardized score for each item before summing. The method of weighted sum scores was chosen because of its advantage that items with high loadings on the factor would have large effects on the factor score (Distefano et al., 2009). By doing this, the strength (or lack of strength) of each item would enter the model and thus be helpful to increase the explanatory power of the model. The factor scores were retained as the representations of each respondent's placement on the factors identified from the

EFA and were used as manifest variables for the following confirmatory factor analyses and latent variable modeling.

3.3 Structural Modeling

This study used SAS CALIS procedure (SAS Institute Inc., 1989) to analyze the data with the maximum likelihood algorithm. Following a two-stage approach recommended by Anderson and Gerbing (1988), a measurement model was first estimated using confirmatory factor analysis to develop an acceptable latent structure, and then a structural model which specified the hypothesized causal relationships between the latent constructs was developed and assessed.

3.3.1 Measurement Model

A measurement model was first developed and assessed using confirmatory factor analysis (CFA) to ensure that the variables extracted to reflect the same latent factors were indeed highly correlated with each other and therefore reliable. In addition, reliability analysis was assessed to test the internal consistency of the variables by using Cronbach's (1951) alpha coefficient which must exceed 0.7 and the correlation between the factors which must be higher than 0.3 (Nunnally, 1978). The adequacy of each multi-item variable for capturing its respective construct was also tested. Thus, the internal validity and reliability of the measurement model was examined by calculating the composite reliability and average variance extracted. Composite reliability (CR) is a measure of internal consistency comparable to Cronbach's coefficient of alpha (Fornell and Larcker, 1981) while average variance extracted (AVE) is a measure of the amount of variance captured by the latent construct relative to the variance due to random measurement error. The recommended reliability level for CR differs in the literature from 0.6 to 0.8 (Bagozzi and Yi, 1988; Hair et al., 2006; Fornell and Larcker, 1981; Nunnally and Bernstein, 1994). Generally 0.7 is preferable to be the minimally acceptable level used in research (O'Rourke et., 2013; Nunnally,

1978) thus 0.7 was used in the current study as the benchmark level. The desirable threshold level for AVE suggested in previous studies is 0.5 (Fornell and Larcker, 1981; Hair et al., 2006), meaning that 50% or more variance being captured by the factor.

Consistent with the TPB model, three latent constructs (attitude, norm, PBC) were formed from manifested variables (i.e. factors extracted from the explanatory factor analysis) for organic and local food measurement model.

3.3.2 Structural Model

After testing the validity and reliability of the latent constructs by the measurement model, a hypothesized structural model was proposed involving variables discussed above to represent the causal relationships of interest. The model was consistent with the hypotheses informed by the TPB and was developed to test the relationships between attitude, norms, perceived behavior control, WTP and purchase behavior. To be specific, a favorable attitude or norm towards organic or local food is likely to strength consumers' WTP for organic or local food. Besides, a greater perceived behavioral control would lower the intentions for organic and local food. In addition, the stronger the intention, the more likely should the related purchase behavior be performed by the individual.

Joreskog and Sorbom (1996) demonstrated that the results of structural models should be interpreted in terms of the significance of coefficients and in terms of the goodness of fit of the whole model. When it comes to goodness of fit, the use of multiple indexes is generally recommended. The indexes selected for the current study are: comparative fit index (CFI), goodness of fit index (GFI), normed fit index (NFI), adjusted goodness fit index (AGFI), chi-square (χ^2), and robustness of mean squared error approximation (RMSEA). The CFI, GFI, NFI, AGFI should be close to 0.9 or 1.0 (Bentler and Bonett, 1980; O'Rourke et., 2013) and the error measure approximation should not exceed 0.1 and ideally be between 0.05 and 0.08 (Hair et al., 2006). Following this, the final structural

model would be modified and developed in several phases by comparing the model fits, Chi-square tests, and estimate of path coefficients between different versions of structural model in order to improve the explanatory power of the original model.

Finally, the final TPB models would be compared between different types of organic and local food, namely egg, tomato, beef, and milk, so as to test the applicability and predictive power of the final models themselves.

Chapter 4

DATA ANALYSIS

4.1 Respondents

The experimental sessions were carried out in the Experimental Economics Laboratory for Policy and Behavioral Research at the University of Delaware in August 2010. There were eleven sessions and participants were recruited through email lists, flyers and advertisements.

A total of 128 samples were retained during the experiment. A description of the respondents' demographic profile is shown in Table 4.1.

Table 4.1 Summary of Demographics Profile

		Number	%
Gender			
	Male	55	43.0%
	Female	73	57.0%
Age	16-25	30	23.4%
	26-35	37	28.9%
	36-45	18	14.1%
	46-55	22	17.2%
	56-65	12	9.4%
	66 or above	9	7.0%

Table 4.1 Summary of Demographics Profile (continued)

		Number	%
Ethnicity			
	White	98	76.6%
	Black or American African	11	8.6%
	Hispanic or Latino	7	5.5%
	American Indian or Alaskan Native	2	1.6%
	Asian	7	5.5%
	Other	3	2.3%
Income			
	Less than $10,000	13	10.2%
	$10,000-$14,999	4	3.1%
	$15,000-$19,999	20	15.6%
	$20,000-$24,999	16	12.5%
	$25,000-$34,999	20	15.6%
	$35,000-$49,999	19	14.8%
	$50,000-$74,999	11	8.6%
	$75,000-$99,999	15	11.7%
	$150,000-$199,999	6	4.7%
	$200,000 or more	4	3.1%
Education			
	Less than High School	2	1.6%
	High School	21	16.4%
	Some College	32	25.0%
	College	44	34.4%
	Post Graduate	29	22.7%
State			
	DE	112	87.5%
	MD	7	5.5%
	NJ	1	0.8%
	PA	7	5.5%
	Other	1	0.8%
Primary Shopper			
	Yes	92	71.9%
	No	36	28.1%
Children			
	Yes	36	28.1%
	No	92	71.9%

Table 4.1 Summary of Demographics Profile (continued)

	Number	%
Farming Experience		
Yes	35	27.3%
No	93	72.7%
Vegetarian		
Yes	8	6.3%
No	120	93.8%
CSA		
Yes	5	3.9%
No	123	96.1%

The sample consisted of 73 females (57.0%) and 55 males (43.0%). The age group of 26 to 35 constituted the largest proportion of the sample with 37 respondents (28.9%), while the age group of 66 or above had the smallest number with 9 respondents (7.0%). The average age was about 39. The ethnicity of most respondents was white (76.6%). As to total household income, 75 respondents (57.5%) fell into the income group of earning between $15,000 and $50,000 per year. A smaller yet considerable amount of subjects (25.0%) reported an annual income from $50,000 to $200,000.

The majority of the respondents were well educated, with 105 of them (82.0%) reported having at least college education or above. Most respondents lived in Delaware (87.5%), while other respondents lived in Maryland (5.5%), Pennsylvania (5.5%) and New Jersey (0.8%). A high percentage of the respondents (71.9%) reported that they were the primary shopper of their family. Meanwhile 36 of the respondents (28.1%) had at least one child below the age of 18. Most respondents (72.7%) did not have any farming experience. A small proportion of respondents were vegetarians (6.3%) and only 5 respondents (3.9%) indicated that they were members of CSA farms.

4.2 WTP Analysis

The simple statistics of consumers' WTP for organic and local version for different kinds of products were reported in Table 4.2.

Table 4.2 Simple Statistics of WTP and Wilcoxon Signed-rank Test P-values

	organic		local		p-value
	mean	st dev	mean	st dev	
egg	2.81	1.46	2.20	1.29	<0.0001
tomato	3.12	1.39	2.71	1.28	<0.0001
beef	3.21	1.71	2.75	1.42	<0.0001
milk	3.69	1.88	3.34	1.64	<0.0001

From the simple statistical analysis of the WTP, generally speaking, consumers had higher WTP for organic food than for local food. The highest difference in mean of WTP was found in egg, with organic version ($2.81) exceeding local version ($2.20) by an amount of $0.61. Since the bidding data were not normally distributed, the non-parametric Wilcoxon signed-rank tests were conducted to test whether the WTP differed in organic and local versions. The hypothesis tested was that the WTP for organic food and that for local food have the same mean. Table 4.2 shows the p-values from the tests. For all kinds of organic and local food (egg, tomato, beef, and milk), the null hypotheses of same means were rejected ($p<0.0001$), indicating a highly statistically significant difference between the WTP for organic version and for local versions. Moreover, it can also been seen from the one-sided p-values (which were calculated by dividing the two-sided p-values by two) that organic WTPs were significantly higher than local WTPs. Therefore, from the pooled data it can be concluded that consumers had significantly different intentions for organic and local food.

4.3 Factor Analysis

Exploratory factor analysis (EFA) was applied as a data reduction method to discover the number and nature of the factors that were responsible for covariance in the data set under each structure. The method of EFA may be used

as a precursor to latent variable modeling or confirmatory factor analysis (CFA) (Schumaker and Lomax, 2004).In this study, EFA was conducted separately for items under each constructs—attitude, norms, and perceived behavior control to reduce the large amount of items in the questionnaire to a smaller sets of latent components. Due to the high correlations within factors, oblique rotation was applied.

The KMO value had a range from 0.72 to 0.87 which fell into the range recommended by Hutcheson and Sofroniou (1999) of being "good" to "great", indicating that the data was suitable for factor analysis. The cut-off level for Cronbach's alpha coefficients was 0.7, which resulted in the removal of several items in order to improve reliability. However, it was noticeable that most of the items which were expected to measure a specific dimension or construct did load on the same factor. The results of the factor analysis are shown in Table4.3-Table 4.8.

4.3.1 Attitude

Eight items (see Appendix A) were designed in the questionnaire to assess consumers' attitudes towards organic food while thirteen items were designed to measure attitudes towards local food. The value of attitude was calculated as the product of the value of the outcome beliefs and the corresponding value of the outcome evaluation.

For organic food, two factors, respectively named Personal Direct Gain and Community & Environmental Gain, were extracted by EFA. The items under each factor, the factor loadings, the eigenvalues, the explained variance, and the Cronbach's alpha values are reported in Table 4.3.

Table 4.3 Factor Analysis of Attitude for Organic Food

Factor and Questionnaire Items	Factor Loadings
Personal Direct Gain	
Improving my health and the health of my family	0.91
Getting better quality food	0.85
Purchasing safer food	0.83
Purchasing better tasting food	0.75
Eigenvalue=4.89	
Variance Accounted=87.79%	
Cronbach's Alpha=0.93	
Community & Environmental Gain	
Supporting sustainable farming practices	0.82
Supporting small family farms	0.81
Benefitting the environment	0.62
Improving animal welfare	0.50
Eigenvalue=0.68	
Variance Accounted=12.21%	
Cronbach's Alpha=0.86	

The first factor had four items significantly loaded on it. The items were all related with the direct personal utility gained from purchasing and consuming organic food, such as food healthiness, safety, freshness and quality. Therefore the first factor was named Personal Direct Gain. All the items had factor loadings larger than 0.7 and therefore were retained for further analysis. The factor had the eigenvalue of 4.89 and accounted for 87.79% of all the variances. The value of Cronbach's alpha was 0.93, indicating a highly reliable factor structure.

