Attitude, motivation, and consumption of seafood in Bacninh province, Vietnam

Master Thesis in International Fisheries Management
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By

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Summary

This study is one of the first attempts to investigate the attitude, motivation, and consumption of seafood among a group of consumers in Vietnam. The study applies the theory of planed behavior (TPB - Ajzen, 1991) for its conceptual framework, and adopts the measures from previous studies in developed countries. The study has two primary objectives. The first objective is to investigate the general patterns of the behavior, intention, attitudes, social norms, and perceived control, and other factors toward seafood consumption in Vietnam. It includes a further assessment to find out which product attributes significantly determine attitude and raise barriers toward eating fish. The second objective is to examine whether TPB and its construct measures are applicable to the Vietnam's situation. In order to achieve these objectives, the study employs the methods of descriptive analysis, test of reliability and mean difference, factor analysis, and structural equation modeling (SEM) to analyze the data collected in Bacninh, a Northern province of Vietnam.

The results show that fish as a meal is a common and broadly used food, and inhabitants in the area have high motivation and positive attitude toward consumption of the product. However, the consumers in Bacninh eat fish at a low frequency of once a week at home and several times a year away from home. Closer investigation reveals that quality, negative effects, and suitability have significant impact on attitude, while availability, suitability, and value are main determinants of personal control toward seafood consumption. Apart from bones and smell have negative effect on attitudes, all of these attributes have positive impact on attitude and perceived control. Time consumed to cook and prepare fish is not found as a significant indicator of attitudes as well as perceived control.

In academic aspects, the study confirms that TPB and the measures, which are used broadly in Western cultures, are suitable for seafood consumption studies in the Vietnamese context. Fish consumption frequency is significantly predicted and explained by intention and personal control; intention in turn is significantly determined by attitude and subjective norms, but not by personal control. The model of TPB explains for 17%

variance of the behavior and 39% variance of the intention of eating fish. A modified model results a significantly direct impact of attitude and norms on the behavior, but a non-significant effect of intention on the behavior. These results suggest that the fish consumption is under a weak volitional control and a habitual behavior. Product attribute beliefs explain for 58% variance of global attitude and 40% variance of global perceived control. A full TPB model that considers the impact of attribute beliefs on global attitude and perceived control is suggested for future research.

Almost of all measures used in the studies appear reliable to represent the constructs in question and applicable to Vietnamese context. Some measures should be improved in order to represent better the concepts. Intention that is measured within time interval of next three days appears not very compatible with the consumption frequency. The significantly high correlations between behavior and its predictors are an unexpected result.

This study also assesses the factors of habit, eating involvement, health consciousness, and knowledge by employing descriptive analysis, and test of reliability and mean difference. These constructs are highly reliable and appear significant so that they should be involved as additional components for the TPB in future studies.

Key words: Seafood, fish consumption, attitude, intention, TPB, Bacninh, Vietnam

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1. Introduction

1.1. Background

Vietnam has significant potential for fisheries development. Advantages in natural conditions and population have led to fisheries becoming a key industry in the early stages of the development's economy. The industry has contributed approximately 10% of total export value and created 3.4 millions jobs every year.

Although the export orientation in the strategy of sector development has contributed significantly in the pre-lift stage of the country, domestic markets also promise many potential advantages. The population of Vietnam has been recently estimated at 85 millions, which has created a huge market for every sector. A significant increase of average income per year has driven eating preferences toward more healthy food types that are expected from fish and seafood products. In addition, the growing market of tourism also has high demand for fresh, good quality and healthy products.

The development of home markets for seafood will bring many benefits in terms of both economic and social aspects. For example, if a retail market chain supplying high quality seafood items was established, it could not only meet demands for hygiene and healthy eating of consumers, but also benefit the small-scale fish farmers who would receive the highest price through direct supply. Moreover, the export orientation strategy has faced many challenges and barriers from global competition since it is dependent upon a limited number of markets. The domestic market, thus, could be an alternative choice that reduces risks particularly for small firms.

The fact that Vietnam joined WTO in 2007, means that the county has accepted more challenges and risks. Investment in the home market could be a wise strategy if the local industry wish to avoid difficulties and sufferings associated with global competition. However, seafood consumption behavior in Vietnam has not been thoroughly investigated. Understanding consumer's preferences and trends is critical for both producers and government's policy-makers. This thesis is a one of first attempts to investigate the preferences and attitudes toward seafood consumption of Vietnamese people.

1.2. Research issue and questions

Food and seafood consumption behavior is influenced by many interrelating factors of product attributes (flavor, texture, odor, quality, and convenience), person (personality, preference, attitudes, perception, knowledge), and cultural and social environment (availability, season, situation, culture) (Olsen, 2004; Furst *et al*, 1996; Shepherd, 1989; Yudkin, 1956). Several models were proposed to investigate the influences in form of theoretical frameworks (Khan, 1981; Randall, 1981; Shepherd, 1989; Furst *et al*, 1996). These approaches place emphasis on different aspects such as product sensory perception, quality evaluation, and economic, psychological or social aspects (Olsen, 2004).

In a consumer behavioral perspective, many different psychological models within different disciplines have been proposed to explain consumer's attitudes, motivation and consumption of fish or seafood. The most popular theoretical models applied in food and seafood consumption studies are probably the theory of reason action (TRA) and the theory of planned behavior (TPB) (Fishbein & Ajzen, 1975, 1980; Ajzen, 1991), behavioral perspective models Foxall (1990; 1999), and classical attitude-behavior models. The main advantage of these models is the inclusion of all person-, product-, and related-situation factors in explaining variations of seafood consumption frequency.

Generally, seafood consumption behavior is significantly determined by attitude, subjective norms and perceived behavioral control of individual toward the product (see Olsen 2004 for a review). Quality, nutrition, health, negative effects (bones and smell), convenience, availability, and price are main seafood attributes determining the consumption (Olsen, 2004). However, these conclusions come mainly from the studies in developed countries and Western cultures, whereas preference and food choice are various across situations and cultures (Furst *et al*, 1996; Sheppherd, 1989; Leek *et al*, 2000).

Since it's the first attempt, this study has two primary objectives. The first objective is to investigate the general patterns of the behavior, attitudes and motivation toward seafood consumption of the consumers in Vietnam. It includes a further assessment to find out which product attributes significantly determine attitude and raise barriers toward eating fish. The study uses the theory of planned behavior (Ajzen, 1991) as a conceptual framework. The measures designed to assess the model's constructs in the study are mainly from prior studies in Western context. The second objective is in term of academic

implications. The study purposes to examine whether TPB and its construct measures are applicable to Vietnam's situation.

More specifically, the thesis will be limited in aspects of research issues with the main questions being answered is:

(1) How are consumers' attitudes/preference, intention and consumption of seafood?
(2) How are consumers' norms and barriers toward seafood consumption?
(3) What are the main drivers/antecedents of seafood consumption behavior?
(4) Which product attributes are important in forming the general evaluation (attitude) and barrier (perceived control) toward the seafood consumption?

The two first issues deal with descriptive and factor analysis to investigate the patterns of global components within TPB and product attribute beliefs that are assumed to be important for the behavior and its predictors. The study also investigates whether there are differences in behavior, attitudes, norms, personal control, and product attribute beliefs between groups of consumers based on age, income, sex, area, family size, ect.

The two last questions deal with advanced analyses to figure out the causal relationships between the components conceptualized by TPB. According to TPB, an individual behavior is driven by his behavioral intention and perceived behavioral control (PBC). Behavioral intentions in turn are determined by their attitudes toward the behavior, subjective norms, and perceived control. Attitudes, norms and control within TPB can be assessed though indirect or direct measures (Ajzen, 1991). Indirect approach is achieved by beliefs strength and its subjective evaluation, so called as sumative belief model, while direct approach is performed in term of direction and formation of the beliefs. The study will apply the direct approach to assess the components, and two causal models being estimated are the basic model as proposed by TPB (Ajzen, 1991), and a beliefs model that refers to product attributes. Reliability tests of the measures and estimation of causal models will answer the last two questions and achieve the academic objectives.

The study also assesses some other constructs that are suggested as important in food and seafood studies. The other constructs such as habit, eating involvement, health consciousness, and knowledge are assumed to be important in understanding seafood consumption behaviour (Olsen, 2004). Thus, this study performs a descriptive analysis of

these constructs, as well as a test of their reliability and difference among demographic groups. The assessment of these constructs may be used for future and more representative studies of seafood consumption behavior in Vietnam

1.3. Methods

Data used in this thesis is from a survey that was performed in Bacninh, an inland province in the Northern of Vietnam. A convenience sample of 208 questionnaires was collected in August 2006. The first two issues will be performed by exploratory factor analysis, reliability test, and descriptive analysis. The advanced analyses for issues 3 and 4 are performed by structural equation modeling (SEM). The process of analysis will be supported by SPSS 14.0 and Amos 6.0.

1.4. Structure of thesis

Following the introduction, is Part 2 a discussion of theoretical and conceptual framework. Part 2 briefly introduce the theory of planned behavior, and then discuss aspects of the constructs within the framework, and other factors. Since this study is the first attempt, the theoretical part is placed an emphasis. Data and method in Part 3 focus on the measures, techniques for testing reliability and mean difference, factor analysis, and structural equation modeling. The Part 4 presents the results from data analysis and model establishments. The Part 5 discusses issues related to the results, conclusion and suggestions for future research.

2. Theoretical framework

Food preference and choice are influenced by many factors. Yudkin (1956) was probably the first investigator who listed the factors impact on food choice in three categories: physical (geography, season, economics, and food technology), social (religion, custom, social class, education, advertisement, and demographics), and physiological (heredity, allergy, therapeutic diets, acceptability, and nutritional need) factors. The classification of Yudkin reflects social, cultural, and physical aspects influencing the food preference and choice. However, it does not show how these factors might be related to each other or how their relative importance might be determined (Shepherd, 1989). Several investigators have tried to establish some models, which incorporate the factors that might influence food choice (Khan, 1981; Randall, 1981; Shepherd, 1989; Furst *et al*, 1996). In general, these models explain that food choice is influenced by food attributes, personal factors, and economic and social environments. Each model differs from others in the way it places the emphasis on these aspects.

In the psychological perspective, many empirical studies have combined these interrelated factors to explain the behavior toward food choice and intake. In food as well as seafood context, the theories which were most frequently applied are theory of reasoned action and the theory of planned behavior (Corner & Norman, 2002; Norman & Conner, 2006; Olsen, 2004, 2007; Spark *et al,*1995; Verplanken & Faes, 1999; Scholderer & Grunert, 2001; Saba & Vassallo, 2002; Kassem & Lee, 2004; Verbeke and Vackier, 2005); the model of buying behavior of food products (Acebron *et al*, 2000); behavioral perspective model (Leek *et al*, 2000), and classical attitude behavior model (Trondsen *et al*, 2003; 2004; Olsen *et al*, 2006). In general, these applications all showed that choice and motivation toward seafood consumption are driven by attitude toward the product, social pressure and expectation, and perceived behavioral controls over barriers and difficulties for the consumption. These findings are consistent with the conceptualization that theory reasoned action (TRA-Fishbein & Ajzen, 1975; 1980) and planned behavior (TPB-Ajzen, 1991) have recommended.

This study is a quantitative research in psychological perspective, in which TRA & TPB are used as conceptual framework. This section will discuss the aspects of the constructs within TRA & TPB, and includes other important factors, which are used as

extensions of these theories. Brief introduction of TRA & TPB is presented at beginning and hypotheses for causal relations tests are in the end of the section.

2.1. Theory of reasoned action and planned behavior

In the early days of psychological research, most investigators accepted an assumption that human behavior was guided by social attitudes. Therefore, almost all works so focused on exploring the attitude's structure and the measures to assess the constructs. However, by the late 1960s most studies reported the poor relationship between verbal attitudes and actual behavior (Campbell, 1963; Festinger, 1964; Wicker, 1969). Several researchers had called for the abandoning the attitude constructs and argued that new directions should be invested in (Wicker, 1969).

Investigations on the weak attitude-behavior relationship explored that most early studies failed on account of two types of inconsistencies in measurements of the constructs. The first type of inconsistency was the broad attitude versus single behavior, namely *evaluative inconsistency* (reviewed by Wicker, 1969). The second was that attitude sometime was measured as the "willingness" or "acceptability", which should have by right been viewed as behavioral intentions (Fishbein, 1975). The second inconsistency is known as *literal inconsistency*. Based on these findings, in the 1970s Fishbein & Ajzen argued that attitudes could be indicators of behavior if the constructs were compatible in measurement and the relationship between attitude and behavior must be mediated by a construct instead of a direct relation. The authors then proposed a model to predict the behavior through attitudes, namely the theory of reasoned action (Fishbein & Ajzen, 1975).

The critical assumption of TRA is that humans behave under their volitional control. A person will perform a given behavior according to his intention, attitude and beliefs about performance of the behavior. Intention is assumed as the best predictors of behavior. The stronger the intention to engage in the behavior, the more likely should be its performance. Intention is assumed as motivational factors influencing the behavior; it indicates the individual's willing and effort to perform the behavior (Ajzen 1991).

Intention in turn is determined by *attitude* toward behavior and *subjective norm* (SN) related to the behavior. These two determinants reflect the personal and

environmental factors. While personal factors reflect the positive or negative evaluation of individuals toward behavioral consequences, the environmental factors imply the person's perception of social pressures on him to perform or not perform the behavior in question (Fishbein 1975). The effects of attitude and subjective norm on intention vary across behavior, situation, and person.

Although many studies supported the TRA model (reviewed by Sheppard *et al*, 1988), numerous instances of criticism of the theory have emerged. The criticisms focus primarily on the sufficient description of attitude-behavior relationship that the model claims for. For example, several critics argued that intention determined by only attitudes and subjective norms are not sufficient. The other constructs like personal moral obligation, person self-efficacy, anticipated positive/negative feelings, and perceived controls over the behavior are also determinants of intention (Gollwitzer, 1993). Similarly, past behavior and habit, perception of resource and opportunities to execute the action probably determine the behavior in question (Triandis, 1980; Liska, 1984).

Ajzen (1987, 1991), therefore, revised the TRA on account of these criticisms by introducing an additional component of perceived behavioral control. The theory of planned behavior (TPB) was introduced as an extension of TRA. According to TPB, behavioral intention is something like a plan to achieve the behavior while PBC refers to abilities necessary for carrying out that plan. The link between intention and behavior reflects the fact that people tend to engage in behavior they intend to perform. The link between PBC and behavior is more complex: a direct relation or indirect relation mediating through intention. This relationship suggests that people are more likely to engage in (attractive/desirable) behaviors they have control over, conversely they are prevented from carrying out the behaviors over which they have no control. If the intentions are held constant, behavior will be more likely to be performed as PBC increases (Ajzen, 1991).

According to Ajzen (1991), the relative importance of attitude, SN and PBC in the prediction of intention and behavior is expected to vary across behavior and situation. For example, in situation where attitudes are strong and normative beliefs are powerful, the PBC may be less predictive of intention. This means, under completely volitional control, the intention-behavior relation should be optimal, and PBC should not exert any influence

on this relationship. In contrast, where the behavior is not under volitional control PBC should moderate the relationship of intention-behavior (Conner & Armitage, 1998).

Within conceptual framework of TRA, beliefs about a given behavior provide the basis for formation of intention toward performing the behavior. Beliefs refer to a person's subjective probability judgments concerning some discriminable aspects of his world; they deal with the person's perception of himself and his environment (Fishbein, 1975). Attitude, norms and perceived behavioral control are assumed to be driven by *behavioral beliefs, normative beliefs*, and *control beliefs*, respectively.

Behavioral beliefs guide the attitude of individual toward the objects. Attitudes represent a person's general feelings of favorableness or unfavorableness toward some stimulus object (Fishbein & Ajzen, 1975). When a person forms beliefs about an object, he automatically and simultaneously acquires an attitude toward that object. Each belief links the object to some attributes; the person's attitude toward the object is a function of his evaluations of these attributes. The *normative beliefs* are concerned with the likelihood that important referent individuals or groups approve or disapprove of performing a given behavior (Fishbein & Ajzen, 1975). Similarly, SN are determined by perceived expectations of specific referent individuals or groups and the person's motivation to comply with those expectations. The *control beliefs* that deal with the presence or absence of requisite resource and opportunities will increase or decrease the perceived difficulty of performing behavior in question (Ajzen, 1991). People who perceive that they have access to necessary resources and that there are the opportunities (lack of obstacles) to perform the behavior are likely to have a high degree of PBC. The more resources and opportunities individuals believe they possess, the fewer obstacles or impediments they anticipate, the greater should be their perceived control over the behavior (Ajzen, 1991).

Fishbein and Ajzen (1975, 2005) also mentioned the role of background factors. A multitude of variables related to social, economic, demographic factors and personal traits could potentially influence the beliefs people hold. The connection between background factors and behavioral, normative, and control beliefs are in indirect way, difficult to know and belong to an empirical question.

This study will test the causal relationships as proposed by TPB. A structure of the TPB model to be presented in the following is presented in Figure 2.1. In the figure there are some attribute beliefs assumed to be indicators of attitude and perceived behavioral control refer to only seafood product and the assumptions of the study. The framework is also presented as hypotheses for causal model tests.