The second factor was named Community & Environmental Gain, which had four items loading on it. This factor referred to the indirect gain from purchasing and consuming organic food, including supporting communities, benefiting environment, and improving animal welfare. It accounted for 12.21% of the variance with an eigenvalue of 0.68. The value of Cronbach's alpha was 0.86, suggesting a strong internal consistency.

For local food, thirteen items were designed to understand consumers' attitude, from which three factors were extracted and retained, respectively named Personal Direct Gain, Social & Community Gain, and Environmental Gain. The Cronbach's alpha had a range from 0.82 to 0.92, indicating there was no problem of internal inconsistency under the factor structure. The details for each factor construct are summarized in Table 4.4.

Table 4.4 Factor Analysis of Attitude for Local Food

Factor and Questionnaire Items	Factor Loadings
Personal Direct Gain	
Purchasing better tasting food	0.84
Getting better quality food	0.81
Obtaining fresher food	0.80
Improving my health and the health of my family	0.58
Purchasing safer food	0.53
Eigenvalue=6.93	
Variance Accounted=82.11%	
Cronbach's Alpha=0.92	
Social & Community Gain	
Developing personal relationship with farmers	0.81
Supporting small family farms	0.77
Supporting sustainable farming practices	0.76
Supporting the rural community	0.72
Eigenvalue=1.02	
Variance Accounted=12.09%	
Cronbach's Alpha=0.92	
Environmental Gain	
Benefiting the environment	0.68
Reducing gasoline consumption due to transportation (lower food miles)	0.62
Improving animal welfare	0.56
Eigenvalue=0.49	
Variance Accounted=5.80%	
Cronbach's Alpha=0.82	

Similar to organic food, the first factor had five items which all referred to direct gain from consuming local food, including taste, quality, freshness, healthiness and safety. Therefore the factor was also named “Personal Direct Gain”. The only difference between this factor and that of organic food was that it had an additional item of being able to “obtaining fresher food”. The explanation for this difference might be that consumers generally referred freshness more to

local food than to organic food. The factor accounted for 82.11% of the variance between the items with an eigenvalue of 6.93. This factor passed reliability test with a Cronbach's alpha of 0.92, indicating it was highly reliable.

The second factor had four items loaded under the construct which were all related to indirect benefits from purchasing local food, such as social benefit (develop personal relationship with farmers) and community benefits (support small family farms, sustainable farming and rural community. Therefore it was reasonable to label this factor as Social & Community Gain. The factor explained 12.09% of the total variance and had a Cronbach's alpha of 0.92, suggesting a robust and coherent dimension.

Three items with factor loadings larger than 0.5 were found to load on the last factor which was labeled as Environmental Gain. The factor had a reliability score of 0.82 and thus showed a high internal consistency. In contrast to organic food, this factor related to environmental protection was extracted separately for local food. This difference might indicate that consumers had more confidence on environmental benefits brought by purchasing local food (e.g. beliefs that local food can reduce gas consumption due to lower food miles). Future studies could research on this concern for a deep exploration.

4.3.2 Norms

For organic food, ten items were selected to understand consumers' norms (see Appendix A) and EFA elicited two factors, namely Personal Norms and Social Norms. Cronbach's alpha coefficient was used to test the internal consistency of the scale items and that resulted in the removal of two items "If I wanted to, it would be easy to purchase organic food" and "I will look for organic food next time I go food shopping" in order to improve reliability. The results of factor analysis for organic food are summarized in Table 4.5.

Table 4.5 Factor Analysis of Norms for Organic Food

Factor and Questionnaire Items	Factor Loadings
Personal Norms	
I consider myself a green consumer	0.76
I consider myself a typical buyer of organic food	0.74
I think of myself as a health conscious consumer	0.67
I feel that I have an ethical obligation to purchase organic food	0.50
Eigenvalue=2.98	
Variance Accounted=83.92%	
Cronbach's Alpha=0.78	
Social Norms	
Buying organic food makes me feel like a better person	0.55
I tend to do what people who are important to me think I should do	0.55
Most people who are important to me think I should purchase organic food	0.50
I felt I ought to bid more for organic food	0.45
Eigenvalue=0.57	
Variance Accounted=16.08%	
Cronbach's Alpha=0.67	

There were four items under the first factor. All the items had factor loadings greater than 0.5 and therefore were retained for the further analysis. The items were all related with consumers' self-identity and internalized feelings of personal moral obligation to purchase organic food therefore it was reasonable to label this factor as Personal Norms. The factor had the eigenvalue of 2.98 and accounted for 83.92% of all the variances. The value of Cronbach's alpha was 0.78, indicating a reliable factor structure.

The second factor, Social Norms, was created by four items that were significant loading on it. We followed Hair et al. (2006) in that items with a loading smaller than 0.5 would be dropped from further analysis, however in this case item "I felt I ought to bid more for organic food" was retained due to intuitive rationale even though the factor loading was slightly less (0.45).These four items

dealt with the perceived social pressure from specific reference people (e.g. family member, friend, doctor) to buy organic food. This factor accounted for 16.08% of the variance with an eigenvalue of 0.57. The value of Cronbach's alpha is 0.67, indicating a not very desirable reliability; however taken as a group this construct performed fairly well. Moreover, keeping this factor could be justified by the argument raised by Nunnally (1978) that a satisfactory level of reliability depends on the purpose and the stage of the research. In the early stage of the research it is acceptable to work with instruments that have only modest reliability.

Results of factor analysis of local food are reported in Table 4.6.

Table 4.6 Factor Analysis of Norms for Local Food

Factor and Questionnaire Items	Factor Loadings
Social Norms	
Buying local food makes me feel like a better person	0.80
I feel that I have an ethical obligation to purchase local food	0.76
I felt I ought to bid more for local food	0.55
Most people who are important to me think I should purchase local food	0.50
Eigenvalue=2.13	
Variance Accounted=81.92%	
Cronbach's Alpha=0.77	
Personal Norms	
I consider myself a green consumer	0.60
I think of myself as a health conscious consumer	0.60
Eigenvalue=0.47	
Variance Accounted=18.08%	
Cronbach's Alpha=0.63	

Similarly, for the local version, two factors—Social Norms and Personal Norms—were kept after EFA. The factor of Social Norms has four items significantly loading on it. It could be seen that these items were related to consumers' moral obligation to buy local food, which was mostly perceived from

surrounding social pressure. The factor had the eigenvalue of 2.13 and accounted for 81.92% of all the variances. The value of Cronbach's alpha was 0.77, indicating a good scale reliability.

Personal Norms had two items loading on it. These two items, which were "I consider myself a green consumer" and "I think of myself as a health conscious consumer", represented consumers' self-identity regarding to green consumerism. Self-identity has been suggested to be a useful modification for the TPB model by several studies because a person's self-identity was believed to influence behavior independently of attitude (Rise et al., 2010; Shepherd et al., 1995; Sparks and Shepherd, 1992). Since it measured consumers' self-perception and self-concept in terms of "who am I", it could be seen as dimension under personal norm.

This factor accounted for 18.08% of all the variances with an eigenvalue of 0.47. The value of Cronbach's alpha for Personal Norms was 0.63, suggesting a not very desirable reliability. This might be due to the common problem of lacking reliability when there were only two indicator variables under this latent factor (Anderson and Gerbing, 1988). In the current analysis, however, this factor was retained for local model because it had theoretical implication and also served as a counterpart of the same factor in organic model.

4.3.3 Perceived Behavioral Control

For consumers' perceived behavior control part, two factors were extracted for organic and local food (see Table 4.7 and Table 4.8).In the original theoretical construct, PBC was measured from a third dimension named perceived availability (Nurse el al., 2010; Vermeir and Verbeke, 2008; Sparks and Shepherd, 1992) which measured consumers' perceived external barriers affected by practical difficulties such as price, information, and access availability. However, this dimension was omitted because of low reliability. Although it had theoretical importance in the construct of the PBC, keeping it in the model could decrease the reliability of the other estimates.

For organic food, two factors were extracted. The results of EFA are reported in Table 4.7.

Table 4.7 Factor Analysis of Perceived Behavior Control for Organic Food

Factor and Questionnaire Items	Factor Loadings
Conservatism	
There is nothing wrong with conventional farming practices	0.76
Conventional farming practices are the most efficient	0.62
You can't feed the world with organic food	0.56
Organic food is a fad	0.53
Eigenvalue=2.72 Variance Accounted=81.92% Cronbach's Alpha=0.77	
Perceived Consumer Effectiveness	
No matter what I buy, I can't influence the food system by myself	0.87
No matter what I buy, I can't have an influence on the environment by myself	0.85
Eigenvalue=0.60 Variance Accounted=18.08% Cronbach's Alpha=0.90	

The first factor was named Conservatism, since the items under this structure were all related to consumers' opinions influenced by conventional farming and their preference for conventionally produced food over the trend of organic food. The factor had the eigenvalue of 2.72 and accounted for 81.92% of all the variances. The value of Cronbach's alpha was 0.77, indicating a reliable factor structure.

The second factor was named Perceived Consumer Effectiveness with two items significantly loading on it. These two items was labeled because they all referred to consumers' perception that whether their food purchase behavior can effectively influence the food system or the environment. The extraction of this

factor was in accordance with the findings from Roberts (1996), Vermeir and Verbeke (2008), and Nurse et al. (2010) in that perceived consumer effectiveness has been suggested to enter the model of the TPB. In the current study, this factor accounted for 18.08% of the variance with an eigenvalue of 0.60. The value of Cronbach's alpha was 0.90, suggesting a strong internal consistency.

For local food, two factors were extracted. Results are summarized in Table4.8.

Table 4.8 Factor Analysis of Perceived Behavior Control for Local Food

Factor and Questionnaire Items	Factor Loadings
Perceived Consumer Effectiveness	
No matter what I buy, I can't influence the food system by myself	0.87
No matter what I buy, I can't have an influence on the environment by myself	0.83
Eigenvalue=1.92	
Variance Accounted=80.67%	
Cronbach's Alpha=0.90	
Conservatism	
Conventional farming practices are the most efficient	0.65
There is nothing wrong with conventional farming practice	0.65
Eigenvalue=0.46	
Variance Accounted=19.33%	
Cronbach's Alpha=0.70	

Similarly, the items under the dimension of perceived availability were removed as a result of unacceptable reliability. The first factor had two items significantly loading on it. These two items both measured consumers' internal control belief about the confidence on their influence on food system and environment by purchasing local food. Thus the factor was labeled as perceived consumer effectiveness. It accounted for 80.67% of the variance with an

eigenvalue of 1.92. The value of Cronbach's alpha was 0.90, suggesting an ideal internal consistency.

Two items with factor loadings greater than 0.5 were found to be loading on the second factor. These two items reflected consumers' control beliefs in favor of conventional farming and therefore the factor was named conservatism. The item "Local food is a fad" was removed because of insignificant contribution to the prediction of the factor. This factor has the eigenvalue of 0.46 and accounts for 19.33% of all the variances. The value of Cronbach's alpha is 0.70, indicating a reliable factor structure.

4.4 Model Structure Analysis

This study followed a two-step approach recommended by Anderson and Gerbing (1988), with a measurement model first estimated using confirmatory factor analysis and then a structural model used to test hypothesized causal relationships.

4.4.1 Measurement Model

Consistent with the TPB model, attitude, norm, PBC were formed from six manifested variables extracted from the EFA for organic food and seven manifested variables for local food model.

For organic food, the first latent construct "Attitude" was formed based on two attitudinal variables, namely personal direct gain and community& environmental gain. The second latent construct "Norm" was formed by two manifest variables, namely, personal norm and social norm. The last latent construct "Perceived Behavioral Control" or "PBC" was based on two variables, namely, conservatism and perceived consumer effectiveness.

For local food versions, the first latent "Attitude" was formed based on three manifested variables, namely personal direct gain, society and community gain, and environmental gain. The second latent construct "Norm" was formed by

two manifest variables, namely, social norm and personal norm. The third latent construct, "Perceived Behavioral Control" was based on two variables, which were perceived consumer effectiveness and conservatism.

Measurement models for organic and local food versions were depicted in Figure 4.1 and Figure 4.2. Following Bentler's (1989) convention of drawing of the path diagrams and the rule of naming error terms, latent factors were represented by elliptical shapes while manifest variables were represented by rectangles. Error items were represented by the letter E (for Error) and manifest variables were identified with the letter V. These measurement models did not specify any causal relationships between the latent constructs of interest, because at this stage each latent variable was allowed to be correlated with each other. These correlations were captured by curved, two-headed arrows which connected each latent factor with every other latent factor.

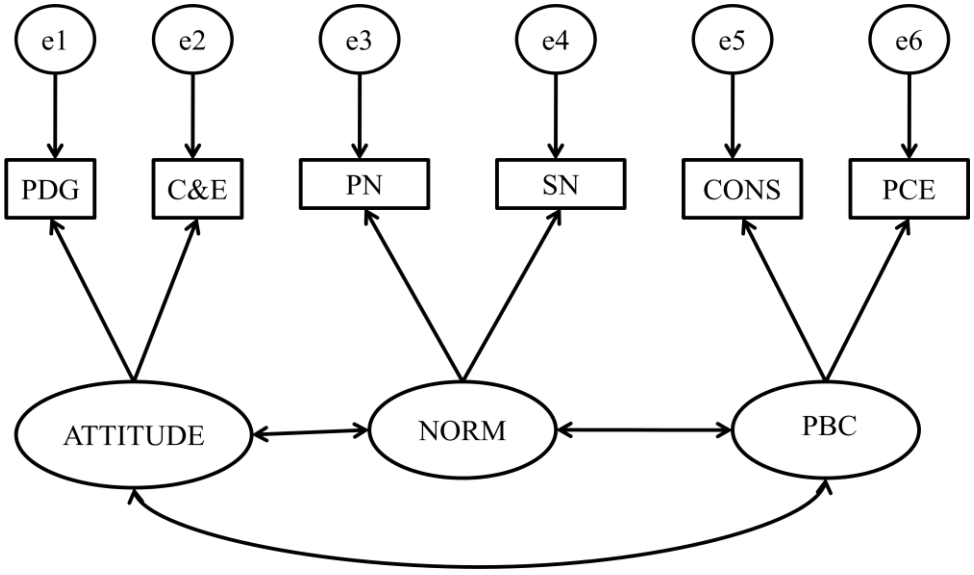

Figure 4.1 CFA Model: Testing the Latent Constructs of the Organic Food

Note: PDG: Personal Direct Gain; C&E: Community & Environmental Gain; PN: Social Personal Norm; SN: Social Norm; CONS: Conservatism; PCE: Perceived Consumer Effectiveness; PBC: Perceived Behavior Control

Figure 4.1 presents the measurement model to be tested for organic food. As with the theoretical model discussed above, the model consists of three latent factors: Attitude, Norm, and PBC. Attitude has two manifest indicator variables which are personal direct gain (PDG) and community& environmental gain (C&E). Norm has two manifest variables: personal norm (PN) and social norm (SN). The last latent construct PBC is based on two variables: conservatism (CONS) and perceived consumer effectiveness (PCE). Notice that all structural variables in the model (attitude, norm, PBC) are allowed to covary freely with one another, as shown by the curved, two-headed arrows in the figure.

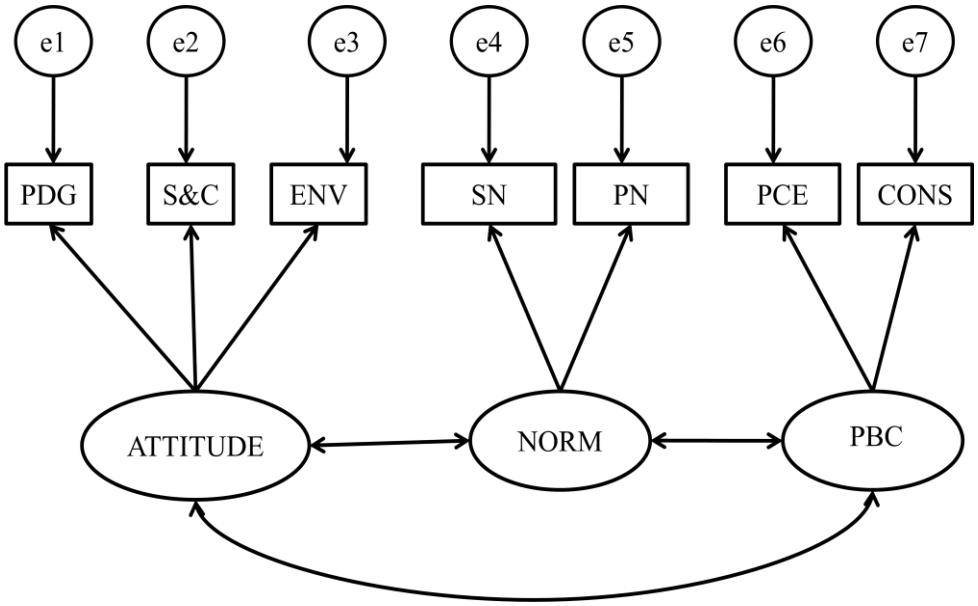

Figure 4.2 CFA Model: Testing the Latent Constructs of the Local Food

Note: PDG: Personal Direct Gain;S&C: Society & Community Gain; ENV: Environmental Gain; SN: Social Norm; PN: Personal Norm; PCE: Perceived Consumer Effectiveness; CONS: Conservatism; PBC: Perceived Behavior Control

Figure 4.2depicts the measurement model for local food. The measurement model for local food is identical to that for organic food, except for that the latent construct of attitude in local model is measured by three psychological factors

instead of two in the organic model. Attitude now has three manifest indicator variables which are personal direct gain (PDG), society & community gain (S&C), and environmental gain (ENV). The rest of the model is as same as that of the organic model. All structural variables in the model (attitude, norm, PBC) are also allowed to covary freely with one another.

4.4.2 Structural Model

Consistent with the hypotheses in the TPB, a favorable attitude or norm towards organic or local food is likely to strength consumers' WTP for organic or local food. Besides, a greater perceived behavioral control would lower the intentions for organic and local food. In addition, the stronger the intention, the more likely should the related purchase behavior be performed by the individual. It is therefore hypothesized as follows:

H_1: A positive attitude or norm towards organic and local food is likely to increase consumers' WTP for organic and local food (positive effect).

H_2: Perceived behavioral control is likely to decrease consumers' WTP for organic and local food (negative effect).

H_3: A stronger WTP is likely to increase the possibility and frequency for future purchase behavior (positive effect).

In this way, a hypothesized structural model can be specified by involving variables discussed above to represent the causal relationships of interest. Figure 4.3 and Figure 4.4 depict the structures of the models. The exogenous constructs were modeled to have direct impacts on consumers' attitude, norms, and perceived behavior control and indirect impacts on WTP and purchase behavior.

In graphical form, a directional arrow is used to indicate a hypothesized causal direction, which means the variable where the arrow originates exerts causal influence on the variable where the arrow points toward. Consistent with the measurement models discussed above, indicator variables were enclosed in rectangles and latent variables were enclosed in elliptical shapes. Error items for

manifest endogenous variables were identified by the letter E which was done in exactly the same way as in the measurement models.

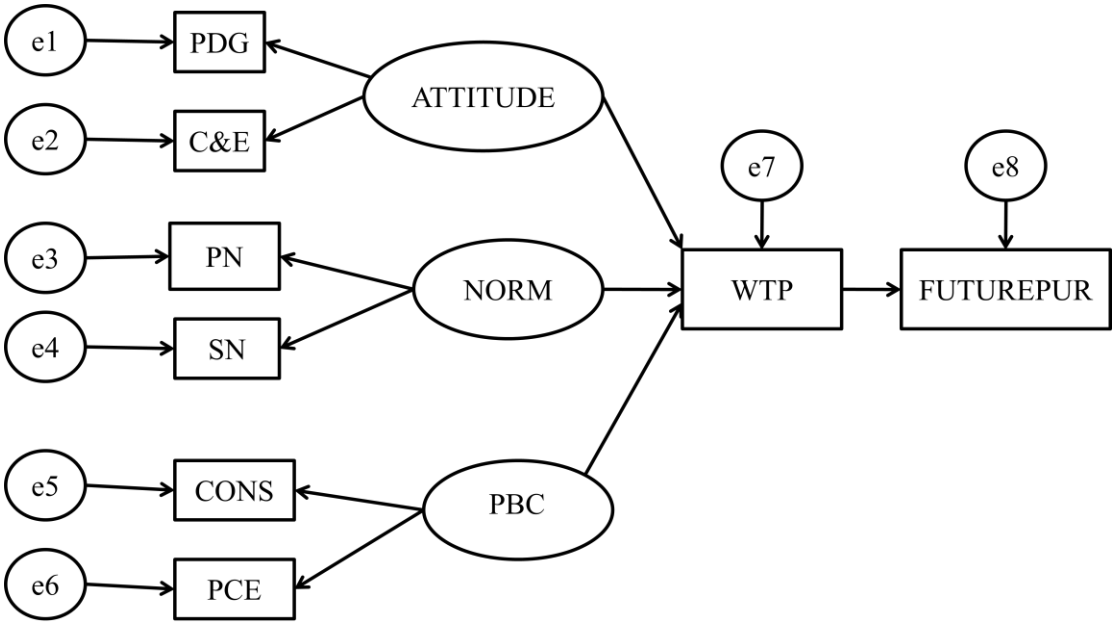

Figure 4.3 Original Structural Path Diagram for the Organic Food

Note: PDG: Personal Direct Gain; C&E: Community & Environmental Gain; PN: Social Personal Norm; SN: Social Norm; CONS: Conservatism; PCE: Perceived Consumer Effectiveness; PBC: Perceived Behavior Control; WTP: Willingness to Pay; FUTUREPUR: Future Purchase Behavior

Figure 4.3 presents the theoretical model that describes predicted relationships between the constructs in the organic TPB model. According to this model, WTP is expected to be directly affected by attitude, norms, and PBC. Future purchase behavior (FUTUREPUR), in turn, is expected to be affected directly by WTP and indirectly by attitude, norms and PBC.