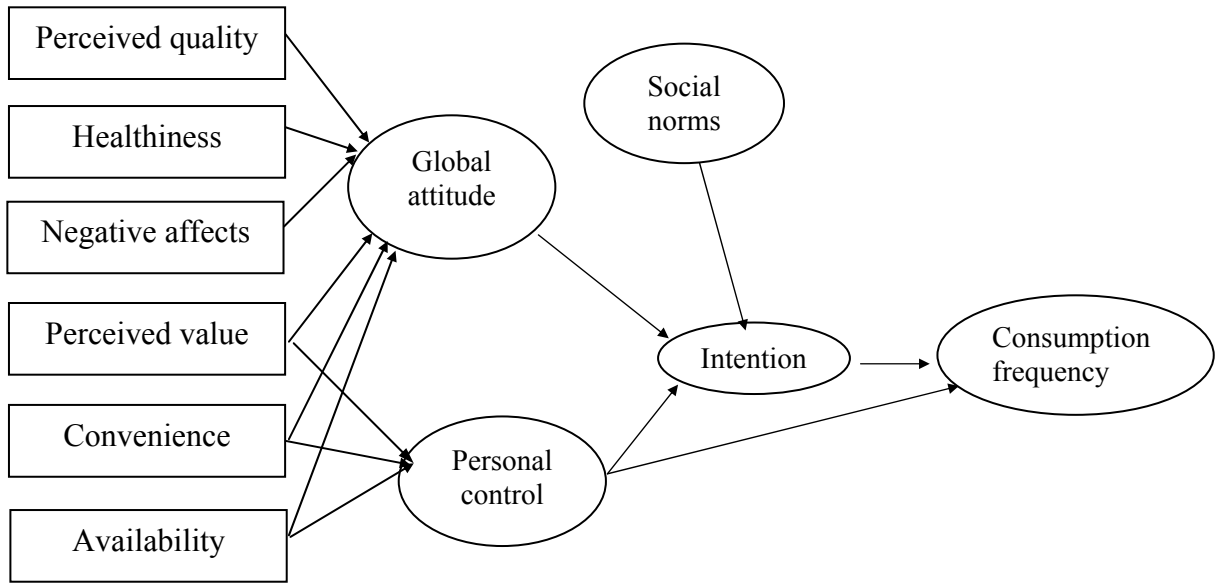

Figure 2.1. Conceptual framework

2.2.Consumption and behavior

According to Jaccard and Blanton (2005), human behavior is very diverse and can take many forms. Behavior may be implicit or explicit response. Behavior can be classified based on factors that are thought to influence the behavior and on the consequence of behavior. When considering behavior's determinants, the behaviors are distinguished in goal-directed behavior, unconscious or automated behavior, impulsive behavior, and volitional behavior. The definitions of behavior, therefore, are very diverse for different purposes. Jaccard and Blanton (2005) defined behavior as "any denotable overt action that an individual, a group of individuals, or some living system (e.g., a business, a town, and a nation) performs. An action has a denotable beginning and a denotable ending and is performed in an environmental context in which the individual or group is embedded" (pp.128). This definition is probably quoted most frequently in social science and marketing research.

Behaviors might be measured in forms of dichotomous (e. g., whether a person has eaten fish), discrete (e. g., how many times in the last year the person has eaten fish), and continuous scores (e. g., the amount of fish someone eats) (Jaccard & Blanton, 2005). The kind of behavioral scores chosen depends on the theories that are adapted. According to Jaccard and Blanton (2005), when theories are adapted to take into account the multiple attitudes that assumed to underlie the behavior, the quantitative and continuous scores are suited for behavior measure.

This study defines and measures behavior as an individual's frequency of fish consumption- as a self reported measure of past behavior. The study doesn't distinguish between actual and perceived behavior/frequency. A self-report of past behavior frequency is common in social studies (see Conner & Armitage, 1998 for a review) and also food and seafood consumption research (Raats *et al,* 1995; Shepherd & Raats, 1996; Myrland *at al,* 2000; Olsen 2001, 2005; Verbeke & Vackier, 2005).

According to TRA and TPB, a given behavior has four elements: (1) an action (e.g., buying or eating), (2) an object or target toward which the action is directed (e.g., a brand, product or person), (3) a context (e.g., in a supermarket, at home or in a restaurant), and (4) a time (e.g., on Monday, in the past 30 days or in coming weeks) (Fishbein & Ajzen, 1975; 1980). It is also suggested that behavior and its indicator's components must be corresponding to ensure a strong relationship. For example, specific attitudes must be matched against specific behavior and general attitudes must be matched against general behavior. The matching among those constructs with respect to the four elements is known as the *principle of compatibility* (Fishbein &Ajzen, 1980; 2005). It is expected that the prediction of model will be improved when the measures of components involve exactly the same action, target, context, and time elements, whether defined at a specific or general level. In this study, the behavior is considered at general level, without any specific target (species fish items), settings (eating fish at home or far from home), and time (at lunch or diner).

Within attitude theories, behaviors with respect to some attitude objects differ in the extent to which they reflect positive or negative attitude about the object. The more positive an individual feels about attitude object, the more likely it is that he or she will perform the behavior with respect to it, and vice verse. Therefore, any given behavior can

be scaled in terms of the degree of positivity or negativity it implies about the attitude object (Anderson, 1981). Behavioral scale values can be taken into account to construct a variety of models about the relationship between attitudes and behavior. The relationships might be in linear or curvilinear forms (Fishbein & Ajzen, 1975). The study is carried out under the assumption that behavior correlates linearly with attitude, which is a critical requirement for a causal model test (Hair *et al*, 1995). Under this assumption, respondents who evaluate fish as meal more positively are people who consume fish more frequently.

Most studies within the approach of TPB and TRA use a prospective design and measure behavioral responses days, weeks or months after they have measured attitudes and intentions (Ajzen, 1991). However, according to TRA and TPB, if all factors (internal, external, and individual) that determine a given behavior are known, then the behavior can be predicted to the limit of measurement of error. So long as this set of factor remains unchanged, the behavior also remains stable over time (Ajzen, 1991). In other word, it is expected that the casual relationships between intention and behavior, between intention and its indicators within TPB are stable when individuals remain in environmental context and this context are mostly unchanged. The past behavior might be treated as predictor of future behavior when these conditions of are met (Ajzen, 1991). Under the assumption that intention-behavior relation is temporarily stable and past behavior doesn't influence future behavior, this study uses cross-sectional design and self-reported frequency of past behavior to measure the fish consumption behavior and its determinants.

2.3.Intention as motivation to behave

According to Wollwitzer (1993), traditional psychologists considered intention as act of willing and intention as needs. The "will psychology" school argued that forming intention is to assure the implementation of critical behaviors. The act of forming an intention somehow furthers the execution of the behavior. The school of intention as need considered forming intention as a function that helps individuals to achieve respective outcomes and to perform relevant behavior. Modern psychology considers intention as a source of commitment (Wollwitzer, 1993), in which forming intentions play functions of attempts to realize the individual wishes and desires. It is distinguished between goal intention and implementation intention. On the way to persuading a critical outcome, goal

intention play role in solving the conflicts between various wishes and desires, whereas implementation intention is formed to solve conflicts between different potential routes to implementation (Wollwitzer, 1993).

Within conceptualization of TPB, intention is defined as individual's estimate of the likelihood that he/she will actually perform the critical behavior. Intention is assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, how much effort they are planning to exert, in order to perform the behavior (Ajzen, 1991). In this conceptualization, intention is considered as mediators of attitude-behavior relationship. Whereas the attitude represents an evaluation of the action, the respective intention is seen as the result of a decision to execute this action and thus represents the person's willingness to act. The formation of intention is seen as dependent on the person's attitude toward the behavior, normative pressure and perception of difficulties and ease to execute the behavior. A behavioral intention will be performed when behavioral attitude is positive, subjective norms favor the execution, and individuals perceive the opportunities to perform the action (Ajzen, 1991).

This study defines intention as motivation of individuals toward eating fish. Intention thus is measured as likelihood that a person's willingness to engage in consuming seafood (Fishbein & Ajzen, 1975: Ajzen, 1991). The construct is often measured in term of *will*, *expect*, *should*, *wish/intend*, *determined or want* with the probability estimates such as "*unlikely and likely*" in social science (Armitage & Conner, 2001) and also in food consumption context (Sparks *et al*, 1992; 1995; Verbeke & Vackier, 2005).

Intention is proposed as the closest cognitive antecedent of actual behavioral performance rather than attitude (Fishbein & Ajzen 1975; Gollwitzer, 1993; Triandis, 1977). The theorists suggested that a specific behavior could be predicted when the behavioral intention is appropriately measured (Ajzen & Fishbein, 1975; 2005), Many studies have substantiated the predictive validity of behavioral intention. Meta-analyses covering diverse behavioral domains have reported the mean intention-behavior correlation of from .44 to .62 (see Ajzen & Fishbein, 2005, for a review). The studies in seafood consumption also confirm the important role of intention in determining the behavior frequency. The studies reported a high positive correlation between intention and fish consumption frequency of around .65 (Olsen, 2001; Verbeke & Vackier, 2005).

However, a low correlation between intention and behavior was also reported in social science. According to Ajzen and Fishbein (2005), instability of intention and incompatibility of intention and behavior measures are main factors responsible for the low correlation. There are a number of events that may cause intention to change during the time interval between measurement of intention and assessment of behavior. This implies that the short time interval between measurements of the two constructs is necessary to ensure the stability of intention. In addition, intention and attitude that is assessed on general level respective to behavioral categories are not expected to be good predictors of specific behavior (Ajzen & Fishbein, 2005).

2.4. Attitude toward attributes, products, and activities

2.4.1.Attitude as global evaluation

In the early day, attitudes were very broadly defined as "a mental and neutral state of readiness" (Allport, 1935). Attitudes were assumed to exert a directive or dynamic influence upon the individual's response to all objects and situations that it is related. According to Krosnick *et al* (2005), this definition considering attitudes as predispositions that motivate social behavior is too broad in attempt of measurements. Thus, the definition of attitude has been evolved considerably, focusing much more on approach and avoidance behavior. Common to all of definitions, attitudes are often considered as an evaluative or cognitive process, and a disposition to the behave in certain ways (Jaccard & Blanton, 2005). A broadly accepted definition of attitude is as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken 1993, p.1). In this definition, attitude is focused on a particular entity or object, rather than all objects and situations with which it is related; and an attitude is a predisposition to like or dislike that entity.

According to the multicomponent view of attitude, all responses to a stimulus object are mediated by the person's attitude toward that object. These responses then are classified into three categories called as three components of attitude. *Cognitive component* refers to perceptual response and verbal statement of belief; *affective or emotional component* are sympathetic nervous responses and verbal statements of belief; and

behavioral or conative component implies overt actions and verbal statement concerning behavior (Fishbein & Ajzen, 1975). Although any response can be used to infer a person's attitude (Fishbein & Ajzen, 1975), a single evaluative score cannot adequately represent the attitude construct in all its complexity (Ajzen & Fishbein, 2005).

Several investigators distinguish the evaluative and affective response in the way of forming attitude (Ajzen, 1991; Ajzen & Driver, 1992). Evaluative response refers to individual's evaluation of a given behavior and its consequences in a favorable or unfavorable fashion (Fishbein & Ajzen, 1975). Evaluative response in empirical research is often assessed associated to two components: their valence (direction) and extremity. The valence component deals with positive or negative direction (Thurstone, 1946), whereas extremity refers to how strongly that position is held (Zanna & Rempel, 1988). Affective response associated with performance of behavior may be important determinant of attitude and intention, especially in situation where consequences of the behavior are unpleasant or negative affectively laden (Conner & Armitage, 1998). It is argued that if an individual anticipates feelings of regret after performing a behavior, then he/she will be unlikely to perform the behavior again.

This study defines attitude as an association in memory between a given object (e.g., a fish product) and a given summary evaluation of the object (Fazio, 1995). The attitude is assessed as the overall evaluations of individual toward fish consumption by some integrated items without focusing on any different dimensions or facets of attitude.

When attitude is assessed at general level, it is expected to be an appropriate predictor of behavioral categories (Fishbein & Ajzen, 1975). However, this relationship may be mediated through behavioral tendency (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 2005). Empirical evidence in social science and marketing research shows that when the principle of compatibility is met, overall attitude correlates well with intentions, the mean correlations range from 0.45 to 0.66 (Ajzen & Fishbein, 2005). In addition, some studies also reported a highly direct correlation between general attitude and behavioral categories. According to Ajzen and Fishbein (2005), when the behavior in which people have relatively little volitional control, the low correlation between intention and behavior may occur and high direct attitude-behavior correlations are found.

2.4.2.Attitude as evaluation of attributes and activities

According to Fishbein and Ajzen (1975), general attitude toward an object (e.g. product) is formed by salient beliefs. Salient beliefs are defined as "the subjective probability of a relation between the object of the belief and some other object, value, concept, or attribute" (Fishbein & Ajzen, 1975).

Within the marketing literature, salient beliefs are defined and assessed as quality attributes and quality cues (Peter & Hans, 1995). In principle, product quality beliefs can be established by descriptive, informational, and inferential formation (Fishbein & Ajzen, 1975). *Descriptive beliefs* are formed through direct observation (e.g. tasting or seeing a food product) of characteristics of products. *Informative beliefs* are formed by accepting information about product attributes provided by outside sources such as friends, advertisements, or consumer magazines. *Inferential beliefs* are formed by a perception process that is based on prior beliefs activated in memory, concerning the perceived relationship between a cue and a product attributes, and new information acquired from environments (Steenkamp, 1990; Peter & Hans, 1995).

The quality concept in marketing perspective is often discussed in terms of perceived quality. According to Peter and Hans (1995), perceived quality may be formed by experience quality attributes or credence quality attributes. The experience quality attributes are based on actual consumption whereas credence quality attributes remain purely cognitive. For example, taste, freshness, convenience are most important experience quality attributes while nutritional value, healthfulness, naturalness, wholesomeness ect. are given to be credence quality attributes (Peter & Hans, 1995).

In the cases where there is a lack of opportunities to form experience and credence quality attributes, consumers may evaluate quality of product through quality cues. Olson and Jacoby (1972) classified intrinsic and extrinsic quality cues in forming perceived quality. Intrinsic quality cues are closely related to the physical characteristics of products. For example, appearance, colour, shape, and size are important intrinsic cues in evaluating food quality product (Peter & Hans, 1995). When on other information is available and one has to judge the quality of two similar products, the extrinsic quality cues such as price and brand are alternative indicators in evaluating product quality (Peter & Hans, 1995).

In marketing literature, price and value are considered as having high-level abstractions of salient beliefs. Price is distinguished between objective price (actual price of a product) and perceived price (price is encoded by consumer) (Jacoby & Olson, 1977). Several studies reveal that consumers do not always know or remember the actual price of products. Instead, they encode prices in ways that are meaningful to them. For example, consumers sometime judge that product X (e.g. fish) is cheap or expensive in general or in comparison with other products rather than remembering the actual price exactly. Similarly, value is a perception of individuals about a given object, in which involves a trade-off of give and take components (Zeithaml. 1988). According to Zeithaml (1988), value has diverse meaning and has different counterparts. Value can be judged as low price, suitability or convenience. Moreover, perceived price and value reflect not only individualistic and personal characteristics, but also the consumer's opportunities and resources in carrying out an intended purchase (Zeithaml, 1988). Perceived price and value are intrinsic cues in evaluating product quality and also barriers against product purchase.

In modern societies, convenience is perceived as important characteristics in selecting a product. According to Gofton (1995), convenience is an outcome of product use, and relates to the capacity of consumer to employ a particular resource as well as simple time available. Convenience is a complex concept in marketing literature. Convenience is not only the ease of purchase or quick consumption, it also means saving of time, physical or mental energy at one or more stages of the overall meal process such as planning and shopping, storage and preparation of products, consumption, and the cleaning up and disposal of leftovers (Gofton, 1995)**.** Furst *et al* (1996) mentioned time as important component of convenience, and time is often spoken as commodity to be spent and saved.

2.4.3.Attitude toward food and seafood

In food and seafood context, attitudes are suggested to be one of the main determinants in explaining food consumption (Bredahl & Grunert, 1997; Olsen 2001; 2004; Shepherd & Raats, 1996; Verbeke & Vackier, 2005). The correlation of attitude with intention was reported significantly high, being in range of 0.38-0.55 in food as well as seafood context (Olsen, 2001; 2005; 2007; Shepherd & Raats, 1996; Saba & Vassallo,

2002; Verbeke & Vackier, 2005). It was also reported a significant correlation within 0.26-0.40 between attitude and behavior. The impact of attitude on intention and behavior in food/seafood studies were reported to be much higher than those impacts of norms and perceived control (Olsen, 2001; 2007; Verbeke & Vackier, 2005).

Seafood is usually evaluated as a high quality product. Taste, nutrition, freshness, health, and appeal are mostly considered as salient food attributes forming a general attitude of food (see Olsen 2004 for a review). These attributes are also suggested to be the most important in evaluating food products (Olsen, 1999; Steptoe *et al*, 1995). Taste and distaste are more important for younger consumers (Berg, Johnson & Conner, 2000) while elderly people are more concerned about of nutrition and health (Roininen & Lahteenmaki, 1999). Seafood is evaluated as healthier but not tastier than meat and chicken. This explained why most empirical researches reported that elderly people are found eating fish and seafood more often than younger people do (Olsen, 2004).

Generally, taste, appearance, and texture are main indicators in evaluating quality of seafood products. Appearance and texture are important cues that make consumers feel more confident in their evaluation of seafood products. Appearance refers to the freshness of the product. Consumers perceive frozen products as "non-fresh", of "bad quality", "tasteless", "watery", "boring" or similarly negative (Olsen, 2004). Freshness is evaluated as being of superior quality compared to frozenness. In contrast, frozen seafood is less associated with bones, "bad" smell, and is perceived as more convenient (Olsen, 2004).

Some attributes or beliefs like unpleasant smell and bones only contribute negatively to the development of seafood attitudes. For example, several studies show that unpleasant smell and bones are significant reasons for less motivation to consume food across different countries (Bredahl & Grunert, 1997; Leek *et al*, 2000; Olsen, 1999).

Several studies also reported that other attributes of fish products are able to impact on attitudes toward the fish purchase such as price/cost, convenience and availability. While Leek *et al* (2000), Honkanen *et al* (1988), and Olsen (2004) reported that price, value for money and household income were not perceived as barrier for seafood consumption, Verbeke and Vackier (2005) found that price had negative impact on attitude toward fish consumption in Belgium. Convenience proves to be a very important attribute of food choice (Steptoe *et al*, 1995). Fish is perceived as very inconvenient because of the

need to invest a large amount of time and effort to various stages of cooking and preparing (Gofton, 1995). A cross-cultural study in European countries found that consumers who perceived fish as inconvenient have significantly worse attitudes toward fish, and perceived inconvenience of fish also has a directly negative effect on fish consumption (Olsen *et al*, 2006). Convenience is also considered as situational factor for food choice (Gempesaw *et al*, 1995) and fresh fish is chosen if it is available (Olsen, 2004).

The study considers that perceived quality, healthiness, appeal, perceived price and value, and convenience are the main attributes that influence fish consumption behavior. Perceived quality is defined and measured in both evaluative responses and negative effects. Convenience is assessed in several aspects such as time consumed to cook and prepare, availability, and suitable usage of product (e.g. fish product). Price and value are defined as individual perceptions about the costs of consuming fish rather than focus on actual price and cost, and assessed by several integrated items.

Perceived quality is recognized to reflect personal and individualistic characteristics in evaluating products whereas perceived price and convenience not only reflect personal traits in evaluating product but also carry out perceived opportunities and obstacles to engage behavioral intention (e.g. fish consumption) (Zeithaml, 1998; Gofton, 1995). More specifically, the study assumes perceived quality, and healthiness influence only attitude whereas perceived price, availability, and convenience are determinants of both attitude and personal control.

2.5. Norms and social expectations

Social norms of a person refer to his perception of environmental referents that are important to him think he should or should not perform the behavior in question (Ajzen & Fishbein, 1980). Generally, social norms are defined and measured as perceived social pressure or expectation from people in general (subjective norm) or specific groups or individuals (normative beliefs). Ajzen (1991) suggested that social norms can be measured by asking respondents to rate the extent to which “important others” would improve or disapprove of his performing a given behavior.

Social norm reflect the social aspect in the nature of human. Human behavior is influenced by not only personal considerations but also by perceived social pressure. TRA and TPB propose that behavioral intention should be predicted by both attitudes and subjective norms. Individuals differ consistently in the amount of weight they place on attitudinal and normative consideration. Empirical evidences show that for some people, personal considerations were better predictor of intentions than were subjective norms, whereas for other individuals, subjective norms are stronger predictor than attitudes (Ajzen & Fishbein, 2005).

The empirical research and meta-analysis in social science show that subjective norm is a weakest predictor of intention and behavior (Ajzen, 1991; Conner & Armitage, 1998; 2001). The explanations for such weak effect include measurement's problems and failure to tap appropriate components of normative influence. Especially, some researchers have argued to remove the construct from analysis for reasons of its inadequate and rarely predict intention (Conner & Armitage, 2001). In the marketing literature, the findings is mixed but most studies reported that subjective norms is independent and important in explaining consumer intention and behavior (Ryan, 1982; Thogersen, 2002)

Subjective norms are assumed to be formed by normative beliefs, which are social pressures and expectation from specific referents, individuals or groups. Within TRA, the subjective norms of a person may be assessed by perceived expectations of specific referent individuals or groups, and his motivation to comply with those expectations. In the food/seafood context, family expectation, moral obligation and health involvement are considered as main indicators of social norms that facilitate or inhibit the seafood consumption (Olsen, 2001, 2004; Koivistro & Sjoden, 1996; Verbeke & Vackier, 2005). Rozin and Vollmecke (1986) showed that social factors are more important than genetic factors influencing individual differences in food preferences. The foods that are rejected by most or probably some family members are not likely to be severed in family menu (Koivistro & Sjoden, 1996). Children's dislike of seafood but like of hedonic consumption in a modern household is a barrier against seafood consumption (Olsen, 2004). In addition, seafood is matter of like and dislike so many families feel ambivalence and conflicts when seafood is placed as family meal (Olsen, 2004).

The study defines subjective norms as social pressures and family expectation that determine behavioral intention in consuming fish. The concept is assessed by global measures rather than focus on normative beliefs.

2.6. Perceived behavioral control and opportunities

Empirical evidences show the sometime behavior is not completely under volitional control as TRA suggested. A behavioral intention would not be executed if the person perceives that they do not have opportunities and resources to perform the action, in spite of his strongly favorable attitudes and under high social pressures. A given behavior will be more likely to occur when individuals have both the ability and motivation to perform the behaviours than when they have only one or neither.

Perceived behavior control within TPB is defined as individual's perception on the difficulties or eases to perform a given behavior. According to Ajzen (1991), the concept of perceived control in TPB is different from locus of control concept. Locus of control concept refers to generalized expectancy that outcome of a person is determined by his own behavior (e.g. perceived controllability). In addition, Ajzen (1991) argued that PBC in TPB is most compatible with the self-efficacy concept in which all are concerned judgments of how well one can execute a given action required to deal with prospective situation. However, some investigators reported that these concepts are not synonymous (Conner & Armitage, 1998).

The impact of PBC on behavior may be directly or mediated via behavioral tendency (Ajzen, 1991). Many empirical studies support both versions of impact. For a wide range of behavior, different meta-analyses show that the mean correlations of intention and PBC range of 0.35-0.46 (Ajzen & Fishbein, 2005). Conner and Armitage (1998) reported that average multiple correlation of intention and PBC with behavior is 0.52, accounting for 27% of the variance. When introducing PBC, the component added an average of 2% to prediction of behavior (over and above intention) and added 6% of the variance of intention (over and above attitude and norms) (Armitage & Conner, 2001).

In food and seafood context, PBC has also been found to be a significant predictor of behavior and intention (Shepherd & Raats, 1996; Verbeke & Vackier, 2005). In the

study of Shepherd and Raats (1996), perceived control was found to be the most significant influence on behavioural intention of consuming organic vegetables, the regression coefficient of 0.26. Verbeke and Vackier (2005) reported that PBC had significant positive impact on both of intention and fish consumption frequency in Belgium, the regression coefficients in original TPB model were of 0.27 and 0.21, respectively. The correlation coefficients were also significant high between PBC with intention (0.53) and behavior (0.478) in study of Verbeke and Vackier.

Within TRA and TPB, PBC is assumed to have its antecedents from salient control beliefs. Several investigators suggest that identifiable control factors may be either internal to the person (e.g., skills, abilities, power of will, compulsion) or external to the person (e.g., time, opportunity, dependence on others). *Internal control* refers to whether performance of a behavior is difficult or easy, whereas *external control* concerns whether the individual feel in complete control over performing the behavior (Armitage & Conner, 1999). Although the nature of the two identifiable factors remains unclear, measures of PBC construct should combine items that reflect both factors (Ajzen & Fishbein, 2005). In the food and seafood context, the product attributes such as cost/price, convenience, and availability are considered as perceived control's antecedents (Steptoe *et al*, 1995; Gofton, 1995; Furst *et al*, 1996; Leek *et al*, 2000; Olsen, 2003).

Price and value were reported having mixed impact on personal control over fish consumption. In many countries, fish is perceived as expensive and price level affects the consumer's choice (Brunso, 2003). However, the studies in the rich countries like as UK (Leek *et al*, 2000), Finland (Honkanen *et al*, 1998), Belgium (Verbeke & Vackier, 2005) and Norway (Myrland *et al*, 2000) show that price and value for money are either not, or less significant factors in explaining variation in buying seafood. Inconvenience and scarcity are reported as significant barriers to consuming fish (Gofton, 1995). Elderly people consider seafood as more convenient compared to the younger consumer and this may be explained by the experiences accumulated over year of the elderly in buying and preparing seafood meal (Olsen, 2003, 2004).

In this study, PBC is defined as an integrated component of internal, external control and contextual factors that consumers may perceive its ease or difficulties to perform their intention to consume and engage in fish consumption. The component is

assessed in general aspect on how individuals perceived their control over the difficulties and barriers for fish consumption. In a further investigation, price/cost, availability, and convenience are assumed as main determinants of personal control over eating fish.

2.7. External and other factors

Within TRA and TPB, Fishbein and Ajzen (1975) and Ajzen (1991) mentioned the external factors such as personal traits, moral norms, past behavior and habits. The authors suggested that the theories are open to inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behavior (Ajzen, 1991). From conceptual and empirical perspectives, several authors found some of other factors can be significant predictors of intention and behavior such as past behavior & habit, moral norms, self-efficacy, self-identity, and negative affect (see Conner & Armitage, 1998). The studies discuss and assess some of these factors that are mostly found in food and seafood context, and may be used in future studies.

2.7.1. Habits

Eagly and Chaiken (1993) and Sutton (1994) argued that many behaviors are determined by one's past behavior rather than by cognition as described in Fishbein and Ajzen models. Habit is often defined as "a learned sequences of acts that have become automatic responses to specific cues, and are functional in obtaining certain goals or end states" (Verplanken & Aarts, 1999, p.104). The repetition of the behavior is necessary condition to form a habit. However, habit should be considered as a psychological construct rather than past behavioral frequency (Ajzen, 1991; Aarts *et al.,* 1998). The role of habit in developing behavior pattern was conceptualized by model of Triandis (1980) and explored in many empirical studies (see Conner & Armitage, 1998 for a review).

In the food context, habit is perceived as a particularly important factor determining food consumption patterns. Shepherd and Sparks (1994) reviewed habit as significant related to the consumption of sweet, salty, fatty foods, and coffee. In the seafood perspective, habit was also explored as an important indicator in explaining the variance of consumption frequency as well as intention (Honkanen *et al*, 2005; Verbeke & Vackier, 2005). Verbeke and Vackier (2005) reported that when habit was added, the explained

variance of behavioral intention improved from 30.8% to 52%, and the explanation of behavior increased from 41.9 to 44.3 %.

2.7.2. Involvement

Along with intention, goals, and desire, other motivation constructs like involvement, importance, and interests are also suggested as mediators of attitude-behavior relationship Boninger *et al*, (1995). Involvement is defined as an individual's subjective sense of the concern, care, importance, personal relevance and significance attached to an attitude (Boninger *et al*, 1995). The concept of involvement has received a good deal of attention in consumer research. In the seafood context, involvement considered as reflecting motivation to fish consumption was reported a significant mediator of relationship between attitude and behavioral frequency (Olsen, 2001). The construct was also found to be a complete mediator of satisfaction (e.g. overall evaluation) and repurchase loyalty (e.g. purchase frequency), and a partial mediator between social norm, PBC and the loyalty (Olsen, 2007).

2.7.3. Health consciousness

An orientation toward healthy eating is increasingly accompanied by an increase of living standard and age. Several studies also reported that elderly people are more health conscious than younger people (Roininen *et al*, 1999; Olsen, 2003). Fish and seafood products have been promoted as health food by governments and public agencies in many countries. The fact is that almost all consumers perceive fish as healthy (Bredahl & Grunert, 1997). Health consciousness was reported having significant impact on attitude toward seafood consumption and consumption frequency (Olsen, 2003). Elderly people are more concerned with nutrition and healthy eating. Olsen (2003) found that a high correlation between age and seafood consumption is mediated via health consciousness. Moreover, some studies also indicated that health consciousness or importance of healthy eating that reflect motivational aspects are more appropriate factors in explaining fish consumption than beliefs that fish is healthy (Foxal *et al*, 1998; Olsen, 2001; 2003; Gempesaw *et al*, 1995).

2.7.4. Moral norms

Ajzen (1991) suggested adding *moral norm* into the models, in parallel with attitudes, social norms and PBC for predicting intention and behavior. The argument is that in some circumstances, people consider "not only the social pressure but also personal feelings of moral obligation or responsibility to perform or refuse to perform a certain behavior". This suggestion is supported by a numbers of studies (Ajzen, 1991; Conner & Armitage, 2001). Conner and Armitage (1998) reported the relationship between moral norm and the components of TPB are reasonably large. Kurland (1995) found that moral obligation added more to the prediction of intention of than did attitudes and SN.

Moral concerns might play a significant role when food is chosen for other individuals (Shepherd, 1999). This argument is supported by a study of Olsen (2001) where the model considered personal feelings of responsibility to ensure healthy eating habits within the family as an independent factor for explaining variances in motivation for consuming seafood in Norway. Moral obligation is shown to be the second most important predictor of seafood involvements (Olsen, 2001). Obligated feelings to sever healthy meals also used to explain for why seafood consumption increases with size of the household in the study of Myrland *et al* (2000).

2.7.5. Knowledge

In food and seafood context, knowledge may be also a barrier that inhibits the motivation toward fish consumption. Knowledge is an internal resource that can be linked to evaluating the quality of raw material, preparing and serving the final meal and its ingredients. However, knowledge factor as barriers for seafood consumption has been not yet investigated fully (Olsen, 2004).

The constructs of habit, involvement, health consciousness, and knowledge will be assessed in this study by mean of description, and test of reliability and mean difference rather than deeply considered by causal relationships.

2.8.The model applications and hypotheses

TRA and TPB are probably applied most commonly in many spheres like health behavior, consumer behavior, marketing research, social psychology and food consumption behavior. Many evidences from meta-analyses support TPB and TRA for explaining and predicting intention and behavior (Ajzen, 1991; Godin & Kok, 1996; Sutton, 1998; Conner & Armitage, 1998; Armitage & Conner, 2001). These studies showed that the models explained an average of 40%-50% of variance in intention, and between 19%-38% of the variance in behavior (Sutton, 1998). In food and seafood studies, the models explained for around of 40% variance of behavior and 52-63% of intention (Shepherd & Raats, 1996; Olsen 2001; 2003; 2005; 2007; Verbeke & Vackier, 2005).

The TRA and TPB are extended and modified in different way by social as well as marketing researches. In food and seafood studies, the models have been extended by considering constructs of moral obligation (Shepherd & Raats, 1996; Olsen, 2001; Saba & Vassallo, 2000), habit (Verplanken & Faes, 1999; Verbeke & Vackier, 2005); involvement (Svein, 2001; 2007), self-efficacy (Spark, Shepherd & Frewer, 1995; Shepherd & Raats, 1996; Norman & Conner, 2006). The models have been applied in form of summative beliefs which each constructs are measured by two components as TRA and TPB proposals (Shepherd & Raats, 1996; Verbeke & Vackier, 2005; Sparks & Sheppherd, 1995) or in a direct and established form (Verplanken & Faes, 1999; Olsen, 2001; 2003; 2007; Norman & Conner, 2006).

The present study uses a modification of TPB, which includes TRA, for its causal relationship test; the framework is presented in Figure 2.1. Two causal models related to original TPB and the extension are estimated. The basic model is estimated as same as initial TPB. The attribute beliefs model is a further investigation of determinants of attitude and personal control on fish consumption.

In testing basic model, it is assumed that all relationships within TPB are significantly positive, which were confirmed by many empirical researches (Ajzen, 1991; Fishbein & Ajzen, 2005; Shepherd & Spark, 1994; Verbeke & Vackier, 2005). More specifically, the following relationships are expected:

(1) Fish consumption is significant determined by intention and personal control;

(2) Intention is significantly determined by attitude, social norm, and personal control.

By testing the attribute beliefs model, the study tries to investigate (i) whether there is significant relationships between some beliefs (product attributes) general attitude and personal control, (ii) what is the valence of these relationships, and (ii) which of these attributes are most important? The antecedents of general attitude and PBC are not found consistent among empirical researches. Based on theoretical suggestions and some empirical findings in literature, the following relationships are assumed:

(3) The beliefs about quality, negative effects, value, healthiness, availability, and convenience significantly impact on general attitude;

(4) Beliefs about value, convenience, and availability significantly impact on personal control.

Some attributes are perceived as complex concept. For example, convenience can be understood as time consumed to cook and prepare fish as meal, or be the suitability of fish for variety of dishes in different occasions (Gofton, 1995). Therefore, the attributes are assessed by various items that reflect the their different aspects. The exploratory factor analysis will be achieved to extract the latent sub-components from the items.

3. Data and Methods

This part presents the process of data collection, questionnaires and analysis methods. The section places an emphasis on the designing items to measure the constructs. Factor analysis, structural equation modeling, and testing for the reliability of constructs and mean difference are main methods mentioned in the section

3.1. Data collection

Survey data were collected by questionnaire in Bacninh, an inland province in the Northern of Vietnam, in August 2006. The respondents were personally interviewed at home and completed a questionnaire requiring 30-45 minutes of their time. The numbers of interview performed was approximately 220. 208 questionnaires were completed in the main parts and then chosen for the study. Females dominated in the sample of respondent (64.7%); the age of the respondents ranged from 18 to 72 years; the samples were taken in 61.1% urban and 38.9% rural areas. The respondents were divided into two groups depending on whether they had graduated from high school or not. The table 3.1 shows details of the sample.

Table 3.1: Socio-demographic characteristics of the sample (% of respondents, n = 208)

Gender	Male	35.3	Family size	1-2 persons	3.5
	Female	64.7		3-4 persons	54.0
				≥ 5 persons	42.5
Education	≤ high school	17.4			
	> high school	82.6	Children in household	Yes	67.0
				No	33.0
Age	≤ 25 years	27.8			
	26-40 years	53.2	Income of family	≤ 2 mills	30.8
	41-55 years	18.0	(VND)	2-4 mills	48.7
	> 55 years	1.0		≥ 4 mills	20.5
	Mean (*SD*)	31.8 (*10.1*)			
			Income of respondents	≤ 1 mills	39.0
Area	Rural	38.9	(VND)	1-2 mills	50.8
	Urban	61.1		≥ 2 mills	10.2
			Marital status		
				Single	33.8
				Married	66.2

The final data was coded, checked for outliers, normality, and linearity by SPSS package. Factor analysis and reliability test were implemented in next step to extract latent sub-constructs and examine the most reliable measures of the constructs. Descriptive

analysis and test of mean difference were performed to deeply and fully understand the measures. Structural equation modeling was employed for two purposes, namely as confirmatory analysis of constructs and causal model test.

3.2. Measurement

3.2.1. Consumption and behaviors

The study defines behavior as fish consumption of individuals in general, without any specificity in species or product, without concerning context and time that behaviors occur. The fish consumption behavior is measured by *self-reported perceived frequency of past behavior.* The question of "how many times in average during last year you have consumed fish as a meal" used to measure the behavior have been applied commonly in marketing and social science, also in the area of food consumption behavior (Raats *et al,* 1995; Myrland *at al,* 2000; Olsen 2001, 2005; Verbeke & Vackier, 2005). The question is presented with ten alternatives of choice from eating "two times a day" (level 10) to "never" (level 1). The study assumes that fish consumption frequency correlated positively linearly with attitudes. This means the higher fish consumption frequency is, the higher favorable attitude toward to products is.