The structural model for local food (see Figure 4.4) is identical to the model of organic food, except that the latent scale of consumers' attitude towards local food is measured by three manifest indicator variables instead of two in the organic model.

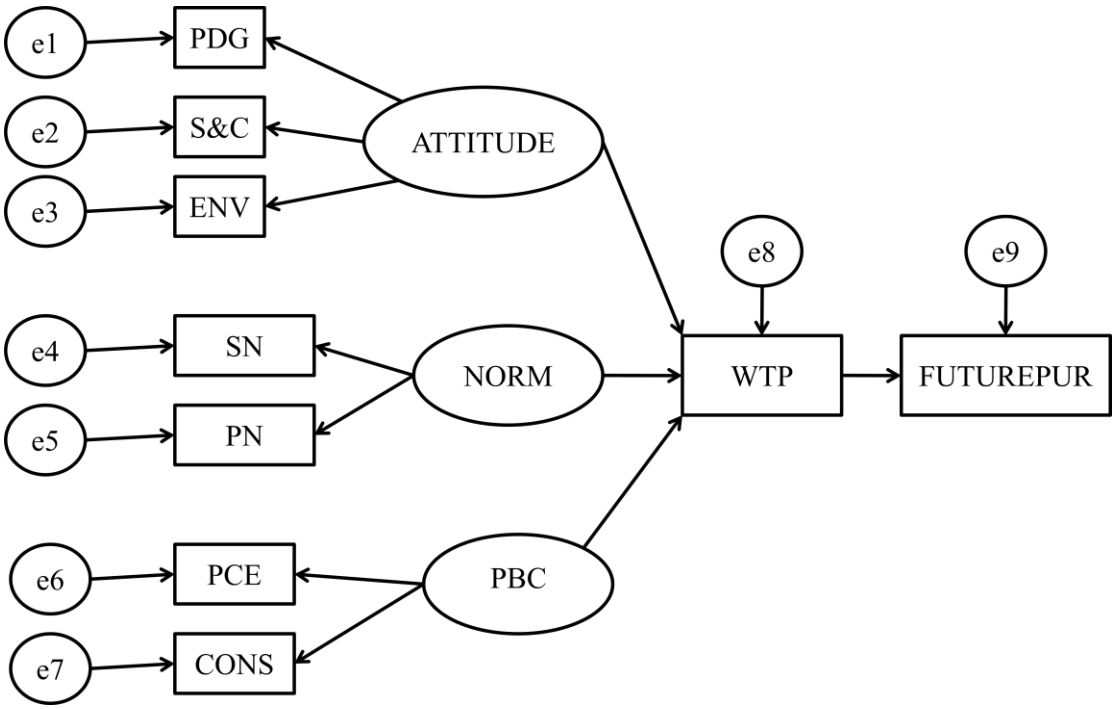

Figure 4.4 Original Structural Path Diagram for the Local Food

Note: PDG: Personal Direct Gain; S&C: Society & Community Gain; ENV: Environmental Gain; SN: Social Norm; PN: Personal Norm; PCE: Perceived Consumer Effectiveness; CONS: Conservatism; PBC: Perceived Behavior Control; WTP: Willingness to Pay; FUTUREPUR: Future Purchase Behavior

Chapter 5

RESULTS

5.1 Measurement Model

In this study data were analyzed using SAS System's CALIS procedure, and the models tested were covariance structure models with multiple indicators for latent constructs. Standard deviations and intercorrelations for the manifest variables (i.e. factors which were extracted from the explanatory factor analysis discussed in Chapter four)are presented in Table 5.1 and Table 5.2. The present study analyzed the data with the maximum likelihood algorithm. Following a two-step procedure recommended by Anderson and Gerbing (1988), confirmatory factor analysis was first used to develop a measurement model which demonstrated an acceptable fit to the data. In the second step, a structural model was developed based on the measurement model so that it came to represent the theoretical model of the TPB. This structural model was then tested and revised until a theoretically meaningful and statistically acceptable model was found.

Table 5.1 Standard Deviations and Intercorrelations for Manifest Variables, Organic Food (n=128)

	v1	v2	v3	v4	v5	v6
Standard Deviation	0.962	0.927	0.918	0.896	0.872	0.925
Personal Direct Gain	1.000					
Community & Environmental Gain	0.718	1.000				
Personal Norm	0.682	0.622	1.000			
Social Norm	0.652	0.527	0.760	1.000		
Conservatism	-0.355	-0.258	-0.480	-0.312	1.000	
Perceived Consumer Effectiveness	-0.295	-0.249	-0.364	-0.220	0.682	1.000

Table 5.2 Standard Deviations and Intercorrelations for Manifest Variables, Local Food (n=128)

	v1	v2	v3	v4	v5	v6	v7
Standard Deviation	0.962	0.954	0.926	0.896	0.855	0.916	0.802
Personal Direct Gain	1.000						
Social & Community Gain	0.611	1.000					
Environmental Gain	0.720	0.719	1.000				
Social Norm	0.572	0.559	0.503	1.000			
Personal Norm	0.613	0.627	0.592	0.751	1.000		
Perceived Consumer Effectiveness	-0.156	-0.042	-0.183	-0.070	-0.220	1.000	
Conservatism	-0.137	-0.064	-0.040	-0.192	-0.221	0.439	1.000

As can been seen from Table 5.1 and Table 5.2, manifest variables under the same latent scales did highly correlate with each other, indicating an ideal internal consistency within the latent factor. For example, for the local food model personal direct gain was found to correlate highly (r=0.718) with community & environmental gain, another manifest variable under the same latent scale of attitude. In addition, these two tables showed that the correlation between the measures under attitude and those under norms for both organic and local food were high. For example in the model of organic food, personal direct gain correlated strongly with personal norm (r=0.682) and social norm (r=0.652), while community and environmental gain also correlated highly with personal norm (r=0.622) and social norm (r=0.527). Furthermore, attitude and norms in both organic and local data showed negative correlative relationship with the measurement of PBC, indicating that they were measuring the opposite feelings of consumers.

In the first phase, Confirmatory Factor Analyses (maximum likelihood, promax rotation) for the constructs of the TPB model were performed to assess the underlying structure of the variables in the models. The analyses were carried out separately for organic and local food. Results showed that all factor loadings (standardized regression weights) of individual factors were higher than the threshold of 0.5 suggested by Hair et al. (2006) according to the sample size of 128. All factors were significantly associated with their specified constructs ($p<0.001$). Besides, all the scales successfully passed the composite reliability (CR) index (above or close to 0.7) and the average variance extracted (AVE) value (above or close to 0.5) and therefore showed all scales have moderate to high reliability and validity.

Standardized factor loadings for the indicator variables and goodness-of-fit indices for the CFA models for organic and local food are presented in Table 5.3 and Table 5.4 respectively. Table 5.3 and Table 5.4 also provide the reliabilities of the indicators, along with the composite reliability (CR) which reflects internal

consistency and Average Variance Extracted (AVE) which measures the amount of variance that is captured by each construct.

Table 5.3 Results of Confirmatory Factor Analysis for Organic Food

Latent Constructs and Manifest Variables	**Factor Loadings(Standardized)**	**Indicator Reliability**
Attitude (CR[a]=0.8380, AVE[b]=0.7216)		
Personal Direct Gain	0.8879*** [c]	0.7884
Community & Environmental Gain	0.8092***	0.6548
Norm (CR=0.8616, AVE=0.7595)		
Social Identity	0.9710***	0.9428
Social Norm & Personal Norm	0.7591***	0.5762
Perceived Behavior Control (CR=0.8223, AVE=0.7010)		
Conservatism	0.9283***	0.8617
Perceived Consumer Effectiveness	0.7350***	0.5402
Goodness-of-Fit (with benchmark)	**Fit Statistics**	
χ2/DF (1-4)	2.1526	
GFI (>0.90)	0.9705	
AGFI (>0.80)	0.8966	
NFI (>0.90)	0.9680	
CFI (>0.90)	0.9822	
NNFI (>0.90)	0.9556	
RMSEA (<0.08)	0.0853	

Note: [a] CR: Composite Reliability; [b] AVE: Average Variance Extracted

[c] ***:significant at p<0.001

For the organic food CFA model, factor loadings for the latent constructs ranged from 0.7350 to 0.9710 and all of them were significant (p<0.001) indicating strong support for the convergent validity of the indicator construct (Anderson and Gerbing, 1988). As to composite reliability (CR), the coefficients for attitude, norm and perceived behavior control were 0.84, 0.86 and 0.82, respectively. The values were all higher than 0.70, which was a recommended benchmark for high internal reliability. Similarly, the average variance extracted estimates (AVE) values for attitude (0.72), norm (0.76), and perceived behavior

control (0.70) were higher than the recommended benchmark of 0.50. Goodness-of-fit statistics of the measurement model showed a good fit with the data (χ2/DF=2.15, GFI=0.97, AGFI=0.90, NFI=0.97, CFI=0.98, NNFI=0.96).

Table 5.4 Results of Confirmatory Factor Analysis for Local Food

Latent Constructs and Manifest Variables	**Factor Loadings(Standardized)**	**Indicator Reliability**
Attitude (CR=0.8666, AVE=0.6847)		
Personal Direct Gain	0.7867***[c]	0.6189
Social & Community Gain	0.8042***	0.6467
Environmental Gain	0.8879***	0.7884
Norm (CR=0.7992, AVE=0.6658)		
Social Norm	0.7931***	0.6290
Personal Norm	0.8382***	0.7026
Perceived Behavior Control (CR=0.8796, AVE=0.7963)		
Perceived Consumer Effectiveness	0.8912***	0.7942
Conservatism	0.6339***	0.4018
Goodness-of-Fit (with benchmark)	**Fit Statistics**	
χ2/DF (1-4)	2.0418	
GFI (>0.90)	0.9519	
AGFI (>0.80)	0.8775	
NFI (>0.90)	0.9501	
CFI (>0.90)	0.9733	
NNFI (>0.90)	0.9490	
RMSEA (<0.08)	0.0906	

Note: [a] CR: Composite Reliability; [b] AVE: Average Variance Extracted

[c] ***:significant at p<0.001

Similarly, for the local food CFA model, factor loadings for the latent constructs ranged from 0.6339 to 0.8879, indicating strong evidence of supporting construct validity. Composite reliability coefficients for attitude, norm and perceived behavior control were 0.87, 0.80 and 0.88, respectively. The CR values of all scales demonstrated a high level of internal reliability, with the values in excess of the benchmark of 0.70. The AVE values for attitude (0.68), norm (0.67), and perceived behavior control (0.80) were greater than or close to the

recommended benchmark of 00.50. Goodness-of-fit statistics of the measurement model (χ2/DF=2.04, GFI=0.95, AGFI=0.88, NFI=0.95, CFI=0.97, NNFI=0.95, RMSEA=0.09) showed that the model fit the data reasonably well.