Please make a ☒ for each alternative how many time in average during last year you have consumed fish as a meal

	2 times a day	1 time a day	5-6 times a week	3 - 4 time a week	2 time a week	1 time a week	2 - 3 time a month	1time a month	Several time a year	Never
	10	9	8	7	6	5	4	3	2	1
At home	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Away from home	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑

In addition, an item designed to measure "eating fish away from home" is also presented. This measure is only for understanding pattern of consumption and compared with eating at home rather than for testing casual model because the two measures are in different contexts.

3.2.2.Intention to consume fish

Within TRA and TPB framework, individual behavior is assumed as under volitional control. Intention is a measure of the likelihood that a person will engage in a given behavior (Fishbein & Ajzen, 1975: Ajzen, 1991). This study considers behavioral intention reflect the individual willing to eat fish and the construct is assumed as a mediator of the relationship between behavior with attitude, norms, and personal control.

With respect to the principality of compatibility, intention is measured as motivation to consume fish in global level. The construct is usually been measured in term of *will*, *expect*, *should*, *wish/intend*, *determined or want* with the probability estimates such as "*unlikely and likely*" (Armitage & Conner, 2001). In theoretical perspective, several authors make distinctions among these terms. However, the explanations like *expect, plan* and *want* are more frequently used to measure intention in empirical researches in social science and seafood consumption studies (Armitage & Conner, 2001; Sparks, 1992; 1995; Verbeke & Vackier, 2005). The respondents were asked to score their probability of intention of eating fish in three days, which anchors from 1 (very unlikely) to 7 (very likely), and the middle of 4 is neutral estimation.

Please indicate how likely it is that you plan/expect/want to eat fish as a meal during the next 3 days including today.

	Very unlikely 1	2	3	4	5	6	**Very likely** 7
I plan to eat fish	❑	❑	❑	❑	❑	❑	❑
I expect to eat fish	❑	❑	❑	❑	❑	❑	❑
I want to eat fish	❑	❑	❑	❑	❑	❑	❑

3.2.3. General attitude and attribute beliefs

In this study, attitude is defined as an association in memory between a given object (e.g., a fish product) and a given summary evaluation of the object (Fazio, 1995). Attitude toward fish consumption is firstly assessed as global evaluation without any specificity in product items, times or context when the consumption occurs. Global attitude and evaluative responses in attitude research are usually assessed by their valence and extremity. The valence is often assessed by terms expressing good/bad, positive/negative,

pleasant/unpleasant, wish/foolish, favourable/unfavourably, like/dislike, unsatisfactory/satisfactory, whereas extremity is assessed in unipolar scale with judgment estimate of agree-disagree (Eagly & Chaiken, 1993).

Several authors try to distinguish different facets of attitude such as cognitive, affective and conative components. However, this study uses five integrated items in semantic differential formats to assess the overall attitude without focusing on any component. Respondents are presented with sentence "In the following we would like you to think about how you feel when you eat fish as meal. The level you evaluate fish as a meal will increase from 1 (negative feeling) to 7 (positive feeling)". The bipolar adjectives were bad/good, unsatisfied/satisfied, unpleasant/pleasant, dull/exiting, and negative/positive. These items are used to assess general attitude in both marketing (Stayman & Batra, 1991) and seafood consumption behavior (Olsen, 2001; 2007; Verbeke & Vackier, 2005).

When I eat fish, I feel....

	1	**2**	**3**	**4**	**5**	**6**	**7**	
Bad	❑	❑	❑	❑	❑	❑	❑	Good
Unsatisfied	❑	❑	❑	❑	❑	❑	❑	Satisfied
Unpleasant	❑	❑	❑	❑	❑	❑	❑	Pleasant
Dull	❑	❑	❑	❑	❑	❑	❑	Exiting
Negative	❑	❑	❑	❑	❑	❑	❑	Positive

The scores from 1 to 3 present the negative evaluations while positive evaluation is in categories of 5, 6, and 7. The middle of 4 reflects the ambivalent feelings in evaluation.

According to TRA and TPB, attitude toward an objective (e.g. fish product) or behavior (fish consumption) can be assessed by salient beliefs. This study considers perceived quality, healthiness, appealing and negative affects are main salient food attributes forming a general attitude of food (see Olsen 2004 for a review). The perceived quality is assessed though three items of appearance (intrinsic cue), taste and texture (experience attributes) (Peter & Hans, 1995; Olsen, 2004). Healthy construct is assessed by two items of "fish as meal is healthy" and "fish as meal is nutritious" that is adopted Steptoe *et al* (1995), and mentioned by Peter and Hans (1995) as credence quality attributes. Appealing attribute is assumed that fish as meal is suitable for elderly and attracting children. Fish as meal suitable to elderly and appealing children are assumed to

be one factor. The items are presented in semantic differential formats with 7-points scale from "very bad" to "very good", and a neutral score at middle of 4.

How would you evaluate fish as a meal along several different attributes? The evaluation is from very bad (1) to very good (7).

	1	**2**	**3**	**4**	**5**	**6**	**7**	
Bad taste	☐	☐	☐	☐	☐	☐	☐	Good taste
Bad texture	☐	☐	☐	☐	☐	☐	☐	Good texture
Bad appearance	☐	☐	☐	☐	☐	☐	☐	Delicate appearance
Unhealthy	☐	☐	☐	☐	☐	☐	☐	Healthy
Not Nutritious	☐	☐	☐	☐	☐	☐	☐	Nutritious
Not appealing children	☐	☐	☐	☐	☐	☐	☐	Appealing to children
Unsuitable for elderly	☐	☐	☐	☐	☐	☐	☐	Suitable for elderly

Unpleasant bones and smell are significant reasons for less motivation and willing to eat fish consumption (Leek *et al*, 2000; Olsen, 2001). This study also assumes that bones and smell are negative effects that reduce the attitude strengths toward fish consumption. The items of "unpleasant smell" and "unpleasant bones" were presented in differential semantic formats from "totally disagree" (score of 1) to "totally agree" (score of 7), a neither disagree nor agree at middle of 4. These items were used in several studies (Olsen, 2001; Verbeke & Vackier, 2005). This study also adds the third item of "I find it difficult to remove all bone out of fish" to measure the negative effects.

We are now suggesting several propositions related to bones and smell of fish as meal. For every propotision please indicate your agree or disagreement.

	Totally disagree			Neither disagree nor agree			Totally agree
	1	2	3	4	5	6	7
Fish has an unpleasant smell	☐	☐	☐	☐	☐	☐	☐
The bones in fish are unpleasant	☐	☐	☐	☐	☐	☐	☐
It is difficult to remove all bone out of fish	☐	☐	☐	☐	☐	☐	☐

3.2.4. Social norms and family expectation

The study defines subjective norms as social pressure and expectation that impact on people's seafood preference and choice. In social psychology, social norms are often measured by asking respondents to rate the extent to which "important others" would improve or disapprove of his performing a given behavior (Ajzen, 1991). In addition,

Terry (1996) suggested that when studying social influence it is important to pay attention to the specific personal relationship, specific group membership, cultural expectation that provide social context for all influence processes. In food context, family expectation is major determinants for food preference (Olsen, 2004) and mostly preferred to measure social norms (Olsen, 2001; 2007; Verbeke & Vackier, 2005).

The present study assesses subjective norms in global level by using two items related to "important others" and one refers to family expectation. These items were used broadly in social studies (Ajzen & Fishbein, 1980) as well as marketing researches (Olsen, 2001; 2007; Verbeke &Vackier, 2005). The alternatives choices range from *totally disagree* to *totally agree* in 7-point scale, neither disagree nor agree at score of 4.

	Totally disagree			Neither disagree nor agree			Totally agree
	1	2	3	4	5	6	7
People who are important to me want me to eat fish regularly	☐	☐	☐	☐	☐	☐	☐
My family want me to eat fish regularly	☐	☐	☐	☐	☐	☐	☐
People who are important to me expect me to eat fish regularly	☐	☐	☐	☐	☐	☐	☐

3.2.5. Personal control and control beliefs

Perceived behavior control is defined as individual's perception on the difficulties or eases to perform behavioral intention to consume and engage in fish consumption (Ajzen, 1991). Several investigators suggest that identifiable control factors may be either internal to the person (e.g., skills, abilities, power of will, compulsion) or external to the person (e.g., time, opportunity, dependence on others). Although the nature of the two identifiable factors remains unclear, measures of PBC construct should combine items that reflect both factors (Ajzen & Fishbein, 2005). The present study uses some integrated measures which involving internal and external control, and contextual factors to assess a global perceived control of individuals over eating fish.

Three items used in the study are of "How much personal control you feel you have over eating fish", ranging from 1 (not control) to 7 (complete control); "For me to eat fish is?", ranging from 1 (very difficult) to 7 (very easy); and "if I wanted to, I could easily eat fish tomorrow", anchored "very unlikely" (1) to "very likely" (7). The score at middle of 4 present an ambivalent choice. The combination of these items is frequently found in studies of social psychology (Fishbein & Ajzen, 1980; Armitage & Conner, 2001; and Conner *et al*, 2002; Norman, Conner & Bell, 2002; Norman & Conner, 2006) and food consumption studies (Shepherd & Raats, 1996; Kassem & Lee, 2003).

There can be several reasons for not eating fish as a meal: availbility of fresh fish, lack of time, price, konwledge of how to prepare fish, ect. Could you please evaluate your general ability or inability to have or eat fish as a meal.

How much personal control you feel you have over eating fish	Not control 1 ❑	2 ❑	3 ❑	4 ❑	5 ❑	6 ❑	Complete control 7 ❑
For me to eat fish is	Very difficult 1 ❑	2 ❑	3 ❑	4 ❑	5 ❑	6 ❑	Very easy 7 ❑
If I wanted to, I could easily eat fish tomorrow	Very unlikely 1 ❑	2 ❑	3 ❑	4 ❑	5 ❑	6 ❑	Very likely 7 ❑

Within TPB, perceived behavior control is assessed by a set of salient beliefs that deal with the presence and absence of requisite resource and opportunities (Ajzen, 1991). In food and seafood context, perceived price (value), convenience, and availability were found as important attribute beliefs that may inhibit or facilitate the performance of behavioral intention to consume fish (Olsen, 2003; 2004; Olsen *et al*, 2006). The availability is elicited by two items of "unavailable/available" and "difficult/easy to buy". The construct of convenience is probably most diverse. The convenience characteristics in fish consumption may be related to the process of preparing time, storage, cooking ways, and cooking time (Gofton, 1995). The latent factors (sub-convenience constructs) that fit the present data will be extracted for further analysis. The items of availability and convenience constructs are presented in 7 points scale very negative to very positive polar, a neutral score at middle of 4.

How would you evaluate fish as a meal along several following attributes? The evaluation is from very bad (1) to very good (7).

	1	**2**	**3**	**4**	**5**	**6**	**7**	
Difficult to buy	☐	☐	☐	☐	☐	☐	☐	Easy to buy
Unavailable	☐	☐	☐	☐	☐	☐	☐	Available
Much time to cook	☐	☐	☐	☐	☐	☐	☐	Fast to cook
Much time to prepare	☐	☐	☐	☐	☐	☐	☐	Fast to prepare
Difficult to store	☐	☐	☐	☐	☐	☐	☐	Easy to store
Unsuitable to cook for delicious meals	☐	☐	☐	☐	☐	☐	☐	Suitable to cook for delicious meals
Unsuitable to prepare for many dishes	☐	☐	☐	☐	☐	☐	☐	Suitable to prepare for many dishes
Unsuitable to cook in many ways	☐	☐	☐	☐	☐	☐	☐	Suitable to cook in many ways

Price and cost concept in marketing perspective have high level of abstraction (Zeithaml, 1988). Consumers often evaluate the price and cost of a product by "coded price" and perceived value rather than an absolute price. The study uses four items regarded to perceived value of fish consumption to assess the attributes of price and cost. These items were used in study of Steptoe *et al* (1995).

We are now suggesting several propositions related to price and value. For every propotision please indicate your agree or disagreement.

	Totally disagree			Neither disagree nor agree			Totally agree
	1	2	3	4	5	6	7
Fish is not expensive	☐	☐	☐	☐	☐	☐	☐
Eating fish is good value for money	☐	☐	☐	☐	☐	☐	☐
I choose to eat fish because it is economical	☐	☐	☐	☐	☐	☐	☐
Eating fish is suitable for my budget	☐	☐	☐	☐	☐	☐	☐

3.2.6. Other constructs and demographic information

Some constructs that are not involved in the framework of TPB are also added to the questionnaire. The additional constructs measured such as seafood involvement, habit of eating fish, knowledge for fish as meal, and general health involvement are recommend as important component in food and seafood consumption studies (Olsen, 2001; 2004). These constructs are only used for descriptive analysis and reliability test rather than deeply considered in causal relationship. The assessment of these constructs may be used for future researches.

Along with intention, involvement is assumed to capture the motivation of behavior (Boninger *et al*, 1995). The construct was reported as a significant mediator of attitude-behavior relationship in seafood consumption studies (Olsen, 2001; 2007). Involvement is often assessed by terms expressing *important, caring, concern, or interests* associated with attitude object, issues or action (O'Cass, 2000; Olsen, 2007). In this study, involvement is defined as an unobservable state of interest toward fish consumption in general. Three item expressing involvement in fish consumption is adapted from O'Cass (2000) and Olsen (2001; 2007).

We are now suggesting several propositions related to your interest of fish as meal. For every propotision please indicate your agree or disagreement.

	Totally disagree			Neither disagree nor agree			Totally agree
	1	2	3	4	5	6	7
Fish is an important part of my diet	☐	☐	☐	☐	☐	☐	☐
Fish means a lot to me	☐	☐	☐	☐	☐	☐	☐
I care a lot about fish	☐	☐	☐	☐	☐	☐	☐

Habit and past experience are suggested as substantial predictors in social science (Conner & Armitage, 2001) and also in food consumption study (Saba & Natale, 1999; Saba *et al*, 2000; Saba, 1998; Verbeke & Vackier, 2005). Habit is often measured as frequency of past behavior. However, Fishbein and Ajzen (2005) suggested the construct should be measured in term of habit strength. Verplanken and Orbell (2003) presented a 12-item self-report measure of habit, which includes subjective experiences of repetition as well as automaticity. This measure has shown good psychometric properties, and showed convergent as well as discriminant validity. The present study applies the two items from the list of Verplanken and Orbell (2003) and adds one item of "childhood" to measure the subjective experiences related to fish consumption.

We are now suggesting several propositions related to your habit of eating fish. For every propotision please indicate your agree or disagreement.

Eating fish is something…	Totally disagree			Neither disagree nor agree			Totally agree
	1	2	3	4	5	6	7
I am used to from my childhood	☐	☐	☐	☐	☐	☐	☐
That belongs to my weekly routine	☐	☐	☐	☐	☐	☐	☐
My family has habit of eating fish	☐	☐	☐	☐	☐	☐	☐

Health consciousness was reported having significant impact on food and seafood choice. In this study, health involvement is defined and measured as perceived importance of consuming fish. Three items used here is adopted from studies of Roininen *et al* (1999) and Olsen (2003).

We are now suggesting several propositions related to your consiousness of healthniness. For every propotision please indicate your agree or disagreement.

	Totally disagree			Neither disagree nor agree			Totally agree
	1	2	3	4	5	6	7
I think of myself as a health-conscious person	☐	☐	☐	☐	☐	☐	☐
I think of myself as the sort of person who is concerned about the long-term effects of my food choice	☐	☐	☐	☐	☐	☐	☐
I am probably the most health-conscious person in the family	☐	☐	☐	☐	☐	☐	☐
It is important for me to have variance in my diet	☐	☐	☐	☐	☐	☐	☐

Knowledge may be an internal resource that inhibits the motivation of eating fish. The construct is related to preparing, cooking, evaluating quality, ect. The study defines the construct as a general knowledge of individuals toward fish as meal. The construct is assessed by two items in 7 point-scale formats.

We are now suggesting several propositions related to your knowledge related to fish as meal. For every propotision please indicate your agree or disagreement.

I have a lots of	Totally disagree			Neither disagree nor agree			Totally agree
	1	2	3	4	5	6	7
Knowledges of how to evaluate fish quality	☐	☐	☐	☐	☐	☐	☐
Experiences related to fish as a meal	☐	☐	☐	☐	☐	☐	☐

In the end of questionnaire are some information needed to fulfill. The information is related demographic characteristics such as gender, age, marital status, income, education, and living area.

3.3. Analytical methods and procedures

The primary objectives of thesis are to explore the general patterns of behavior, intention, attitude, norms, personal control and barriers for fish consumption in Bacninh province; and a further understanding of the relationships among these constructs. The main analytical methods used are descriptive and causal analysis to achieve these objectives. T-test and ANOVA are also used to test the mean difference of items. Factor loadings and Cronbach's alpha are indexes to test of reliability. However, a stringent test of constructs' reliability and validity is performed later by confirmatory factor analysis.

3.3.1. Exploratory factor analysis and test of reliability

Factor analysis is a technique used widely to define the underlying structure in a data matrix. The method can achieve for purposes of exploratory and confirmatory perspective. The *principal component analysis* will be used in the thesis for two purposes. The first purpose is to overall inspect the convergent validity of proposed constructs by looking at the factor loadings of items. The second is to explore the latent constructs (sub-construct) if occurred for further analysis. The factors that have high loading factors of items indicate the convergent validity. The items that have high loadings in second factor should be considered if it may belong to different factors (Hair *et al*, 1995).

Before achieving factor analysis, an overall test suitability of data is performed based on Bartlett test of sphericity, and measure of sampling adequacy (MSA). Bartlett test of sphericity suggest the p-value less than 5% while MSA index suggest 0.6 as minimum value for significant of factor analysis (Pallant, 2005). In addition, a visual inspection of inter-correlation matrix of variables is also assessed. If the few coefficients are found that greater than 0.3, then factor analysis may not appropriate (Hair *et al*, 1995).

Latent root criterion (eigenvalues > 1) and orthogonal rotation method (Varimax) are chosen for defining number of factors and interpreting the factors, respectively. Only the items that have loading factors are greater than 0.5 will be extracted and used in subsequent analysis

Before performing further analysis, the study also tests the reliability of the constructs. Reliability is defined as the degree to which the independent variable is "error-free" (Hair *et al*, 1995). In the multivariate analyses, investigators often assume that there is not error in the measured variables. However, this assumption is considered as not reality from both theoretical and practical perspectives. Investigators cannot perfect measure a concept that is "error-free" of measurement. Practically, the studies usually use multi-items to measure a concept so that the items are expected to tap the "true" concept in consideration. In addition, a given concept may involve some different aspect or opinions that a give measure cannot tap concept fully. The multi-items are expected to reflect the whole meanings of concept. In order to examining to extent what the items describe the concept in question, investigators usually inspect the inter-correlation among those items (internal consistence).

The internal consistence of measures (reliability) is usually investigated by Cronbach's alpha. The higher value of Cronbach's alpha is the higher inter-correlations among measures are proved, it implies the higher reliability of measurements. The minimum acceptable level for a high enough of reliability among a given group of measures is 0.7 (Pallant, 2005). The group of items that Cronbach's alpha is greater than 0.7 is considered as reliable enough to describe the concept in question. However, the reliability of measures does not ensure validity of constructs (Hair *et al*, 1995). The convergent and discriminant validity of constructs must be tested by other techniques that are confirmatory factor analysis as presented in next sections.

In sum, the factor analysis and reliability test will examine whether the measures are suitable to describe the concept in question. High factor loadings of items indicate a good convergent reliability of the measures in describing the same constructs whereas a high Cronbach's alpha shows high inter-correlations among measures (Hair *et al,* 1995). However, Cronbach's alpha is only indicative to the existence of unidimensionality of multiple-indicators rather the reliability of the constructs (Hair *et al,* 1995). A more stringent way to test for reliability and validity are performed by confirmatory factor analysis and discriminant analysis by SEM-analysis (Anderson & Gerbing, 1998)

3.3.2. Descriptive analysis and mean difference tests

As one of first attempts, the study purposes to understand not only causal relationships among concepts but also general patterns of the behavior, attitudes, and beliefs toward eating fish. A full description of measures is performed to understand overall responses, general distribution and other aspect of scales.

According to TRA and TPB, demographic variables (ex. age, gender, income, ect.) may influence indirectly the behavior and its predictors. However, adding these variables into consideration accompany with psychological items are required complex techniques and procedures. In fact, there are not many empirical researches that combine these external variables in consideration within TRA and TPB. The present study will not add those demographic factors into causal model tests.

However, what happen for the causal relationships in the case that these external variables are significant impact on the behavior and its predictors. For example, if the mean of consumption frequency and other items are significant different between male and female, the results of model combining both groups into consideration is not correct in describing the relationships. In that case, the sample should be split into different parts regarded to male and female, and separated model associated to different groups are necessary. For this reason, the study will perform mean difference tests for different groups regarded to demographic factors. The two tail of t-test of independent sample for groups of gender, marital status, having children, and area will be employed. ANOVA is used to test mean difference among groups of income, age, and family size. The test of mean difference also helps to understand a deep pattern of items.

Procedures of factor analysis, reliability test, descriptive analysis and test of mean difference are performed by SPSS 14.0.

3.3.3. Confirmatory factor analysis

Structural equation modeling (SEM) is considered as a robust technique for test causal relationships. The method will be applied in the study for two purposes. A measurement model estimated to test the validity of constructs and structural model estimated is for investigating the casual relations among constructs within TPB (Anderson & Gerbing, 1988).

Validity of a given construct is defined as the extent to which the indicators "accurately" measure what they are supposed to measure (Hair *et al*, 1995). In empirical researches, the validity of a construct is examined in aspects of convergence and discriminates.

Convergent validity concern about how the measures tap the facets of construct. This validity is examined by looking at the individual item loading, composite reliability and variance-extracted measure for each construct. Composite reliability is measure of internal consistency of the construct indicators; an acceptable value should exceed 0.7 (Hair *et al*, 1995). The variance-extracted measure reflects the overall amount of variance that the indicators accounted for by the latent construct; these values for each construct should be exceed 0.5 (Hair *et al,* 1995). These indexes are calculated by standard loading for each construct indicator and its measurement error (ε_j)[1] as shown in E.q. 3.1 and 3.2.

$$\text{Composite validity} = \frac{(\sum \text{std.loading})^2}{(\sum \text{std.loading})^2 + \sum \varepsilon_j} \qquad (3.1)$$

$$\text{Variance extracted} = \frac{\sum \text{std.loading}^2}{\sum \text{std.loading}^2 + \sum \varepsilon_j} \qquad (3.2)$$

Discriminant validity concerns about how the constructs distinct from each other. Discriminant validity of constructs will be evaluated though intercorelations among latent constructs. If the intercorelations are significant high, it is possible that the constructs are

[1] Indicator measure error can be calculated as 1- (standardized loading)^2 (Hair *at el*, 1995).

not different from each other. For further discriminant analysis may performed by one of two approaches. One procedure is recommended by Bagozzi *et all.,*(1991) and this method was applied in several studies (Olsen, 2001, 2005, 2007). According to Bagozzi *et all* (1991) suggestion, the pairs of constructs within each subset of measures are examined in a series of two-factor and one-factor confirmatory factor model. A number of indexes such as the chi-square, RMSEA of two-factor and one-factor model are considered to compare model fit. Another approach is suggested by Fornell and Larcker (1981). It is recommended that if the average variance extracted from two constructs is higher than the square of correlation between them, the discriminant validity exists.

3.3.4.Structural equation modeling

Once the convergent and discriminant validity are confirmed by measurement models, structural models are estimated to test the causal relations as presented in figure 2.1. SEM can use correlation or covariance/variance matrix as its input in constructing the model. A correlation matrix concerns about the relation pattern while variance/covariance matrix considers total exploration. The variance/covariance matrix used as input is appropriate to test a theory (Hair *et al,* 1995). In addition, choice of polychoric correlation is appropriate in the case of ordinal variables. Maximum likelihood (ML) will be applied and variance of indicators will be fixed to unity.

Significance of coefficient estimated in structural model will be evaluated through test of t-value (significant at 1.98) or p-value (at 5%). In addition, an overall coefficient of determination (R^2) is also calculated, this is measure of the proportion of the variance of the dependent variable about its mean that explained by predictor variables.

Confirmatory factor analysis and structural models are achieved by Amos 6.0 packages. Overal model fit (measurement and construct model) is assessed by number of index. Chi-square (χ^2) is traditional test for discrepancy between sample covariance matrix and population covariance matrix. However, this criteria has been recognized to be sensitive with sample size so that it should be used as quickly overview of model fit (Byrne, 2001). Amos 6.0 can report a number of alternative indexes of fit: Root mean square residual (RMR); goodness-of-fit index (GFI), normed fit index (NFI), comparative fit index (CFI), root mean square error of approximation (RMSEA). Acceptable model fit

are indicate by RMR and RMSEA values below 0.08, and GFI, NFU and CFI value exceeding 0.90 (Byrne, 2001). This study will use the value of Chi-square, RMSEA, and CFI as criterion to examine the Goodness of Fit of the models.

4. Results

This part begins with exploratory factor analysis and reliability test for the measures. Factor loadings of items are extracted associated with sub-latent constructs, and then Cronbach's alphas are calculated for the most reliable measures. The factor loadings of items and Cronbach's alpha are used to consider the suitability of the indicators in describing the latent factors in question. The items have low factor loadings or have cross-loadings on other factors should not be considered as suitable indicator for the factor in question (Hair *et al*, 1995).

Once the latent constructs are defined and their reliabilities are confirmed, the study will perform descriptive analysis according to these constructs. Descriptive analysis is achieved to explore distributions and means of the measures. In addition, the study performs tests of mean difference of item scores among demographic or economics groups.

The last process is to test causal models by SEM through two steps (Anderson & Gerbing, 1988). According to Hair *et al* (1995), Cronbach's alpha is only indicative to the existence of unidimensionality of multiple-indicators rather the reliability of the constructs. Thus, confirmatory factor analysis is performed to re-examine more stringently the convergent and discriminant validity of each construct within proposed models. Composite reliability and variance-extracted scores of constructs are calculated and used to test the reliability. Once convergent and discriminant validity of constructs are confirmed, the structural models are estimated to test the hypothesis of relationships.

4.1. Exploratory factor analysis and reliability test

The exploratory factor analysis (EFA) and reliability test are performed firstly for the items within TPB model, the attribute beliefs, and then for other constructs. The appropriateness of EFA may be checked by number of methods such as visual inspection of inter-correlations among items, Bartlett tests for presence of nonzero correlations, or test of Measure of Sampling Adequacy (MSA) (Hair *et al,* 1995). The study found that the inter-correlations among items within EFA models were almost significant at 0.001 level (see appendix 1, 2, and 3). Bartlett tests were significant at 0.001 and MSA index were all

within accepted level of above 0.7 (Hair *et al*, 1995). Factor analysis is appropriately applied for the pools of items.

4.1.1. Constructs within TPB model

An exploratory factor analysis for constructs within TPB model involves 14 items, in which 5 items are regarded to attitudes, 3 items of every construct of norms, intention, and control. Factor loadings of items, explained variance and Cronbach's alpha of the constructs are presented in table 4.1.

Table 4.1: Factor loadings, explained variance and Cronbach's alpha of TPB constructs

	Attitude	Norms	Intention	Control
Unpleasant/pleasant	**,903**			
Dull/exciting	**,877**			
Unsatisfied /satisfied	**,874**			
Negative/positive	**,854**			
Bad/good	**,805**			
Important people expect me		**,923**		
My family want me		**,894**		
Important people want me		**,888**		
I plan to eat fish			**,873**	
I am going to eat fish			**,801**	
I expect to eat fish			**,762**	
For me eating fish is easy / difficult				**,822**
Personal control I feel over eating fish				**,822**
If I wanted, I could eat fish tomorrow				**,785**
Cronbach's alpha	**,956**	**,923**	**,861**	**0.823**
Explained variance (%)	**29,817**	**18,945**	**16,935**	**16,225**
Cumulative explained variance (%)	**29,817**	**48,762**	**65,697**	**81,921**
MSA=0.878; Bartlett test < 0.001				

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

The results in table 4.1 shows that factor loadings of items are all greater than 0.8, except the item of "I expect to eat fish in 3 days" (0.762) of intention, and "If I wanted, I could easily eat fish tomorrow" (0.785) of control. The Cronbach's alpha of attitudes and

norms are greater than 0.9, and of intention and control are greater than 0.8. The indexes of reliability are exceeding far than recommended level of 0.7 (Hair *et al,* 1995).

The high factor loadings indicate that the measures describe the same factor (e.g. convergent validity), whereas high Cronbach's alphas show the high inter-correlations among these items. In other word, the items used in this study are suitable to describe the construct of attitude, norm, intention, and personal control. The four factors explain for 82% of the variance in the data.

4.1.2. Attribute beliefs

The twenty-two items related to fish attribute beliefs were used, and 7 factors were extracted. Except from the constructs of convenience, other constructs are extracted from the data as expected. The EFA shows that the 6 items related to convenience attributes describe the two different latent constructs. Two sub-components of convenience are extracted as "suitable to dishes" (or suitability) and "consuming time" (or time). *Suitable to dishes* refer to individual's evaluations that fish can be cooked in many ways, and prepared for many dishes, and stored well. *Consuming time* reflects the individual's evaluation whether it is consumed much time to cook and prepare fish as meal.

Table 4.2 presents factor loading of items, explained variance and Cronbach's alpha for 7 latent constructs. Seven factors explored are:

(1) *Suitability or suitable to dishes* (factor 1) includes four items regarded to evaluation of fish suitable to cook, and prepare and store for many dishes in different occasions. The factor loadings of items are high, greater than 0.6; the Cronbach's alpha (0.745) is within accepted level. The four items are suitable to describe the construct.

(2) *Negative effect* (factor 2) includes three items related to unpleasant bones (2 items) and unpleasant smell. The two items regarded to bones have significant high of factor loading of around 0.9; the item of "unpleasant smell" has little lower loadings of 0.89. The Cronbach's alpha (0.836) is far above the suggested level. These items related to bones and smell are suitable to describe the negative effects

(3) *Perceived value* (factor 3) includes four items that express the perceived price and cost of consuming fish. The item "it's economical" has lowest factor loading (0.599).

In addition, Cronbach alpha of perceived value will be improved from 0.726 to 0.78 when the item of "it's economical'' is removed. In other words, three items of "not expensive", "suitable fro my budget", and "good value for money" are better representative for perceived value. This conclusion is also supported by descriptive analysis of items below.

Table 4.2: Factor loadings, explained variance, & Cronbach alpha of attribute constructs

	Suitable	Negative	Value	Quality	Time	Available	Health
Un/suitable to prepare many dishes	**,787**						
Un/suitable to cook many ways	**,730**						
Difficult/easy to store	**,668**						
Un/suitable to cook delicious [illegible]	**,604**						
Not/appealing to children	,444		,211	,211			,432
Unpleasant bones		**,907**					
Difficult to remove bones out		**,892**					
Unpleasant smell		**,786**					
Not expensive			**,822**				
Suitable for my budget			**,741**				
Good value for money			**,612**				
It's economical			**,599**				
Bad / good taste				**,803**			
Bad / good texture				**,798**			
Bad/good appearance				**,699**			
Much time / fast to cook					**,821**		
Much time / fast to prepare					**,806**		
Unavailable/available						**,848**	
Difficult/easy to buy						**,781**	
Not nutritious / nutritious						,352	**,721**
Unsuitable/suitable to elderly					,363		,672
Unhealthy / healthy				,414			**,608**
Cronbach's alpha	**0.745**	**0.836**	**0.726**	**0.741**	**0.857**	**0.737**	**0.556**
Explained variance (%)	**11,46**	**10,55**	**10,50**	**10,46**	**8,61**	**8,32**	**7,61**
Cumulative explained [illegible]	**11,46**	**22,01**	**32,51**	**42,97**	**51,58**	**59,89**	**67,51**

MSA=0.755; Bartlett test < 0.001

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

(4) *Perceived quality (*factor 4) includes three items related to taste, appearance, and texture. The results confirm that these items, which are mentioned as very important attributes indicating perceived quality in seafood context, are suitable to describe the concept of perceived quality. The loadings of items are equal or higher 0.7, and reliability index is above suggested level of 0.7.

(5) *Consuming Time* (factor 5) involves two items refer to evaluation of time consumed to cook and prepare fish as meal. The loadings of items are greater than 0.8, and Cronbach's alpha (0.857) is far above suggested level. The two items appear suitably to represent the construct of time

(6) *Availability* (factor 6) involves two items related to judgments of fish is unavailable/available and difficult/easy to buy. The items have high loading of 0.848 and 0.781, respectively, and Cronbach alpha (0.74) is within accepted level. Two items are suitable to describe the construct of availability.

(7) *Healthiness* (factor 7) was measured by two items regarded to judgments of fish as meal is "unhealthy/healthy" and "not nutritious/nutritious". The items have high loadings, 0.721 for "not nutritious/nutritious" and 0.608 for "unhealthy/healthy". However, the Cronbach alpha is too low (0.556) to indicate the reliability of the construct. In addition, the item of "unsuitable/suitable to elderly" has high loading on this factor although the items are not as same meaning. The findings in descriptive analysis below also suggest that the healthiness's construct should not be used for further analysis (e.g. testing the casual model).

The items of "not appealing/appealing to children" and "unsuitable/suitable to elderly" have high loading on two different factors, and Cronbach's alpha of these two items is very low at 0.444. The finding indicates that two items must be treated as indicators of different factors.

In sum, there are 7 factors extracted from present data. These 7 factors explain for 67.5 of variance in the data. The analysis shows that six factors regarded to suitability, negative effect, value, quality, time and availability are highly reliable and can be used for further analysis.

4.1.3. Other constructs

The exploratory factor analysis was performed by including 12 items related to involvement of eating seafood, health consciousness, knowledge, and habit of eating fish. The table 4.3 shows the factor loadings, explained variance and Cronbach's alpha of the constructs.

Table 4.3: Factor loadings, explained variance, and Cronbach alpha of other constructs

	Seafood Involvement	Health Consciousne	Knowledge	Habit
Fish is an important part of my diet	**,855**			
Fish means a lot to me	**,824**			
I care a lot about fish	**,748**			
My family has habit of eating fish	,550			,445
I'm concerned about the long-term		**,819**		
I'm a health-conscious person		**,716**		
I'm the most health-conscious person in		**,638**		
Varying dishes of meal is important to	,327	**,585**		
I have knowledge to evaluate fish quality			**,898**	
I have a lot of experiences related to fish			**,842**	
I am used to eat fish from my childhood				**,860**
Eating fish belongs to my weekly routine	,556			**,604**
Cronbach alpha	**,853**	**,719**	**,850**	**,611**
Explained variance (%)	**23,824**	**19,061**	**15,090**	**12,126**
Cumulative explained variance (%)	**23,824**	**42,884**	**57,975**	**70,101**
MSA=0.825; Bartlett test < 0.000				

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Three items designed to measure seafood involvement appear highly convergent and reliable to represent the construct. The factor loadings of items above 0.7, and Cronbach alpha is significant high of 0.853. Similarly, the two items of knowledge have high factor loadings of above 0.8, and Cronbach alpha is significant high at 0.85. The items are suitable to describe the constructs of knowledge.

The construct regarded to general health consciousness involves 4 items. They have high factor loadings except the item of "varying dishes of meal is important to me" (0.585). In addition, this item has moderate loading in the first factor. When this item was deleted the Cronbach's alpha decreased slightly from 0.719 to 0.708. It is possible to

remove the item of "varying dishes of meal is important to me" from the construct. The remained three items are suitable to describe the construct of health consciousness.

The item "My family has habit of eating fish" of habit construct has a high cross-loading in factor 1. This indicates that the item is not convergent with other items in describing the habit concept. The remain items "I am used to eat fish from my childhood" and "Eating fish belongs to my weekly routine" have high factor loadings, but the Cronbach's alpha is low, less than critical level of 0.7. Low Cronbach's alpha and high factor loadings indicate low correlations among items, but high convergent validity of the items within the construct.