5.2 Original Structural Model

Structural analysis was performed to test the original models presented in Figure 4.3 and Figure 4.4. The data for organic and local eggs was used first for model estimation. Standard deviations and intercorrelations were provided in Table 5.1 and Table 5.2. Analyses were performed on the variance-covariance matrix and the method of maximum likelihood was used for estimation of free parameters. The results of original structural equation models are summarized in Table 5.5 and Table 5.6.

Table 5.5 Parameter Estimates and Goodness-of-fit Statistics, Organic, Original

Standardized Path Estimates			
WTP	←	ATTITUDE	0.1323
WTP	←	NORM	0.1771
WTP	←	PBC	0.0426
ACTPUR	←	WTP	0.2859***
ATTITUDE	←	PDG	0.8940***
ATTITUDE	←	C&E	0.8036***
NORM	←	SOCIAL IDENTITY	0.9617***
NORM	←	SN&PN	0.7665***
PBC	←	CONS	0.9277***
PBC	←	PCE	0.7355***

Goodness-of-Fit (with benchmark)	**Fit Statistics**
χ2/DF (1-4)	3.4073
GFI (>0.90)	0.9181
AGFI (>0.80)	0.8035
NFI (>0.90)	0.8895
CFI (>0.90)	0.9169
NNFI (>0.90)	0.8448
RMSEA (<0.08)	0.1377

Note: * significant at p<0.05; ** significant at p<0.01; *** significant at p<0.001

Table 5.6 Parameter Estimates and Goodness-of-fit Statistics, Local, Original

Standardized Path Estimates			
WTP	←	ATTITUDE	0.2026
WTP	←	NORM	-0.0476
WTP	←	PBC	0.0131
ACTPUR	←	WTP	0.0478
ATTITUDE	←	PDG	0.7863***
ATTITUDE	←	S&C	0.8027***
ATTITUDE	←	ENV	0.8898***
NORM	←	SN	0.7930***
NORM	←	PN	0.8388***
PBC	←	PCE	1.0975***
PBC	←	CONS	0.6302**
Goodness-of-Fit (with benchmark)		**Fit Statistics**	
χ2/DF (1-4)		3.5136	
GFI (>0.90)		0.8926	
AGFI (>0.80)		0.7803	
NFI (>0.90)		0.8478	
CFI (>0.90)		0.8828	
NNFI (>0.90)		0.8083	
RMSEA (<0.08)		0.1407	

Note: * significant at p<0.05; ** significant at p<0.01; *** significant at p<0.001

Evaluation of the original structural models indicated unacceptable model fits to the data. As can be seen from Table 5.5 and Table 5.6, many causal paths linking two latent constructs were proved to be non-significant. In addition, a review of the models' goodness-of-fit indices also showed that the theoretical models were unsuccessful in accounting for the relationships between the latent constructs as many of the indices fell below the benchmarked levels. Combined, these results showed that the original structural model did not provide an acceptable fit to the data. Therefore, in order to improve model fit, the original models needed to be modified to arrive at a better-fitting model.

5.3 Revised (Final) Structural Model

The structural model was developed in several phases by comparing the model fits, Chi-square tests, and estimate of path coefficients between different versions of structural model in order to improve the explanatory power of the original model. Based on the results of comparative analyses it was decided to drop the path from PBC to WTP and allow PBC to predict behavior independently, and drop the path from norms to WTP and add a causal path from norms to attitudes. This model was considered as the best one and thus was retained as the final model. Figure 5.1 and Figure 5.2 depict the final structural models for organic and local food, respectively. Following discussion justifies these model modifications in both theoretical ground and empirical evidence.

When it comes to the influence of PBC on intention (WTP), Ajzen (1991, p.188) argues that the magnitude of the PBC-intention relationship depends upon the nature of behavior and situation: "The relative importance of attitude, subjective norm, and perceived behavioral control in the prediction of intention is expected to vary across behaviors and situations". For example, in situations where attitude is strong or where normative influences are powerful, PBC may be less predictive of intentions and a better predictor of behavior (Armitage and Conner, 2001). For such reason, Ajzen (1991) demonstrates the need for a direct relationship between PBC and behavior which fits the data better. Indirect evidence for this argument included studies that have shown taking PBC into account can indeed improve prediction of behavior (Ajzen, 2005 p.110-113) and studies that have found PBC explains approximately an additional 2 percent, on average, of the variance in behavior (Cheung and Chan, 2000; Armitage and Conner, 2001).

Under conditions where behavior from intention is likely to be hindered (where there are problems of volitional control), PBC should: 1) facilitate the implementation of behavioral intentions into action, and 2) predict behavior independently (Armitage and Conner, 1999). Therefore in revising the original

models, the path from PBC to WTP was dropped and a new path from PBC to actual purchase behavior was added to the structural models in order to improve the explanatory power of the original models. By doing this, PBC was no longer expected to moderate the intention-behavior relations, but was supposed to have direct effects on actual purchase behavior. Adding the path from PBC to FUTUREPUR was also consistent with the following rationale: no matter how strong the attitude is, the performance of behavior is at least partially influenced by personal and environmental barriers, thus "PBC represents people's actual control or lack of control over the behavior and could disrupt the intention-behavior relation" (Azjen, 1985).This modification can also be justified by Conner et al. (2000) which found that intentions were stronger predictors of behavior only when intensions were stable. In this study, consumers' intentions to purchase organic and local food were driven by many factors and thus changing constantly. As a result, behavior may be affected more by PBC instead of intentions.

The normative component has been argued by several studies that it is the weakest component in predicting intentions. Therefore, subjective norms have been deliberately removed from analysis by several authors (Arimitage and Conner, 2001; Shephard et al., 1988; Godin and Kok, 1996). Arimitage and Conner (2001) argue the reason is that normative beliefs are complex and multidimensional that cannot be sufficiently explained by single-item measures.

In this regards, previous studies have suggested that the ability of the TPB model can be enhanced by capturing more aspects of normative and moral influences. For example, adding the measure for personal norms has been demonstrated by several studies to be important factor in determining consumers intentions and behaviors for organic food (Thogersen, 2002; Thogersen and Olander, 2006; Arvola et al., 2008).

This study differs from the previous ones in that the concept of subjective norms in the original TPB model was enhanced by incorporating personal norms which measured the individual's internal self-identity and self-rewarding feelings.

The strong correlation between social norms and personal norms found in the data (see Table 5.1 and Table 5.2) was as expected because theoretically subjective norms and personal norms were interrelated constructs. In this study, norms reflected not only individuals' perceived external social pressure– individuals' perception of what others think they should do– but also internal moral values and rules which are motivated by individuals' self-identity and self-rewards/punishment system. In this regards, norms were treated as a latent scale of both social norm and personal norm. It was thus reasonable to re-conceptualize the measure of norms as moral attitudes since they basically captured individuals' moral attitudes towards organic and local food, from both internal and external. For this reason, a structural path from norm to attitude was added to the revised model.

Adding this path could be justified on theoretical grounds that originally in the TPB, all moral or normative influences on behavior are assumed to be mediated via the measures of attitudes and subjective norms (Ajzen and Fishbein, 1980, p.247). Moreover, adding this path could also be justified by the empirical fact that attitude, social norms, and personal norms concerning buying organic and local food products were strongly correlated with each other. The correlations among these behavioral intention antecedents were summarized in Table 5.1 and Table 5.2. As can be seen from the table, the correlations among factors under the scale of attitude and norms were high. The high correlations between attitude and social norms as well as between attitude and personal norms indicated that, the attitude towards purchase for organic and local food products was predominantly a moral attitude. Because the correlations among the attitude, subjective social norm, and personal norm measures were so strong, it was reasonable to add a causal path from norms to attitude. It can also be seen from Table 5.1 and Table 5.2 that the final two factors (conservatism and perceived consumer effectiveness) under the construct of PBC were only weakly or moderately correlated with

attitude scale, therefore suggesting that the revise of the model would not pose major methodological problems such as multi-collinearity.

The resulting final models are depicted by Figure 5.1 and Figure5.2. In sum, the resulting model consisted of two additional regression paths which linked PBC to future purchase and linked norm to attitude. Two paths, one from PBC to WTP, one from norm to WTP, were dropped from the original models.

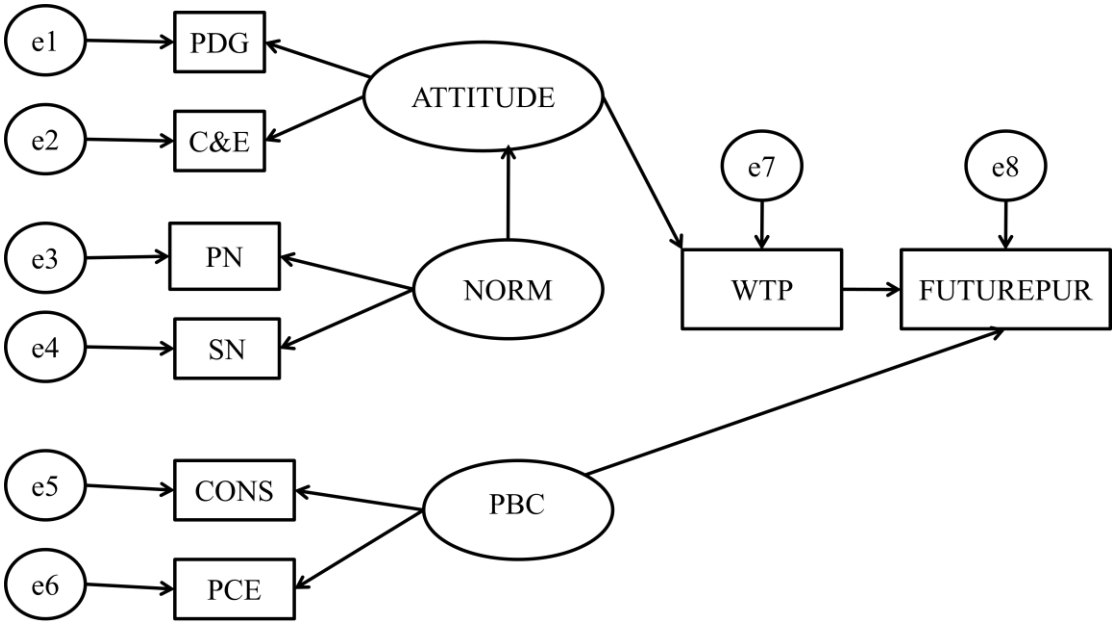

Figure 5.1 Revised Structural Path Diagram for the Organic Food

Note: PDG: Personal Direct Gain; C&E: Community & Environmental Gain; SN&PN: Social Norm and Personal Norm; CONS: Conservatism; PCE: Perceived Consumer Effectiveness; PBC: Perceived Behavior Control; WTP: Willingness to Pay; FUTUREPUR: Future Purchase Behavior