4.2. Descriptive analysis

4.2.1. Fish consumption in Bacninh province

Fish consumption behavior is assessed by the self-reported frequency of past behavior. The respondents were asked to report the number of times on average during the last year they consumed fish as meal at home and away from home. The results of ten alternatives of answers are presented in the table 4.4.

Table 4.4: Assessment of fish consumption frequency

	2 times a day	1 time a day	5-6 times a week	3 - 4 time a week	2 time a week	1 time a week	2 - 3 time a month	1time a month	Severl time a year	Never	
	%										**Avg. (1-10)**
	10	9	8	7	6	5	4	3	2	1	
At home	2,4	1,4	5,7	19,6	37,8	17,2	10,0	2,9	1,4	1,4	5,9
Away from home	0,0	0,0	1,0	1,0	6,8	8,4	15,2	7,3	42,4	17,8	2,9

As listed in the table 4.4, people eat fish at home is much higher frequency than this consumption away from home. The responses for "at home" have score of 5.9 compared to only 2.9 for "away from home". On average, the people in the area eat fish one time a week at home and only several times a year away from home. The result is significant at 1%, (t-value of test mean equal to 5.0 and 2.0 are 9.56 and 7.52, respectively).

The distribution of responses for "eating fish at home" centered in categories of 4-7. Across the ten-point scale, this indicates a normal path of the data. About 82% respondents reported that they eat fish at least one time a week at home, and the respondents eating fish at home twice a week (score of 6.0) are dominated, accounting for 37.8% of the sample.

The scores of "eating fish away from home" distribute mainly on 1 and 2 categories. Never or several time a year eating fish away from home is dominated by 60% respondents. It also indicates that the data does not have a normal distribution across 10-point scale.

Table 4.5: T-test of mean difference between groups for fish consumption

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
At home	0,19	0,40	0,32	0,15	0,36	0,11	-0,24	0,27
Away from home	-0,47	0,06	0,77	0,00	1,06	0,00	-0,13	0,61

T-tests of mean difference for the consumption frequency between groups are resulted in table 4.5. As shown in the table, there is not any significant difference in fish consumption frequency at home between male and female, family with children and without children, single and married person, people in rural and urban area.

However, it is found significant differences of mean in score of "eating fish away from home" between groups of family with children and without children, and between single and married individuals. People who do not have children and who are single consume fish away from home more frequency than those of people who have children and who are married. The results are significant at 1% level. At significant of 6% level, it is found that the males eat fish away from home more frequency than those of females. The people who are in rural area do not differ from urban people in eating fish way from home.

The study also performed ANOVA to test mean difference of eating fish frequency among income groups, and age groups. The results in table 4.6 show the mean differences in score of "eating fish at home" were not found significantly among groups of age, and among groups of income. The F-values are 0.323 (p= 0.809) and 0.494 (p=0.611) for age and income groups, respectively. However, the differences among these groups are found in score of "eating fish way from home", F value of 3.0 and 5.75 for age and income

groups, respectively. A post-hoc test shows that people who are less than 25 years consuming fish away from home more than those of people who are in range of 41-55 years, significant at 5% level. Respondents who have income more than 4 millions VND consume fish way from home than those who have income less than 4 millions. The differences are significant at 1% level.

Table 4.6: ANOVA of mean difference between age and income group

	Age Group	Mean Difference	p-value		Age Group	Mean Difference	p-value
Times eating fish at home (F = .323, p=.809)	< 25 -- 25-40	,217	,779	**Times eating fish away from home (F= 3.00; p = 0.032)**	< 25 -- 25-40	,261	,716
	< 25 -- 41-55	,205	,899		< 25 -- 41-55	,916(*)	,023
	< 25 -- > 55	,070	1,000		< 25 -- > 55	1,105	,740
	25-40 -- 41-55	-,012	1,000		25-40 -- 41-55	,655	,107
	25-40 -- > 55	-,147	,999		25-40 -- > 55	,844	,862
	41-55 -- > 55	-,135	,999		41-55 -- > 55	,189	,998
Times eating fish at home (F =.494, p=.611)	Income Group	Mean Difference	p-value	**Times eating fish away from home (F=5,75 ; p =.004)**	Income Group	Mean Difference	p-value
	< 2 mill - 2-4 mill	-,211	,617		< 2 mill - 2-4 mill	-,184	,728
	< 2 mill -> 4 mill	-,050	,982		< 2 mill -- > 4 mill	-,975(*)	,004
	2-4 mill-> 4 mil	,161	,806		2-4 mill- > 4 mil	-,791(*)	,013

* The mean difference is significant at the .05 level

ANOVA for family-size group also found no difference in frequency of eating fish at home as well as way from home. F value is 1.01 (p=0.37) and 1.62 (p=0.2) for item "at home" and "away from home", respectively. The results are not presented in the table 4.5.

4.2.2 Intention for fish consumption

The study measured intention as motivation toward fish consumption of individuals through three items expressing by "plan, expect, and will". The respondents were asked to indicate "how likely" they plan/expect/will eat fish in three days in a 7-point scale. The table 4.7 shows a full description of the results.

Table 4.7: Assessment of intention to eat fish in three days

	Very unlikely			**%**			**Very likely**	**Avg.**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
I plan to eat	12,0	4,8	9,6	12,4	18,7	11,0	31,6	4,9
I expect to eat	8,6	4,8	5,7	17,7	14,4	23,0	25,8	5,0
I will eat	14,8	5,7	6,2	10,5	16,3	15,8	30,6	4,9

The results from the survey show that people in the area are moderately likely in intention to eat fish in three days. The average scores of three items are around 5.0. The distributions of the scores across three items are concentrated on 4 (neutral point) and above 4 categories. The respondents who have strongly intention (score at 7) to eat fish in three days dominated in every item. More than 60% of respondents reported they plan, expect, and will eat fish in three days. The results appear to be consistent among of items.

Table 4.8 presents results of t-test of mean difference between groups of gender, children, marital status, and area. The mean differences in score of intention's items among the groups are not found significantly at 5% level.

Table 4.8: T-test of mean difference among groups response to intention items

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
I plan to eat fish	0,17	0,58	-0,13	0,06	0,56	0,67	-0,01	0,96
I expect to eat fish	0,34	0,22	0,11	0,50	0,18	0,70	0,31	0,25
I will eat fish	0,59	0,06	-0,33	0,51	-0,21	0,31	-0,34	0,27

More strictly, it was found significant differences at 6% level within "gender" groups in score of item "will" and among "children" group in score of item "plan".

ANOVA for mean difference among income groups resulted no significant difference in scores of items "plan" and "expect". Only a significant difference in responses of item "will" was found at 1% level. Post-hoc test revealed that the difference was among groups of income less than 1 millions VND and in range of 1-2 millions. ANOVA for mean difference between age group and between family-size groups also confirmed no any significant differences of means in score across three items designed to measure intention.

4.2.3. Global attitude

Five items were designed to assess directly attitudes toward fish consumption. These items reflect satisfaction, general attitude, and general evaluation were presented in a scale from 1 to 7. The table 4.9 shows the full description of results.

Table 4.9: Assessment of global attitude toward fish consumption

	%							Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Bad/good	1,9	1,4	1,0	8,1	14,8	24,9	47,8	6,0
Unsatisfied/satisfied	3,3	1,0	3,8	11,5	18,7	26,3	35,4	5,6
Unpleasant/pleasant	2,4	1,9	2,9	7,7	19,2	26,4	39,4	5,8
Dull/exciting	2,9	1,9	2,4	10,5	25,4	23,0	34,0	5,6
Negative/positive	3,3	1,9	2,4	12,9	16,3	27,8	35,4	5,6

As showed in table 4.9, people in the area have very positive attitude toward eating fish, providing an average score of items in range of 5.6 to 6.0. The respondents who rated fish in form of meal as extremely good/positive feelings, satisfactory, pleasance, and excitement (score of 7.0) are dominated, accounting for more than one-third of the sample. The sample shows only small proportion of respondents (less than 10%) have negative attitude toward fish consumption across five items.

T-test of mean difference among groups is resulted in table 4.10. Female and male ranked not differently across the items designed to measure general attitude toward fish consumption. Significant differences at 5% level among groups of "children" in score of items "bad/good" and "dull/exciting" were found. Respondents without children rated more positive for these items than those who have children. The differences among "marital" groups and among "area" groups in rank of the items were not found significantly at 5% level.

Table 4.10: T-test of mean difference among groups response to attitude items

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Bad-Good	0,10	0,60	0,43	*0,03*	0,37	0,06	-0,14	0,50
Satisfied	0,21	0,32	0,27	0,23	0,23	0,31	-0,05	0,82
Pleasant	0,06	0,78	0,36	0,09	0,22	0,30	0,01	0,97
Exciting	0,13	0,55	0,42	*0,05*	0,25	0,24	0,09	0,68
Negative-positive	0,18	0,42	0,34	0,13	0,38	0,09	0,16	0,46

ANOVA among age and among income groups were also performed. It is resulted that no differences within age groups as well as income groups at significant of 5% level across five items. F-values of mean difference test for age groups are less than 0.4, and less than 1.9 for income groups.

4.2.4. Social norms and expectation

Social norms are defined as social pressure and family expectation on motivation toward fish consumption. The concept was assessed by three items of "who are important to me want/expect me eating fish regularly" and "my family want me eating fish regularly". The results of assessment are showed in table 4.11.

Table 4.11: Assessment of social norms on eating fish

	%							Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Important expect	3,3	3,8	5,7	18,7	26,3	23,9	18,2	5,1
Family want	2,4	2,4	8,6	17,2	18,2	28,7	22,5	5,2
Important want	2,4	2,4	6,7	15,8	24,9	27,3	20,6	5,2

Family expectation toward eating fish is reported highly, providing an average score of 5.2. The "important want" and "important expect" scores are rather similar, receiving an average score around of 5.2. It shows clearly that social norms and family expectation are scored quite positively; around 70% respondents ranked the norms having positive impact on eating fish.

In addition, the scores of social norms and family expectation on fish consumption are very consistent among three items. The table 4.12 shows that there are no differences of mean among groups response to three social norm items at significant of 1% level.

Table 4.12: T-test of mean difference among groups response to norm items

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Important want	-0,16	0,47	0,03	0,89	-0,16	0,49	-0,04	0,87
Family expect	-0,01	0,96	0,21	0,36	-0,08	0,72	0,06	0,77
Important expect	-0,05	0,80	0,30	0,18	-0,17	0,44	-0,09	0,67

As similar as t-test, ANOVA tests of mean difference among age, income, and among family size groups in score of the items show that the results are not significant at 1% level. In another word, the respondents among each group were consistent in score of influence of social norms and family expectation toward eating fish.

4.2.5. Personal control over fish consumption

Perceived behavior control or personal control is defined as the perception of individuals on ease or difficulties to perform a behavioral intention (e.g. eating fish). The

construct was measured by three items of "How much personal control you feel you have over eating fish", "For me to eat fish is", and "If I wanted to, I could easily eat fish tomorrow".

As listed in table 4.13, the scores across the items are rather different. The item "if I wanted" received a highest average score of 5.3, and the distribution center on 5, 6, and 7 categories, while the item "personal control" and second "for me eating fish" get nearly neutral score, 4.1 and 4.6 respectively. The score's distributions of two first items concentrate mainly on neutral point (4.0), accounting for more than half of respondents.

Table 4.13: Assessment of general personal control over fish consumption

	Very unlikely			%			Very likely	**Avg.**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Personal control over eating fish	2,9	3,3	10,5	63,6	9,6	1,9	8,1	4,1
For me eating fish is easy / difficult	1,9	1,9	3,8	51,4	21,6	10,6	8,7	4,6
If I wanted, I can easily eat fish tomorrow	2,9	1,9	3,8	8,1	41,6	19,6	22,0	5,3

The results of t-test for mean difference among groups in table 4.14 show that only male and female score differently on item of "personal control you feel". The difference is significant at 5% level.

Table 4.14: T-test of mean difference among groups response to control items

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Personal control	0,38	0,03	0,19	0,49	-0,12	0,31	-0,28	0,11
For me eating fish	0,07	0,70	0,28	0,50	0,12	0,13	-0,04	0,83
If I wanted	0,02	0,92	0,15	0,21	0,25	0,47	-0,20	0,31

ANOVA was also performed to test mean difference among groups of income, age, and family size. It is found that the respondents within 41-55 years and above 55 years rate differently item of "For me eating fish"; and people having income less than 1 millions and within 1-2 millions rank item of "personal control" differently. The results are significant at 5% level.

4.3. Assessment of specific beliefs

Within TRA and TPB, predictors of behavior and intention can be assessed by the salient beliefs. A person holds many salient beliefs toward an object or behavior. In

marketing literature, salient beliefs toward an object (e.g. product) are assessed by its attribute beliefs. The study considers the attribute beliefs of the product (e.g. fish product) as major determinants of attitude and control toward the behavior (e.g. fish consumption).

Attribute beliefs toward fish product are assessed by a number of items. The exploratory analysis extracted 7 groups of attribute beliefs that are suitability, negative effect, perceived value, perceived quality, time, availability, and healthiness. Descriptive analysis and mean difference tests following are achieved respect to these results.

4.3.1. Suitable to dishes

Suitable to dishes is defined and assessed by four items that are regarded to judgments that fish can be cooked and prepared for variety of meals and related to preservation. Table 4.15 presents full description of the assessment.

Table 4.15: Assessment of perceived suitability of fish to many dishes

	Totally Disagree			%			Totally Agree	**Avg.**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Unsuitable/suitable to prepare many dishes	1,4	4,8	4,3	13,9	19,1	25,4	31,1	5,4
Unsuitable/suitable to cook in many ways	0,5	2,9	1,9	10,5	23,0	31,1	30,1	5,7
Difficult/easy to store	4,8	9,1	18,2	18,2	24,4	17,2	8,1	4,3
Unsuitable/suitable to cook delicious meals	4,3	5,7	7,2	12,0	23,9	25,8	21,1	5,1

As the results shown, item of "unsuitable/suitable to cook in many ways" has the highest average score, providing an average score of 5.7. The items of "Unsuitable/suitable to prepare many dishes" and "to cook for delicious meals" are similar, the average scores above 5.0. The distribution of three items (e.g. fish suitable to cook/prepare many and delicious meals) concentrates on positive dimension. The neutral and positive scores account for around 90% of respondents.

The item "difficult/easy to store" get the lowest score than other items, an average score is only 4.3. The score of the item distributes centrally on range of 3-6 categories. The judgment regarded to ability of being stored of fish seems to be received an ambivalence response. This item seem to reflect a different in meaning from other items. Therefore, item of "difficult/easy to store" will not be used in causal model test.

As listed in table 4.16, only item of "unsuitable/suitable to cook in many ways" received a mean difference of score between single and married person. The single

respondents rated this attribute higher than those of married person. The result is significant at 5% level.

Table 4.16: T-test of mean difference among groups response to suitability

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Prepare for many dishes	0,20	0,36	-0,23	0,32	0,12	0,59	0,04	0,85
Cook in many ways	-0,07	0,72	0,05	0,78	0,38	0,04	0,12	0,52
Difficult/easy to store	-0,23	0,33	-0,06	0,79	0,14	0,54	-0,28	0,23
Cook for delicious meals	0,14	0,56	0,25	0,32	-0,11	0,65	-0,05	0,84

4.3.2. Negative effects

Unpleasant bone and smells of fish are recognized as having negative effect on attitude toward the consumers (Olsen, 2001; 2004). These attributes were assessed by three items as listed in table 4.17. The results show that a high agreement of respondents for judgment that bone and smell of fish are unpleasant. Unpleasant bones received higher agreement than those of unpleasant smell, providing average scores of around 5.0 for bones and 4.5 for smell.

Table 4.17: Assessment of negative effects of fish as meal

	Totally Disagree			%			Totally Agree	**Avg.**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
The bones in fish are unpleasant	4,3	7,2	8,7	11,1	21,6	23,1	24,0	5,0
Removing all bones out of fish is difficult	3,4	8,7	8,2	13,9	22,1	24,0	19,7	4,9
Fish has an unpleasant smell	3,8	12,0	12,0	17,3	23,1	15,9	15,9	4,5

Concerning to the distribution, the scores of bones (e.g. unpleasant bones and removing all bones) centered on 4, 5, 6, 7 categories whereas the score of smell spread from 2 to 7. About 70% of respondents agreed with the judgments of two items indicating (negative) bones, while there was a moderately ambivalence in rank of "unpleasant smell".

Table 4.18: T-test of mean difference among groups response to negative effects

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Unpleasant bones	0,07	0,79	-0,06	0,82	0,10	0,70	0,31	0,22
Difficult to remove bone	0,19	0,45	0,08	0,77	0,04	0,89	0,26	0,30
Unpleasant smell	0,11	0,66	-0,05	0,86	0,12	0,66	0,10	0,70

T-tests of mean difference found a consistence among groups in rate of bone as well as and smell attributes. As shown in table 4.18, the difference of means across items among gender, children, marital, and area groups are not found significantly.

4.3.3. Perceived value

Perceived value was measured by four items reflect the individual's perception of price and cost in consuming fish. Full results of measures are listed in table 4.19.

Table 4.19: Assessment of perceived value of fish as meal

	Totally Disagree			%			Totally Agree	**Avg.**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Not expensive	3,3	3,8	3,8	18,2	23,4	23,9	23,4	5,2
Suitable for my budget	4,3	3,4	8,2	26,0	22,6	20,2	15,4	4,8
It's economical	7,7	10,6	15,5	25,6	16,4	16,4	7,7	4,1
Good value for money	1,9	2,4	3,3	12,0	23,4	31,1	25,8	5,5

The results show that consumers rated fish as good value for money highly as indicated in the table 4.19, providing an average score of 5.5. The evaluation of item of "Not expensive" is rather similar, an average score of 5.2. These two items also have a similar distribution, the scores concentrate on range of 5 to 7. More than 70% respondents rate that fish is not expensive and good value for money.

The item of "suitable for my budget" was evaluated moderately lower, receiving an average score of 4.8. The scores of the item center on 4, 5, and 6 categories. About 60% respondents rate fish suitable to their budgets, 26% response a neutral score (4.0), and only 14% do not agree with the judgment.

The respondents appeared to be very ambivalent in rate of item of "it's economical", providing an average score at nearly neutral point of 4.1. The distribution of the score also indicates a normal path; the score is peak at 4.0 and decreases gradually in both sides. However, item of "it's economical" had lowest factor loading as shown in table 4.2, and if the item was deleted the level of construct reliability is improved moderately. We decided to remove the item "it's economical" from the further analysis.

The results of t-test of mean difference in table 4.20 show that at significant 5% level, respondents among groups of gender, children, marital and areas evaluate indifferently across the four items. Considered more strictly, item of "it's economical" was

evaluated differently between male and female at significant 7% level; the item of "good value" is received different evaluations between group having children and without children, significant at 8%.

Table 4.20: T-test of mean difference among groups response to perceived value

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Not expensive	0,15	0,50	0,26	0,27	0,36	0,12	-0,02	0,94
Suitable for my budget	-0,34	0,14	0,38	0,11	0,27	0,25	-0,08	0,73
It's economical	-0,44	0,07	0,15	0,56	0,23	0,37	0,18	0,47
Good value for money	-0,28	0,16	0,37	0,08	0,17	0,41	-0,09	0,65

4.3.4. Perceived quality

According to Peter and Hans (1995), quality of a product may be evaluated through its cues and attributes. In seafood context, taste, texture, and appearance are considered as major indicators of perceived quality (Olsen, 2004). The assessment of perceived quality of fish through these attributes and cues are resulted in table 4.21.

Table 4.21: Assessment of perceived quality of fish as meal

	Very bad			%			Very good	Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Bad / good taste	1,9	1,9	0,5	4,8	18,8	39,4	32,7	5,9
Bad/good texture	1,9	2,9	8,6	19,1	33,0	23,4	11,0	4,9
Bad / good appearance	1,4	0,5	1,4	12,0	27,8	36,4	20,6	5,6

The respondent rated taste of fish as rather good, providing an average score of 5.9. The appearance attribute was received a similar evaluation, getting an average score of 5.6. The attributes of taste and appearance also have similar score's distribution that concentrate in range of 5, 6, and 7 categories. Around 90% respondents ranked fish as meal having good taste and good appearance.

Texture was evaluated rather lower than those of taste and appearance; the average score for texture is of only 4.9. The distribution of the item score concentrates on 4, 5, and 6 categories.

T-test of mean difference in table 4.22 shows that only single person and married person evaluated differently texture with significance at 2%. More strictly, we find a

significant difference at 6% level between respondents having children and without children in evaluating appearance.

Table 4.22: T-test of mean difference among groups response to perceived quality

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Taste	-0,17	0,33	0,27	0,14	0,28	0,12	0,01	0,97
Texture	0,07	0,72	0,31	0,12	0,45	0,02	-0,22	0,25
Appearance	-0,09	0,59	0,33	0,06	0,05	0,79	-0,18	0,28

4.3.5. Convenience

Convenience is a complex concept in marketing perspective, especially in food context (Gofton, 1995). In order to measure the concept the study used a number of items that involve several aspects of convenience. A factor analysis figured out that times consumed to cook and prepare fish as meal are perceived as an independent factor. The two items combining to assess convenience in term of consuming time are presented in table 4.23.

Table 4.23: Assessment of perceived time to cook/prepare fish as meal

	Very bad			%			Very good	Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Much time/fast to cook fish	0,5	6,2	11,5	20,6	33,5	21,1	6,7	4,7
Much time/fast to prepare fish	1,9	7,7	10,5	19,1	36,8	18,7	5,3	4,6

As seen in the table 4.23, respondents evaluated time used to cook and prepare fish as not a constraint, with average scores of 4.7 and 4.6 respectively. The score of two items also have a similar distribution, which one-third of respondents center on 5 of category.

Table 4.24: T-test of mean difference among groups response to perceived time uses

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Time to cook	-0,13	0,50	-0,02	0,90	0,36	0,05	0,16	0,40
Time to prepare	-0,02	0,93	-0,12	0,56	0,19	0,34	0,06	0,76

T-test also confirmed the consistence in evaluating times consuming to cook and prepare fish as meal among different groups. It wasn't found any significant difference of

mean in evaluating the two items among gender, children, marital and area group. Table 4.24 shows more detail of t-test results.

4.3.6. Availability

Availability is recognized to be an important factor influence the choice of seafood (Olsen, 2004). The construct was assessed by two items of "unavailable/available" and "difficult/easy to buy". The alternative choices anchor from very bad to very good.

Table 4.25: Assessment of perceived availability of fish

	Very bad			%			Very good	Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Unavailable / available	0,5	2,4	4,3	13,4	20,6	34,0	24,9	5,5
Difficult / easy to buy	0,5	1,0	1,4	7,7	20,1	31,6	37,8	5,9

The results in table 4.25 show that respondents evaluate the availability of fish as rather good, providing average scores of 5.5 for "unavailable/available" and of 5.9 for "difficult/easy to buy". The scores of the two items distribute centrally on 5, 6, and 7 categories. Nearly 80% respondents evaluated fish as available and about 90% rated fish as easy to buy.

The evaluations also were consistent among gender, children, marital, and area groups. As presented in table 4.26, it wasn't found any significant difference of mean in evaluating two items between male and female, respondent with children and without children, single and married person, and between people in rural and urban area.

Table 4.26: T-test of mean difference among groups response to availability

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Unavailable/available	-0,30	0,12	0,07	0,71	-0,05	0,80	-0,32	0,10
Difficult/easy to buy	0,06	0,74	-0,14	0,42	0,12	0,49	0,09	0,60

4.3.7. Healthiness and nutrition

Healthy attribute of fish was assessed by two items of "not nutritious/nutritious" and "unhealthy/healthy". Factor analysis and reliability test showed that these items

appeared not suitable to represent the healthy factor. A full description of two items presented in table 4.27 explore more detail the scores of items.

Table 4.27: Assessment of perceived healthiness of fish as meal

	Very bad			%			Very good	Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Not nutritious/nutritious	0,0	0,0	0,0	0,5	7,7	26,8	65,1	6,6
Unhealthy/healthy	0,0	1,0	0,5	1,4	5,7	25,4	66,0	6,5

The respondents rated fish as healthy and nutritious as extremely good, average scores of around 6.5 for each item. The respondents mainly rated two items at the categories of 6 and 7, accounting for more than 90% in each item. The distributions of items show a significant peak, Skewness value is -1.3 for "Not nutritious/nutritious" and -2.6 for "Unhealthy/healthy". The absolute ratios between Skewness and Standard Errors are extremely high, 29 and 44 respectively. This indicates a non-normal path that is not an expected distribution for multivariate analysis (Hair *et al*, 1995).

The results of t-test in table 4.28 show no significant difference in evaluating items of "Unhealthy/healthy" and "Not nutritious/nutritious" among demographic groups.

Table 4.28: T-test of mean difference among groups response to healthiness

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Not nutritious/nutritious	-0,14	0,15	-0,09	0,35	0,24	0,02	0,05	0,58
Unhealthy/healthy	-0,20	0,12	0,07	0,58	0,31	0,01	0,05	0,69

4.3.8. Appealing

The study defined and measured appealing attributes by two items of "Not appealing/appealing to children" and "Unsuitable/suitable to elderly". However, factor analysis and reliability test showed that the two items are not suitable to describe one factor, they belong to two different concepts.

As shown in the table 4.29, respondents rated fish suitable to elderly as rather high, providing average score of 5.4. The scores concentrate on positive evaluation, accounting for more than 70%. The evaluation of fish as appealing to children is not as good as fish suitable to elderly, an average score is only 4.9. The distribution of scores of

"not/appealing to children" concentrates on 4, 5, and 6 categories. About 60% respondent rated positive on item of "not appealing/appealing to children".

Table 4.29: Assessment of appealing to children and suitable to elderly of fish as meal

	Very bad			%			Very good	Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Unsuitable/ suitable to elderly	1,4	2,4	5,8	16,8	23,1	21,6	28,8	5,4
Not/appealing to children	1,5	2,9	11,2	22,8	27,2	20,9	13,6	4,9

The results of t-test in the table 4.30 shows no significant difference in evaluation of the two items among groups of gender, children, marital, and among area.

Table 4.30: T-test of mean difference among groups response to appealing items

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Un/suitable to elderly	-0,13	0,53	-0,30	0,16	0,12	0,58	0,35	0,10
Not/appealing children	-0,10	0,62	-0,18	0,39	-0,13	0,55	0,14	0,50

4.3.9. Assessment of other constructs

The four other constructs such as involvement, health consciousness, knowledge and habits of eating fish are assessed and presented in tables from 4.31 to 4.39. These constructs were assessed only in forms of frequency and mean difference test.

The involvement is defined as motivation toward fish consumption and assessed by three items as shown in table 4.31. The results show a high proportion of respondents who agreed that eating fish is important, and worthy to talk and concern. The averages of scores are around 5.8. The scores of three items concentrate highly on 5, 6 and 7 categories, these categories accounts for more than 70% of respondents in each item.

Table 4.31: Assessment of involvement

	Totally Disagree			%			Totally Agree	Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
Important part of my diet	1,0	1,9	2,9	10,5	15,3	31,1	37,3	5,8
Means a lot to me	2,4	1,0	3,8	9,1	24,0	31,7	27,9	5,6
I care a lot about fish	0,0	2,4	4,3	6,7	13,9	33,0	39,7	5,9

As presented table 4.32, respondent rated the involvement's items rather consistently. It was found no significant difference of mean in rank of items among demographic groups.

Table 4.32: T-test of mean difference among groups response to involvement items

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Important part of my diet	-0,18	0,36	0,16	0,40	-0,07	0,74	-0,12	0,55
Mean a lot to me	0,08	0,71	-0,11	0,61	-0,19	0,36	-0,31	0,12
Care a lot about	0,09	0,61	0,21	0,26	0,18	0,35	-0,24	0,19

The assessment of health consciousness is presented in table 4.33. The results show that respondent reported that they are quite high health-conscious. The average scores of four items are around 6.0. The distribution of score centers mainly on 6, and 7 categories**.**

Table 4.33: Assessment of health consciousness

	Totally Disagree			%			Totally Agree	**Avg.**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
I am a health-conscious person	0,0	0,5	2,9	6,3	12,0	23,6	54,8	6,2
Concerned the long-term effects of food to health	0,5	1,0	1,4	7,2	17,8	25,5	46,6	6,0
The most health-conscious person in family	3,4	2,4	5,3	9,6	20,7	26,0	32,7	5,5
Varying dishes of meal is important	0,0	2,4	2,9	7,7	11,5	22,6	52,9	6,1

As shown in table 4.34, only item of "varying dishes of meal" is reported significantly different between male and female, and item of "I am the most health-conscious person in family" has significant difference in response between single and marital person. The differences are significant at 1% level.

Table 4.34: T-test of mean difference among groups response to health consciousness

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig. Sig.	Mean Difference	Sig.	Mean Difference	Sig. Sig.
Health-conscious person	0,08	0,62	0,12	0,49	-0,01	0,94	-0,10	0,54
Long-term effects of food	-0,22	0,20	-0,12	0,50	0,00	0,99	-0,19	0,26
Most health-conscious person	0,18	0,43	-0,11	0,64	-0,71	0,00	-0,14	0,54
Varying dishes of meal	0,47	0,01	0,07	0,72	-0,03	0,89	0,06	0,75

The knowledge related to cooking, preparing and buying steps is assumed probably impact on attitude and motivation toward consuming fish. The construct is measured by two items as shown in table 4.35. The respondent reported that they have quite a lot of

knowledge related to fish as meal, average scores is 4.9 for first item and 4.7 for the second. The ranks of these items are similar, center mainly on 5 and 6 categories.

Table 4.35: Assessment of knowledge related to fish as meal

	Totally Disagree			%			Totally Agree	**Avg.**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
I have knowledge to evaluate fish quality	1,5	7,3	13,6	13,1	26,7	20,4	17,5	4,9
I have experiences related to fish	2,9	9,2	12,6	16,5	23,3	23,3	12,1	4,7

T-tests of mean difference also explored the consistence between the responses in score of knowledge's items. The results in table 4.36 show no significant difference of mean in rank of the items among demographic groups.

Table 4.36: T-test of mean difference among groups response to knowledge

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Know to evaluate quality	-0,27	0,25	0,08	0,74	-0,13	0,60	0,19	0,42
Experiences related to fish	-0,37	0,13	0,12	0,61	0,14	0,56	0,10	0,66

Habit is suggested to be important indicator of behavior in both social and marketing perspectives. This study assessed habit of eating fish by three items as shown in table 3.37. The results show that three items are rated highly; an average of score is around 5.3. It is noticeable that item of "Eating fish is my weekly routine" received the highest average score and distribution concentrates mainly on 7 categories, accounting for 40% respondents.

Table 3.37: Assessment of eating fish habit

	%							**Avg.**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**(1-7)**
From my childhood	3,4	5,3	8,2	15,9	20,3	20,3	26,6	5,1
My weekly routine	2,4	4,3	4,8	11,5	13,9	22,6	40,4	5,6
My family habit	2,9	3,8	5,8	12,5	21,2	26,4	27,4	5,3

Results in table 4.38 show that only item of "My weekly routine" received a significant difference of mean among rural and urban people. Other items are got consistent score among groups.

Table 4.38: T-test of mean difference among groups response to habits

	Gender (female-male)		Children (no-yes)		Marital (single-married)		Area (rural-urban)	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
From my childhood	-0,33	0,20	0,37	0,17	0,15	0,58	0,15	0,56
My weekly routine	0,08	0,75	0,30	0,25	0,10	0,69	-0,49	0,05
My family habit	-0,15	0,52	0,08	0,75	0,14	0,57	-0,06	0,80

In sum, a part from the items designed to measure the constructs of healthiness and appealing, the measures used in Western studies appeared high internal reliability and suitable for Vietnam situations. The consumers in the area consume fish at quite low frequency although they have great positive attitudes and high motivations toward the consumption.

4.4. Test of the conceptual model

The section has objective to understand the underlying relationships among factors that determine fish consumption behavior and motivation toward the behaviors. It includes a further investigation on what attributes are important in forming attitude and personal control toward eating fish. Two causal models as presented in Fig.2.1 are estimated by SEM. The basic model of TPB is estimated first and then the attribute model. The two-step approach that recommend by Anderson and Gerbing (1998) and used broadly in seafood studies (Olsen, 2001; 2003; 2007) are applied.

4.4.1. Confirmatory factor analysis of basic TPB model

The basic model of TPB involves five constructs as shown in Fig.2.1. A part from construct of consumption frequency including only one item, other constructs include at least 3 items. Initial confirmatory factor analysis of four factors was consisted of 14 items, in which attitude has 5 and each other factor has 3 items. The initial model produced good empirical results (e.g. RMSEA=0.064). However, the structural model estimated consequently had poor results of Goodness of Fit (e.g. RMSEA =0.095). We decided to remove some items to improve Goodness of Fit for structural model. The process resulted

in 1 item of attitude as "dull/exciting". Table 4.39 shows the Goodness of Fit of measurement model, composite reliability and extracted-variance score for the constructs.

The measurement model with 4 constructs exhibited a good fit. Apart from Chi-square, RMSEA (0.065) and CFI (0.971) are all far below or above advocated fit level of 0.08 and 0.90, respectively (Hair *et al*, 1995). Convergent validity of constructs is evaluated by number of criteria: standardized loading factors of each item in construct (Bagozzi, Yi, & Phillips, 1991); composite reliability and variance extracted scores of the constructs (Bagozzi & Yi, 1988). Composite reliability and variance-extracted scores are calculated according to equation of 3.1 and 3.2.

Table 4.39: Standardized CFA coefficient and reliability of TPB constructs

Constructs and indicators	Standardized Factor Loadings	t-value	Composite Reliability	Variance Extracted
Attitude			0,94	0,80
Bad - Good	0,849	(.000)[a]		
Unpleasant-pleasant	0,947	19,37		
Unsatisfied-satisfied	0,912	18,06		
Negative -positive	0,875	16,73		
SN			0,92	0,80
Family expect	0,86	(.000)[a]		
Others expect	0,918	17,91		
Others want	0,908	17,65		
PBC			0,82	0,60
Personal control	0,713	(.000)[a]		
If I wanted	0,82	9,88		
For me to eat fish	0,783	9,68		
Intention			0,86	0,67
Will	0,829	(.000)[a]		
Plan	0,855	13,21		
Expect	0,775	12,00		
Chi-square: 127,2; df=68; p < 0.0001; RMSEA= 0.065; CFI=0.971				

[a] *The value is not calculated because the parameter is fixed to 1.0*

As shown in table 4.39, the factor loadings of items are all high (above 0.7) and significant for all constructs. T-values associated with factor loadings are significant ($p<0.001$), ranging from 9.68 to 19.37. Composite reliability and variance-extracted scores of constructs all exceed the recommended level of 0.6 and 0.5, respectively, (Bagozzi & Yi, 1988; Hair *et al*, 1995). In another word, convergent validity of constructs is confirmed.

High correlations between latent constructs indicate a signal that the discriminate validity of constructs may be violated. It is found some high correlation between constructs as shown in table 4.40. It is noticeable that correlations between behavior and other constructs, especially with attitude, are very high. This may be caused by the measure errors that are mentioned in discussion part. To test the discriminant validity the study applied method recommended by Bagozzi *et al* (1991) in which pairs of constructs in series of two-factor confirmatory factor model are examined. The discriminant validity of constructs is confirmed if two-factor model is better Goodness of Fit than those of one-factor model.

Table 4.40: Inter-correlation among TPB constructs and two/one-factor confirmatory model(*)

Constructs		Attitude	Norms	PBC	Intention	Behavior
Attitude		**1**				
SN	Correlation	**0,338**	**1**			
	Chi-sq	12,2 (455,2)				
	RMSEA	0,029(0,39)				
PBC	Correlation	**0,574**	**0,249**	**1**		
	Chi-sq	21,7 (162,0)	8,7 (210,9)			
	RMSEA	0,057 (0,226)	0,021 (0,329)			
Intention	Correlation	**0,574**	**0,493**	**0,405**	**1**	
	Chi-sq	27,4 (222,4)	15,7(233,4)	23,7 (194,3)		
	RMSEA	0,073(0,226)	0.068(0,347)	=,097(0,315)		
Behavior (**)	Correlation	**0,734**	**0,533**	**0,656**	**0,667**	**1**

* *The numbers in parenthesis is one-factor model index; ** variance set to 1.0; all correlation are significant at 0.001.*

The table 4.40 shows two-factor models are better in Goodness of Fit than those of one-factor model respective to any index. Discriminant validity of the model involving 4 internal components is confirmed.