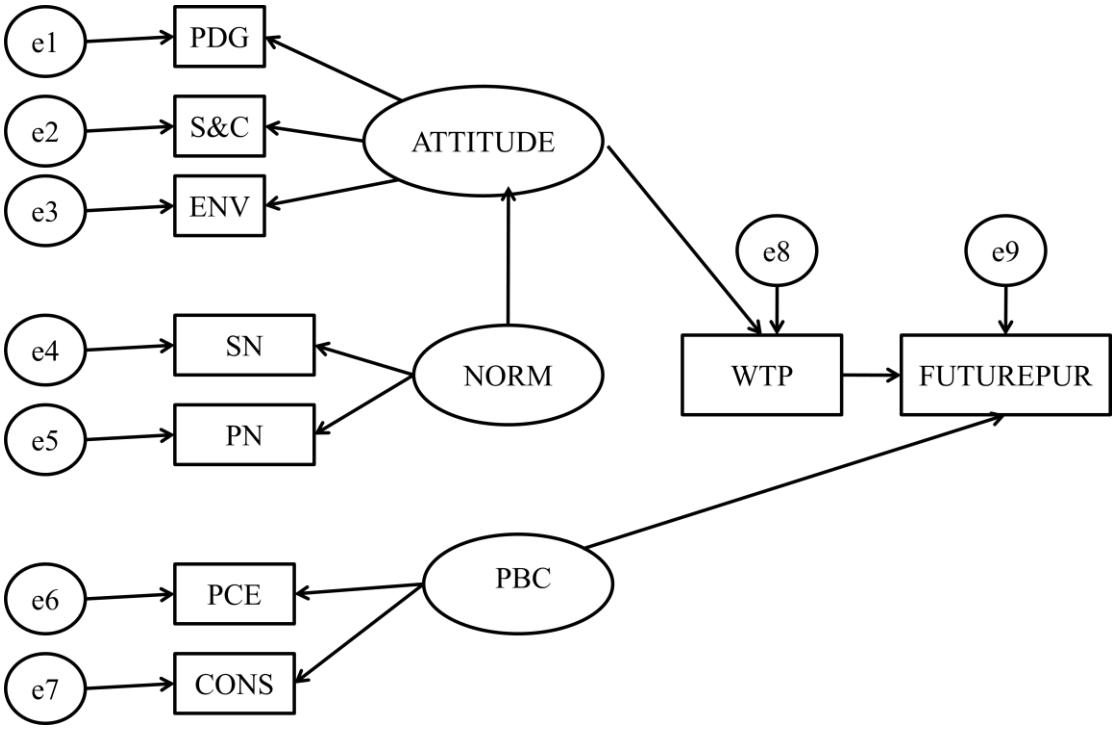

Figure 5.2 Revised Structural Path Diagram for the Local Food

Note: PDG: Personal Direct Gain; S&C: Society & Community Gain; ENV: Environmental Gain; SN: Social Norm; PN: Personal Norm; PCE: Perceived Consumer Effectiveness; PBC: Perceived Behavior Control; WTP: Willingness to Pay; FUTUREPUR: Future Purchase Behavior

In accordance with the revised models, the hypotheses discussed in Chapter 4 were modified as follows:

H_1: A positive attitude towards organic (or local) food is likely to increase consumers' WTP for organic (or local) food (positive effect).

H_2: Perceived behavioral control is likely to decrease the performance of purchase behavior for organic and local food (negative effect).

H_3: A stronger WTP is likely to increase the possibility and frequency for future purchase behavior (positive effect).

H_4: A positive norm would have positive effect on attitude (positive effect).

The results of model estimation are reported in Table 5.7 and Table 5.8 respectively for organic and local model.

Table 5.7 Parameter Estimates and Goodness-of-fit Statistics, Organic, Final

Standardized Path Estimates			
WTP	←	ATTITUDE	0.2692**
ACTPUR	←	WTP	0.2470**
ACTPUR	←	PBC	-0.3464***
ATTITUDE	←	NORM	0.7963***
ATTITUDE	←	PDG	0.8910***
ATTITUDE	←	C&E	0.8037***
NORM	←	SOCIAL IDENTITY	0.9664***
NORM	←	SN&PN	0.7622***
PBC	←	CONS	0.8957***
PBC	←	PCE	0.7492***

Goodness-of-Fit (with benchmark)	**Fit Statistics**
χ2/DF (1-4)	1.6576
GFI (>0.90)	0.9549
AGFI (>0.80)	0.8918
NFI (>0.90)	0.9462
CFI (>0.90)	0.9773
NNFI (>0.90)	0.9576
RMSEA (<0.08)	0.0720

Note: * significant at p<0.05; ** significant at p<0.01; *** significant at p<0.001

The final model for organic food achieved a significant improvement in terms of model fit compared with the original model, as all suggested levels were met (χ2/DF=1.66, GFI=0.95, AGFI=0.90, NFI=0.95, CFI=0.98, NNFI=0.96, RMSEA=0.07). All of the standardized path coefficients were significant (p<0.01) in the predicted direction.

For the organic model, perceived behavioral control appeared to have a strong negative effect (-0.3464***) on purchase behavior while WTP had a significant albeit slightly weaker direct positive effect (0.2470**) on purchase. These results were supportive for hypothesis H_2 and H_3, indicating consistency

with the TPB theory which considers behavioral intention as an antecedent of behavior and PBC as an independent predictor of behavior as well.

In terms of determinants for WTP, attitude had a strong and significant positive effect on willingness to pay (0.2692**), suggesting an evidence supporting hypothesis H_1. Norm had a significant direct positive effect on attitude (0.7963***) which was consistent with hypothesis H_4. Norm was proved to have direct positive impact on attitude and indirect impact on WTP through attitude.

Table 5.8 Parameter Estimates and Goodness-of-fit Statistics, Local, Final

Standardized Path Estimates			
WTP	←	ATTITUDE	0.1650*
ACTPUR	←	WTP	0.0438
ACTPUR	←	PBC	-0.1658*
ATTITUDE	←	NORM	0.8195**
ATTITUDE	←	PDG	0.7964***
ATTITUDE	←	S&C	0.8134***
ATTITUDE	←	ENV	0.8953***
NORM	←	SN	0.8365**
NORM	←	PN	0.8440***
PBC	←	PCE	0.9211**
PBC	←	CONS	0.7199***

Goodness-of-Fit (with benchmark)	**Fit Statistics**
χ2/DF (1-4)	1.6791
GFI (>0.90)	0.9442
AGFI (>0.80)	0.8744
NFI (>0.90)	0.9339
CFI (>0.90)	0.9712
NNFI (>0.90)	0.9482
RMSEA (<0.08)	0.0731

Note: * significant at p<0.1; ** significant at p<0.01; *** significant at p<0.001

Similarly, for the local food model, all the benchmarked levels were met (χ2/DF=1.68, GFI=0.94, AGFI=0.87, NFI=0.93, CFI=0.97, NNFI=0.95, RMSEA=0.07) and therefore also showed a good model fit. All expected effects were significant, with the exception of the effect of WTP on purchase behavior.

For the local model, norm still showed a significant role in predicting attitude (0.8195**) which was in support of H_4. Attitude was found to exert positive effect on WTP (0.1650*) while PBC was found to exert negative effect on WTP (-0.1658*). Therefore, the hypotheses H_1 and H_2 which proposed that consumers' WTP would be positively affected by attitude and negatively affected by PBC was supported. However, the path coefficient of the relationship between WTP and purchase behavior was not significant (0.0438). Therefore, hypothesis H_3 was not supported by the data of local food.

5.4 Comparison between Models

Based on the previous findings, the revised structural models were retained and applied to different types of food. The TPB models for tomatoes, beef and milk were compared to test their predictive power and efficiency. Tomato, beef, and milk were chosen because they each reflect fresh, meat and dairy respectively. The comparison was performed by replicating the model retained from egg data to both organic and local version of tomato, beef, and milk. The results of the estimates of the causal path coefficients are summarized in Table 5.9.

Table 5.9 Comparison of Parameter Estimates Between Different Kinds of Organic and Local Food

Path			Standardized Path Estimates							
			Egg		Tomato		Beef		Milk	
			Organic	Local	Organic	Local	Organic	Local	Organic	Local
WTP	←	ATTITUDE	0.2692***	0.1650*	0.1921**	0.0283	0.0353	0.0262	0.0886	0.0495
ACTPUR	←	WTP	0.2470***	0.0438	0.0492	0.0371	0.1479*	0.1234**	0.2088***	0.1860**
ACTPUR	←	PBC	-0.3464****	-0.1658*	-0.8432***	-0.1013	-0.2731***	-0.3071****	-0.4227****	-0.2695****
ATTITUDE	←	NORM	0.7963****	0.8195***	0.7935****	0.8150****	0.7929****	0.7956****	0.7937****	0.7966****

Note: * significant at p<0.1;** significant at p<0.05; *** significant at p<0.01; **** significant at p<0.001

First, for all the models, norms showed a strong positive direct effect on attitude, indicating a strong support for hypothesis H_4. This means a consumer who perceives more normative obligation to purchase organic and local food tends to have more positive attitudes towards them. The coefficients in the local models seem to be slightly higher than those in the organic models, indicating that consumers with same level of norms tend to have more positive attitudes towards local food.

Attitude displayed a significant positive effect on WTP only in three out of eight models, which were organic and local models of egg and organic model of tomato. Hypothesis H_1 was partially supported, suggesting that attitude was not a consistent predictor in different models.

In addition, hypothesis H_2 was primarily supported by the results that there was significant negative relationship between PBC and purchase behavior for all the models with one exception for local tomatoes.

Hypothesis H_3, that a stronger WTP is likely to increase the possibility and frequency for future purchase behavior, was generally supported. WTP showed significant positive effects on purchase behavior related to eggs, beef, and milk, but not tomatoes.

Chapter 6

DISCUSSION

The general aim of the thesis was to explore and integrate latent determinants influencing consumers' intention and purchase behavior for organic and local food into a quantitative TPB framework, and to contribute to the understanding of the nature of the relationships between the latent factors and between the manifest variables that measure those latent factors. Specifically, the focus was on testing the relationship between psychological factors (attitude, norm, PBC) and consumers' WTP and purchase behavior for organic and local food in the context of the TPB model. Furthermore, the effectiveness of TPB model was tested by comparing the TPB models for different types of organic and local food in the US market.

The first objective of this study was to explore and evaluate factors that measure consumers' psychological aspects such as attitude, norm, and perceived behavioral control. The findings from the explorative factor analysis supported previous studies in that this study also confirmed the important role of consumers' concerns over quality, health and environmental issues in determining their attitudes towards organic and local food. The importance of personal normative belief was highlighted as significant determinants of norm. This is a constructive addition to the literature in that many previous researches had overlooked this factor by only focusing on subjective normative belief.

The second goal of this study was to test the hypotheses of relationships between the components of the TPB model. The specific focus was on testing the

validity and usefulness of the TPB model in explaining the empirical experimental data on organic and local egg. The present study validated a model that predicted the WTP and purchase behavior of organic food among US consumers. For organic food, consistent with the TPB, attitude and norm were found to exert significant direct or indirect positive effect on WTP, which positively affected consumers' future purchase. Results also showed that PBC had a significant independent negative effect on purchase behavior, which supported the argument by Ajzen (1991) that stated the need for a direct relationship between PBC and behavior.

In contrast, the TPB model for local food was partially supported by the empirical data of local egg. Specifically, the estimates of free parameters showed that consumers with more positive attitude and positive norm tended to have a strong WTP. Besides, consumers with lower PBC showed an expected tendency to increase future purchase. However, contrary to the TPB model, a stronger WTP did not seem to increase the possibility and frequency for future purchase behavior of local food. This raised the question on how to explain the difference between the model performance of organic and local food.

Finally, the third objective was to test the effectiveness of the TPB by comparing models for different kinds of food products in organic and local version. The overall structural model was tested across different types of organic and local food and the comparison between eight models generally supported the explanatory power of the TPB. Yet, if we focus on the influence of each construct on WTP and purchase behavior, the strength of the links between the variables varied between different food types. Most noteworthy difference findings were discussed as follows.

Norm showed constant significant positive effect on attitude throughout the eight models. This finding supported Ajzen and Fishbein (1980) that all moral or normative influences are assumed to be mediated via the measures of attitudes or/and subjective norms. Results showed that effects of norms on attitudes were larger for local food than for organic one, suggesting that positive normative beliefs contributed more to attitudes towards local food than to attitudes towards organic food.

Attitude was one latent variable that did not perform very well in all of the models, with significance in only three models. While positive attitude could still be possible indicator of WTP, these results might suggest that there existed no general attitudinal beliefs that can be applied to different categories of food. Consumers may attach different beliefs to various kind of food because of different attributes associated to the food products.

PBC generally showed a negative direct effect on purchase behavior for different kinds of food. This finding supported the argument made by Ajzen (1985) that PBC represents people's actual control or lack of control over the behavior which can disrupt the intention-behavior relation.

WTP was another inconsistent predictor in the TPB model. For example in this study strong intention for organic tomato was not followed by more purchase behavior. The existence of intention-behavior gap has been presented in consumer behavior literature (Vermeir and Verbeke, 2006; Sutton, 1998; Claudy et al., 2013) and the gap in tomato models might be bridged by different variables that mediated impact of consumers' psychological variables on behavior.

Together, this study showed that the TPB model offered a useful and effective framework to identify consumer's attitude, norms and perceived behavioral control

which motivated the willingness to pay and actual purchase behavior. However, more work was needed. Results suggested that a further examination of TPB might be beneficial in understanding WTP for different kinds of food.

Besides the difference in the influences of each construct, it can also been seen that in general, the model performed better in explaining the purchase intentions and behaviors for organic food than those for local food. For example, WTP for organic food exerted a significant positive impact on purchase behavior; however, for local food WTP did not seem to be an important factor in explaining purchase behavior. There are several possible reasons that might explain the difference.

First of all, this phenomenon might be due to the vagueness of definitions of "local food". while organic food has been widely accepted and considered as being produced differently from those grown by conventional farming method and has been perceived as healthy and sustainably good to the environment, local food, on the other hand, does not have a firm definition. Consumer still have different understanding on what exactly "local food" is. Therefore, compared to organic food, local food is still in its introduction stage which results in low familiarity among general group of consumers. Food neophobia, which was first introduced by Pliner and Hobden (1992), is a term which defines the phenomenon that consumers are reluctant to try novel or "unfamiliar" food. That is, a consumer with higher food neophobia personality will have the tendency to avoid novel and "unfamiliar" foods (Tuorila et al., 2001). In the context of this study, local food is not as widely prevalent as organic food is in the US and thus is the relatively more "unfamiliar" version to consumers. Therefore, consumers might be reluctant to buy local food although they have general positive attitude towards it. This indicates the need for more information, regulation and

labeling system for local food. Findings of negative relationship between food neophobia scale and food intake motives or self-reported food choice can also been demonstrated by several studies (Eertmans et al., 2005; Chen, 2007; Hursti and Sjoden, 1997; Tuorila et al., 2001).

In addition to the ambiguity of the definition of local food, this phenomenon might be due to social dilemma which refers to situations where people acting like a group end up doing less well than what they should have done if they had acted rationally and reasonably. The similar outcomes from social dilemma have also been discussed in terms of free-riding problem, the prisoner dilemma, the public-good problem, and the tragedy of the commons. Liebrand and Messick (1996) have argued that the framework of social dilemma can explain the dynamics and flexibility of real-world situations better than the traditional framework based on the rational decision making theory. Jansson (2009) argues that social dilemma should be one explanation for people not purchasing organic food because consumers are mutually dependent on others to make the right choice to get a good outcome.

In the context of local food, as can be seen in the discussion in chapter four, consumers perceive more social and community benefit from purchasing local food than organic food, such as developing personal relationship with farmers, and supporting rural economy. It is likely that while each consumer values social and community as well as environmental gains which are brought by consuming local food, it is more individually profitable to maximize self-interests by not purchasing local food. That is, although each member of consumer group has incentive to buy local food as they believe it can bring social benefits, the situation is that it is disadvantageous for each consumer to make a contribution. This can be demonstrated

by the two items under the scale of perceived consumer effectiveness in the local food TPB model: “No matter what I buy, I can't influence the food system by myself” and “No matter what I buy, I can't have an influence on the environment by myself”. For example, if consumers believe that the social and environmental benefits from purchasing local food are long-term gains that require enough participants and involve uncertainties, then they probably act in short-term self-interest and will not spend extra money or time purchasing local food, even if they have intentions for it.

Another possible explanation for this phenomenon involves choice editing, which is a relatively new notion in behavioral economics on shaping behavioral choices or “steering consumer behavior” (Thaler and Sunstein, 2008). Study by Reisch and Bietz (2011) has shown that consumer behavior depends much more on the stimuli and barriers in the immediate choice contexts. Power and Mont (2012) did a meta-analysis of studies on sustainable consumption and argued that the change of default choice towards sustainable consumption played an important role in inducing change in consumption pattern. In another word, the choice set can effectively influence the choice made by consumers. Therefore when it comes to purchasing local food, the establishment of organic food as the default choice for healthy and environmental-friendly food might result in consumers favoring more for organic than for local food.

Finally, the problem of provisional intentions might also shed light on the non-significance of intention-behavior relationship for local food. Sutton (1998) stated that many participants in the application of the TPB were not engaging in real decision making while they were filling out the questionnaire. Therefore their intentions expressed were merely hypothetical or provisional. If WTP is measured after the real

decision has been made, we can expect to find a stronger relationship between intention and behavior. This problem can explain the low predictive power of WTP in local models; however, it cannot explain why it occurred only to the local model as this problem would also be present in the model of organic food. Therefore a deeper exploration is in need for understanding the difference between organic and local food when opposed to such problem.

This study differs from the previous ones in that the concept of subjective norms in the original TPB model was enhanced by incorporating personal norms which measured the individual's internal self-identity and self-rewarding feelings. In this regards, norms reflected both internal self-concept and perceived external social pressure, and thus could be re-conceptualized as moral attitudes and were modeled to influence consumer's WTP through attitudes.

Opinion in existing studies differ in discussing whether the influences of moral norms are mediated through attitudes or/and subjective norms (Conner and Armitage, 1998; Raats et al., 1995). This study suggests that moral norms are mediated through attitudes because of the high correlations between these variables. Besides, it has been argued whether moral norms improved the prediction of intention (Sparks and Shepherd, 2002) or the prediction of attitudes (Raats et al., 1995). Our results support the finding of Ratts et al. (1995) by suggesting that moral attitudes were mediated through attitudes and influenced intentions indirectly. This study also supports the finding of Thogersen (2012) which modeled moral attitude as a measure under the overall attitude concept instead of modeling it to be a separate part. In sum, this study provides justification for incorporating moral and attitudinal dimensions into the TPB model for organic and local food by indicating that consumers consider purchasing

organic and local food as a morally right thing to do, and such feelings further lead to intentions to consume.

The main limitation of this study comes from the use of self-reported methods. The self-reported measure of behavior rather than an observed one is a common weakness found in TPB-related studies. Armitage and Conner (2001) had demonstrated that variance was accounted larger in self-reported behavior by the TPB variables than in observed behavior. Besides, it has also been found by Davies et al. (2002) that compared to self-reported behavior, observed behavior had weaker connection with behavioral intentions. Therefore, it should be noted that the relationships between some variables might be inflated; the measures of attitudes, norms and PBC used in the current TPB model probably have less strong predictive power for actual purchase than for self-reported behavior which was applied in the present study.

Another limitation of this study was that we ruled out the factor of perceived availability because of scale reliability in the data. Perceived availability, which represents consumers' perceived external barriers such as perceived cost and accessibility, has been demonstrated by many studies to be one of the important variables which have strong explanative power (Vermeir and Verbeke, 2006; Verbeke and Vermeir, 2008; Sparks and Shepherd, 1992; Nurse et al., 2010). Besides, price, information access, store availability, convenience have been widely considered as important factors influencing consumers' preference for organic and local food. Therefore, future study may focus on incorporating the factor of perceived availability into the TPB model as part of the PBC concept, or including it as a separate concept the effect of which is mediated through intention.

Chapter 7

CONCLUSION

This study lends moderate support for the usefulness and applicability of incorporating measures from the framework of TPB into understanding and predicting consumers' WTP and purchase behavior for organic and local food. Attitude, moral attitude which reflects social and personal norm, as well as perceived behavioral control, all seem to have significant predictive power for intentions and behaviors for organic and local food. As this study has shown, in general, individuals who have more positive attitudes, greater norms, and lower perceived behavioral control tend to have stronger intentions and more frequent purchase behavior for organic and local food.

This study contributes to the existing body of research in the following aspects. Firstly, this study integrates factors that influence consumers' intention and purchase for organic and local food into a coherent and quantitative model, which contributes to the existing studies most of which simply list possible influences rather than offering framework for empirical research and practical application. Secondly, this study does not only discuss the basic three components (attitude, norm, and PBC) of the TPB, but also offers a useful extension of the basic model by including moral dimensions such as personal norm and self-identity, which provide a clearer understanding of the normative factors that influence consumer choice of organic and local food.

From a practical point of view, findings from this study provide some insights for marketing campaigns and public policy interventions on promoting organic and

local food sales. The negative correlations between PBC and purchase behavior for both organic and local versions demonstrate that consumers' perceived control beliefs may need to be lowered in order to attract more purchase. Producers and marketing departments may focus on convincing consumers about attitudinal beliefs and normative beliefs that shape their attitude towards organic and local food. These beliefs include consumers' concern for health and environment, as well as their beliefs on moral rightness to consume organic and local food. At the same time, producers, marketers, as well as policy makers who want to promote organic and local markets may also spread confidence on organic and local farming, and extend consumers' beliefs on their effectiveness in changing food system and environment by the purchase of organic and local food. A success in these directions may contribute to increasing consumers' intention and purchase for organic and local food.

Future work will aim to explore other mediating factors between the present psychological constructs and WTP for organic and local food. Likewise, the relationship between consumers' WTP and purchase behavior also needs to be further investigated especially for local food. That is, future work may focus on identifying other factors that mediate the impact of intention on behavior. In addition, the findings from this study need to be validated and compared with similar studies based on a larger geographic distribution and population in order to enhance the generalization.

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Appendix A

SURVEY

Q.1 Please rate your agreement with the following statements

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I enjoy cooking	❍	❍	❍	❍	❍	❍	❍
I like to try new foods	❍	❍	❍	❍	❍	❍	❍
I like shopping for food or cooking supplies	❍	❍	❍	❍	❍	❍	❍
I think I have a very healthy diet	❍	❍	❍	❍	❍	❍	❍
Food quality is more important than price	❍	❍	❍	❍	❍	❍	❍
I am loyal to my favorite brand foods	❍	❍	❍	❍	❍	❍	❍
When I travel, I enjoy trying area specialties	❍	❍	❍	❍	❍	❍	❍
I don't have the time to eat or cook like I'd like to	❍	❍	❍	❍	❍	❍	❍
I rarely talk about food	❍	❍	❍	❍	❍	❍	❍

Q.2 Please rate your agreement with the following statements

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I grow a lot of my food in my garden	❍	❍	❍	❍	❍	❍	❍
My family and friends turn to me for advice on foods and cooking	❍	❍	❍	❍	❍	❍	❍
I prefer 'comfort food' to trendy food	❍	❍	❍	❍	❍	❍	❍
I eat out a lot	❍	❍	❍	❍	❍	❍	❍
The latest food and cooking trends matter to me	❍	❍	❍	❍	❍	❍	❍
I like to watch food and cooking shows	❍	❍	❍	❍	❍	❍	❍
I eat mainly just to satisfy my hunger	❍	❍	❍	❍	❍	❍	❍
I like to try new recipes	❍	❍	❍	❍	❍	❍	❍

Q.3 What is your gender?

- ❍ Male
- ❍ Female

Q.4 What is your age?

Q.5 What is your ethnicity?

- ❍ White, not of Hispanic origin
- ❍ Black or African American
- ❍ Hispanic or Latino
- ❍ American Indian or Alaskan Native
- ❍ Asian
- ❍ Other (please specify)

  _____

Q.6 What is your total household income?

- ❍ Less than $10,000
- ❍ $10,000 to $14,999
- ❍ $15,000 to $24,999
- ❍ $25,000 to $34,999
- ❍ $35,000 to $49,999
- ❍ $50,000 to $74,999
- ❍ $75,000 to $99,999
- ❍ $100,000 to $149,999
- ❍ $150,000 to $199,999
- ❍ $200,000 or more

Q.7 What is your highest education you have completed?

- ❍ Less than High School
- ❍ High School
- ❍ Some College
- ❍ College
- ❍ Post Graduate

Q.8 What state do you live in?

- ❍ DE
- ❍ MD
- ❍ NJ
- ❍ PA
- ❍ Other

Q.9 Are you the primary shopper in your household?

- ❍ Yes
- ❍ No

Q.10 Do you have children under 18 in your household?

- ❍ Yes
- ❍ No

Q.11 Please enter your bid for each of the following versions of an 18 oz jar of strawberry preserves

	Bids
Conventional	
Organic	
Locally Grown	
Organic and Local	

Q.12 Please enter your bids for each of the following versions of 5 ears of sweet corn

	Bids
Conventional	
Organic	
Locally Grown	
Organic and Local	

Q.13 When you are purchasing food, how important is it to you that you are:

	Very Unimportant	Unimportant	Somewhat Unimportant	Neutral	Somewhat Important	Important	Very Important
Obtaining fresher food	❍	❍	❍	❍	❍	❍	❍
Purchasing better tasting food	❍	❍	❍	❍	❍	❍	❍
Improving my health and the health of my family	❍	❍	❍	❍	❍	❍	❍
Supporting small family farms	❍	❍	❍	❍	❍	❍	❍
Improving animal welfare	❍	❍	❍	❍	❍	❍	❍
Reducing gasoline consumption due to transportation (lower food miles)	❍	❍	❍	❍	❍	❍	❍
Supporting the rural community	❍	❍	❍	❍	❍	❍	❍
Purchasing safer food	❍	❍	❍	❍	❍	❍	❍
Developing personal relationship with farmers	❍	❍	❍	❍	❍	❍	❍
Getting better quality food	❍	❍	❍	❍	❍	❍	❍
Benefiting the environment	❍	❍	❍	❍	❍	❍	❍
Supporting sustainable farming practices	❍	❍	❍	❍	❍	❍	❍

Able to tell where the food is from	❍	❍	❍	❍	❍	❍	❍

Q.14 Please rate your agreement with the following statements.

If I purchase local food, I will be:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Obtaining fresher food	❍	❍	❍	❍	❍	❍	❍
Purchasing better tasting food	❍	❍	❍	❍	❍	❍	❍
Improving my health and the health of my family	❍	❍	❍	❍	❍	❍	❍
Supporting small family farms	❍	❍	❍	❍	❍	❍	❍
Improving animal welfare	❍	❍	❍	❍	❍	❍	❍
Reducing gasoline consumption due to transportation (lower food miles)	❍	❍	❍	❍	❍	❍	❍
Supporting the rural community	❍	❍	❍	❍	❍	❍	❍
Getting better quality food	❍	❍	❍	❍	❍	❍	❍
Purchasing safer food	❍	❍	❍	❍	❍	❍	❍
Developing personal relationship with farmers	❍	❍	❍	❍	❍	❍	❍
Supporting sustainable farming practices	❍	❍	❍	❍	❍	❍	❍
Able to tell	❍	❍	❍	❍	❍	❍	❍

where the food is from							
Benefiting the environment	❍	❍	❍	❍	❍	❍	❍

Q.15 Please rate your agreement with the following statements.

If I purchase organic food, I will be:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Purchasing better tasting food	❍	❍	❍	❍	❍	❍	❍
Improving my health and the health of my family	❍	❍	❍	❍	❍	❍	❍
Improving animal welfare	❍	❍	❍	❍	❍	❍	❍
Getting better quality food	❍	❍	❍	❍	❍	❍	❍
Purchasing safer food	❍	❍	❍	❍	❍	❍	❍
Benefitting the environment	❍	❍	❍	❍	❍	❍	❍
Supporting small family farms	❍	❍	❍	❍	❍	❍	❍
Supporting sustainable farming practices	❍	❍	❍	❍	❍	❍	❍

Q.16 Buying organic food is:

	1	2	3	4	5	6	7
Bad:Good	❍	❍	❍	❍	❍	❍	❍
Foolish:Wise	❍	❍	❍	❍	❍	❍	❍

Q.17 Buying local food is:

	1	2	3	4	5	6	7
Bad:Good	❍	❍	❍	❍	❍	❍	❍
Foolish:Wise	❍	❍	❍	❍	❍	❍	❍

Q.18 Please rate your agreement with the following statements

	Strongly Disagree	Disagree	Somewhat Diagree	Neutural	Somewhat Agree	Agree	Strongly Agree
I consider myself a typical buyer of local food	❍	❍	❍	❍	❍	❍	❍
If I wanted to, it would be easy to purchase organic food	❍	❍	❍	❍	❍	❍	❍
I will look for organic food next time I go food shopping	❍	❍	❍	❍	❍	❍	❍
I tend to do what people who are important to me think I should do	❍	❍	❍	❍	❍	❍	❍
I felt I ought to bid more for organic food	❍	❍	❍	❍	❍	❍	❍
I consider myself a typical buyer of organic food	❍	❍	❍	❍	❍	❍	❍
I consider myself a green consumer	❍	❍	❍	❍	❍	❍	❍

I think of myself as a health conscious consumer	❍	❍	❍	❍	❍	❍	❍
I felt I ought to bid more for local food	❍	❍	❍	❍	❍	❍	❍

Q.19 Please rate your agreement with the following statements

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Organic food is a fad	❍	❍	❍	❍	❍	❍	❍
Local food is a fad	❍	❍	❍	❍	❍	❍	❍
You can't feed the world with organic food	❍	❍	❍	❍	❍	❍	❍
Conventional farming practices are the most efficient	❍	❍	❍	❍	❍	❍	❍
There is nothing wrong with conventional farming practices	❍	❍	❍	❍	❍	❍	❍
Regions should specialize in producing foods they are best at	❍	❍	❍	❍	❍	❍	❍
No matter what I buy, I can't have an influence on the environment by myself	❍	❍	❍	❍	❍	❍	❍
No matter what I buy, I can't influence the food system by myself	❍	❍	❍	❍	❍	❍	❍

Q.20 Please rate your agreement with the following statements

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Most people who are important to me think I should purchase local food	❍	❍	❍	❍	❍	❍	❍
Most people who are important to me think I should purchase organic food	❍	❍	❍	❍	❍	❍	❍
I feel that I have an ethical obligation to purchase local food	❍	❍	❍	❍	❍	❍	❍
If I wanted to, it would be easy to purchase local food	❍	❍	❍	❍	❍	❍	❍
I will look for locally grown food next time I go food shopping	❍	❍	❍	❍	❍	❍	❍
I feel that I have an ethical obligation	❍	❍	❍	❍	❍	❍	❍

to purchase organic food							
Buying organic food makes me feel like a better person	❍	❍	❍	❍	❍	❍	❍
Buying local food makes me feel like a better person	❍	❍	❍	❍	❍	❍	❍

Q.21 Please rate your agreement with the following statements

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Local food is too expensive	❍	❍	❍	❍	❍	❍	❍
It's difficult to find local food	❍	❍	❍	❍	❍	❍	❍
Organic food is too expensive	❍	❍	❍	❍	❍	❍	❍
It's difficult to find organic food	❍	❍	❍	❍	❍	❍	❍
Local food varies greatly in quality	❍	❍	❍	❍	❍	❍	❍
Organic food varies greatly in quality	❍	❍	❍	❍	❍	❍	❍
Food advertised as local isn't always really local	❍	❍	❍	❍	❍	❍	❍

Q.22 Future How often in the next two months do you intend to buy foods in each of the following categories?

	Not at all	Rarely	Occasionally	Often	Very often
Organic fresh produce	❍	❍	❍	❍	❍
Organic dairy products	❍	❍	❍	❍	❍
Organic meats	❍	❍	❍	❍	❍
Organic processed foods (e.g. bread, jam)	❍	❍	❍	❍	❍
Organic eggs	❍	❍	❍	❍	❍
Local fresh produce	❍	❍	❍	❍	❍
Local dairy products	❍	❍	❍	❍	❍
Local meats	❍	❍	❍	❍	❍
Local processed foods (e.g. bread, jam)	❍	❍	❍	❍	❍
Local eggs	❍	❍	❍	❍	❍

Appendix B

PERMISSION LETTER

Certification of Training
Human Subjects in Research

The University of Delaware certifies that Xinwei Chen
attended an institutional training session on the use of human subjects in research on

October 10, 2012.
(Date)

The session included the following topics:

- The Belmont Report
- Federal regulations for using humans in research (45 CFR 46)
- The University's Federalwide Assurance
- Informed consent
- Institutional procedures
- Sources for additional information.

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