4.4.2. Structural model of TPB

The basic model is firstly estimated as proposed by TPB, in which behavior is predicted by intention and PBC, and intention in turn is determined by attitude and norm. The structural model appeared Goodness-Fit with present data, chi-square for the model is 139.2 with 62 degree of freedom ($p<0.0001$); RMSEA value is 0.078 within the recommended level, and CFI is 0.931 exceeding the recommended level of 0.9. We also examined residuals of observer variables. They are all significant at 1% and the variances

are all less than 2.0. The results of standardized regression coefficient from the estimation is presented in figure 4.1a, the t-values associated to the coefficient is in parenthesis.

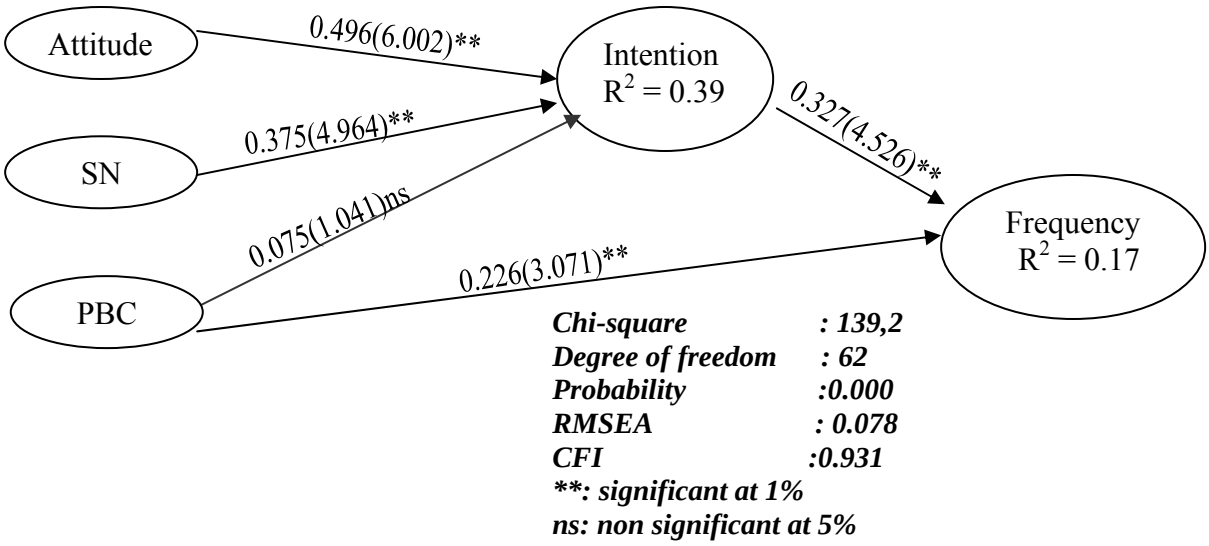

Figure 4.1a: Standardized regression coefficient of TPB model, t-value in the parentheses

Generally, the structural model confirmed main hypotheses proposed by TPB, except the relation between intention and personal control. Intention to eating fish is significant predicted by attitude and social norms, the coefficient paths are 0.496 and 0.375, respectively. The coefficients are significant at 1% level. Attitude and norms explain for 39% variance of intention.

Both intention and personal control are significant determinants of fish consumption frequency. The coefficient path between frequency and intention is 0.327 and significant at 1% level, and between frequency and PBC is 0.226 and significant at 1% level. At significant 5% level, it wasn't found a significant influence of PBC on intention. The model estimated shows that 17% variance of consumption frequency is explained by intention and PBC.

A modified model was estimated by considering direct influence of attitude and norm on behavior frequency, indicated by dotted lines in figure 4.1b. The Goodness of fit of modified model is as good as presented in figure 4.1b. The modified model fit better the data than initial model by all indexes, chi-square (126.4; df=59; p=0.000), RMSEA

(0.074), and CFI (0.094). The standardized coefficients and corresponding t-value of the relationships are presented in figure 4.1b.

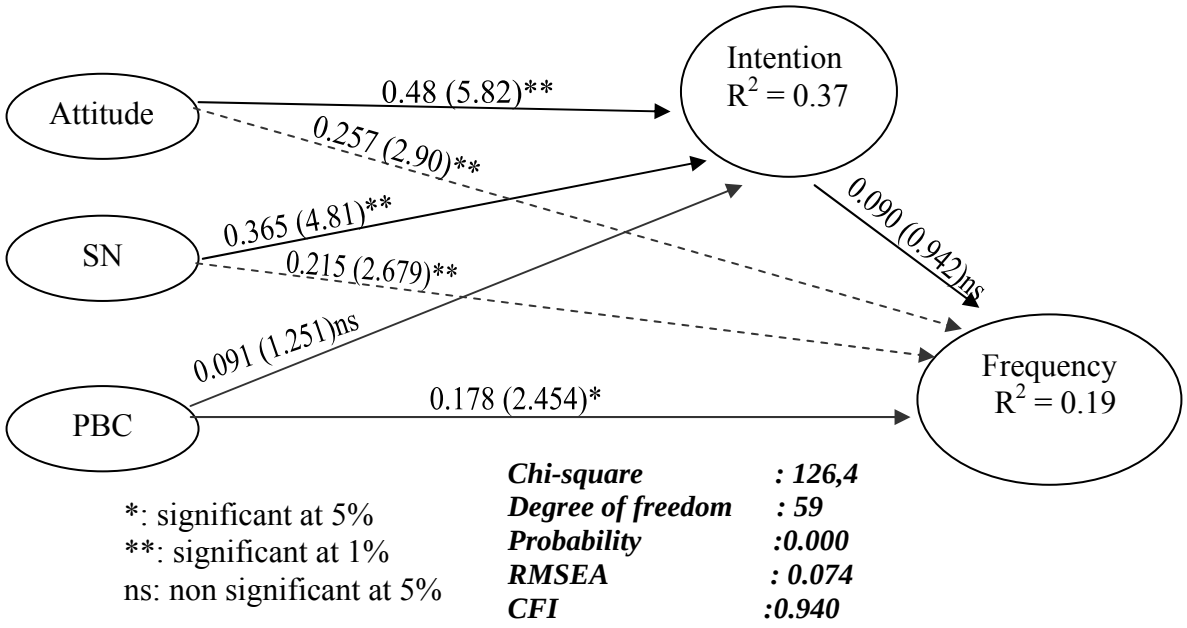

Figure 4.1b: Standardized regression coefficient of modified model, t-value in the parentheses

The modified model explored that the role of intention as a mediator for the relationship between attitude and norms with behavior is insignificant. Although the explained variance of intention by attitude and norm are almost remained (R^2=0.37), and the coefficients of the relations between the constructs are significantly high, the frequency is insignificantly predicted by intention (p-value=0.346).

The coefficients of direct effects of attitude and norms on behavior are significant at 1% level. The regression coefficient of attitude and frequency is 0.257 (t-value=2.90), and norms and frequency is 0.215 (t-value = 2.679). The impacts of attitude and norms on behavior are almost remained compared to the initial model.

The modified model improves the explanation of the behavior variance slightly from 17% to 19%. The influence of PBC on intention is still insignificant, and on behavior is reduced to 0.178 and significant at 5% level.

4.4.3. Confirmatory factor analysis of attribute's beliefs model

At the beginning this study assumes that the attitude toward fish consumption is determined by 6 latent factors (quality, negative effect, healthiness, value, convenience, and availability), and personal control is determined by 3 of them (value, convenience and availability). However, factor analysis and descriptive analysis explored that indicators of convenience involve two latent factors that are time consumed to cook and prepare, and suitable to dishes. The study failed to measure the healthy attributes by two items of "unhealthy/healthy" and "not nutritious/nutritious". The results show that two items are not suitable to describe the same constructs, and they have no-normal distributions. For these reasons, we decided to remove the healthy construct out of causal model. In a similar way, it is found that the items of "not appealing/appealing to children" and "unsuitable/suitable to elderly" are not high reliable in describing one factors, and they are also not considered in testing for causal relationships.

Finally, the attribute beliefs model involves 6 predictors of attitude and personal control. They are quality, negative effects, suitable (to dishes), value, time, and availability. Initial model of attribute beliefs includes 25 items provided a significant result in term of Goodness of Fit (RMSEA=0.061). However, structural model consisted of the 25 items had a poor empirical result (RMSEA=0.083). We decided to remove some items that have large residuals. The process resulted in two items of attitude "dull/exciting", one items of value "good value for money", and two items of suitability "difficult/easy to store" and "suitable/unsuitable to prepare for many dishes".

The final confirmatory model consisted of 21 indicators for 8 constructs resulted a good fit for present data (χ^2=208.3, df=161, p=0.007; RMSEA=0.038; CFI=0.979). Table 4.41 presents standardized factor loadings of items with associated t-values, composite reliability and variance-extracted scores of the constructs.

Table 4.41: Standardized CFA coefficient and reliability of belief constructs

		Standardized Factor Loadings	t-value	Composite Reliability	Variance extracted
Attitude				0,94	0,80
	Bad-good	0,85	[a].000		
	Unsatisfied - satisfied	0,91	17,86		
	Negative-positive	0,88	16,56		
	Unpleasant-pleasant	0,95	19,41		
PBC				0,82	0,60
	If I wanted	0,79	[a].000		
	For me to eat fish	0,79	10,90		
	Personal control	0,73	9,88		
Quality				0,75	0,51
	Appearance	0,68	[a].000		
	Taste	0,80	8,65		
	Texture	0,64	8,01		
Value				0,70	0,55
	Suit my budget	0,90	[a].000		
	Not expensive	0,54	4,00		
Suitability				0,77	0,63
	Prepare many dishes	0,71	[a].000		
	For delicious dishes	0,88	8,15		
Consuming time				0,86	0,75
	Cooking time	0,84	[a].000		
	Preparing time	0,89	9,44		
Availability				0,75	0,61
	Easy buy	0,88	[a].000		
	Available	0,67	5,52		
Negative affect				0,85	0,80
	Difficult to move bones	0,88	[a].000		
	Unpleasant bones	0,91	12,75		
	Unpleasant Smell	0,61	9,20		

χ^2=208.3, df=161, p=0.007; RMSEA=0.038; CFI=0.979.

[a] *The value is not calculated because the parameter is fixed to 1.0*

The results in table 4.41 show a convergent validity of the constructs. Factor loadings of items are all high and significant. With except for the item of "not expensive" (0.54), the other items have factor loadings above 0.6. T-value associated with item loadings range from 4.0 to 19.4, are all significant ($p<0.001$). Composite reliabilities are all above 0.7, exceeding far recommended level of 0.6 (Hair *et al*, 1995). The variance-extracted scores are above suggested value of 0.5 (Hair *et al*, 1995).

The inter-correlations among constructs used are listed in table 4.42. The correlation coefficients are all significant ($p<0.001$). The highest correlation coefficient found is between "attitude" and "quality" (0.754).

Table 4.42: Means, standard deviation, and inter-correlation of belief constructs(*)

	Means	Standard Deviation	1	2	3	4	5	6	7	8
Attitude	5,7	1,37	1.0	,575	,754	,240	,419	,234	,150	-,076
Control	4,7	1,25		1.0	,471	,376	,638	,427	,366	-,109
Quality	5,4	0,38			1.0	,401	,507	,410	,357	,112
Value	5,0	3,84				1.0	,413	,397	,334	,076
Suitable	5,3	1,31					1.0	,521	,333	,009
Time	4,6	1,25						1.0	,387	-,015
Availability	5,7	0,99							1.0	,155
Negative	4,8	4,66								1.0

* *all significant at 1% level.*

A further discriminant analysis was performed by applying the approach recommended by Fornell and Larcker (1981), which examined the average variance extracted scores from two constructs and the square of the correlation between associated constructs. The process result that average variance extracted for pairs of constructs are all greater than square of the correlation between them. For example, average variance extracted for attitude and quality is 0.66 (calculated by (0.80+0.51)/2), which is greater than the square of their correlation of 0.57 ($=0.754^2$). In sum, the discriminant validity of the constructs used in the model is confirmed.

4.4.4. Structural model of attribute beliefs

Once the convergent and discriminant validity of constructs within the proposed model were confirmed, we estimated structural model for six underlying predictors and two latent dependent variables. The structural model of attribute beliefs involving 21 indicators resulted in figure 4.2. The Goodness of Fit of the structural model is moderately significant. Apart from Chi-square (χ^2 =413.4, df=197, p=0.000), RMSEA is just at minimum acceptable level of 0.08, CIF (0.895) is slightly below the acceptable level of 0.90. The moderate Goodness of Fit is probably from the small size of sample. The ratio of observers and variables (e.g. exogenous and endogenous) in the model is only 4/1 that is slightly below of suggested ratio of 5/1 (Hair *et al*, 1995). The model fit probably is improved if the sample size is increased.

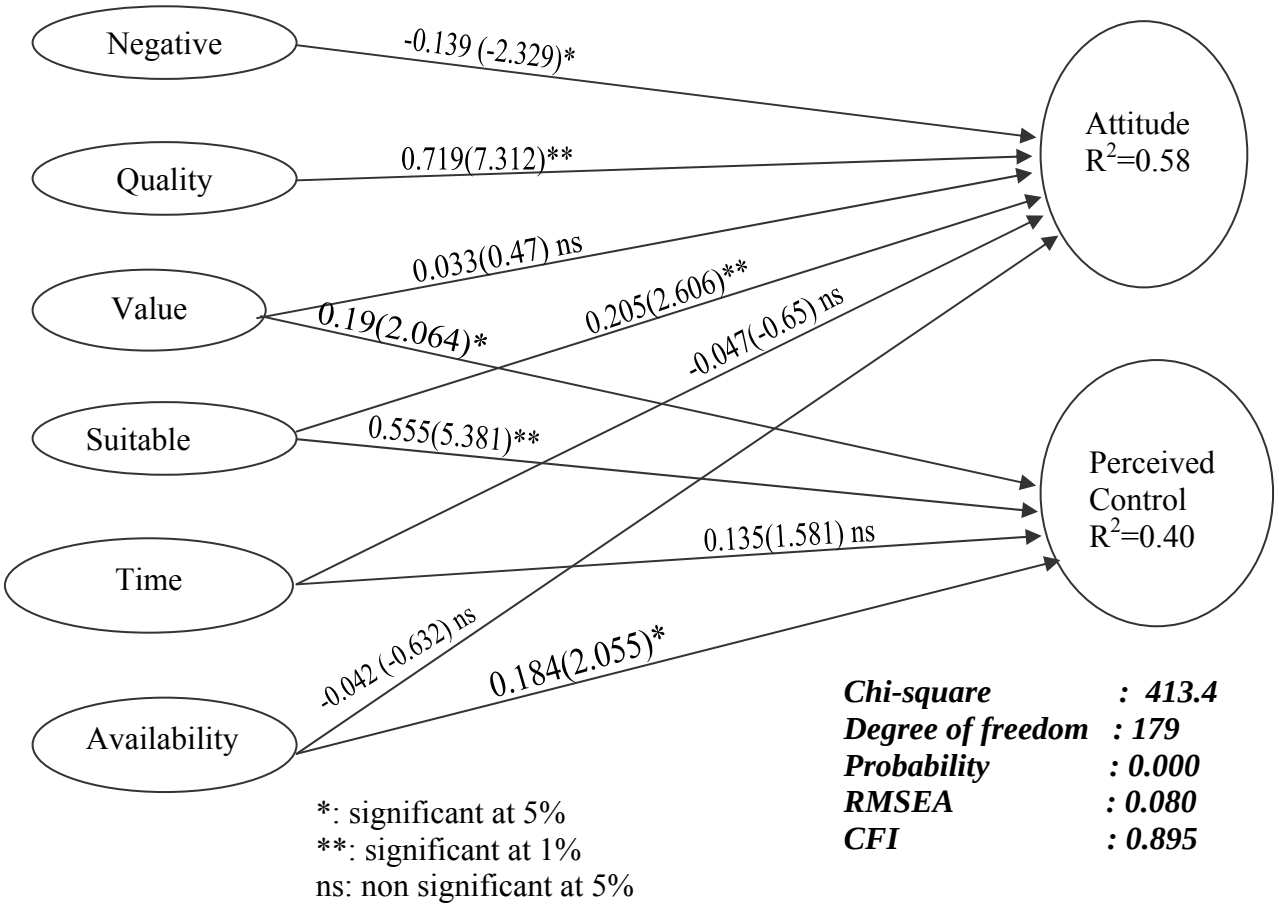

Figure 4.2: Standardized regression coefficient of beliefs model, t-value in parentheses

The results in figure 4.2 show that the attributes such as negative effect, quality, and suitable to dishes have significant influences attitude toward eating fish in the area. Unpleasant bones and smell impact negatively on the attitude, regression coefficient of the relation is –0.139, t-value associated is –2.329 ($p<0.05$). Perceived quality has strongest and positive impact on the attitude, coefficient of 0.719 is significant at 0.001 (t-value=7.312). Suitable to dishes is unique factor that has significant influence both attitude and personal control. The regression coefficient of suitable to dishes with attitude is 0.205 (t-value=2.606), with personal controls is 0.555 (t-value=5.381). The regression coefficients of suitability with attitude as well as personal control are all significant at 0.01.

Apart from construct of suitability, the model explored only perceived value and availability have moderate influence personal control, all significant at 5%. Regression coefficient of control with value and availability are similarly high of 0.19 (t-value=2.064), and 0.184 (t-value=2.055), respectively.

Attribute of time consumed to cook and prepare fish as meal was not found to significantly influence attitude as well as personal control. The model explains for 58% variance of attitude toward eating fish, and 40% variance of personal control over fish consumption of consumers in the area.

In conclusion, the results from casual models confirm that TPB are suitable to explain the fish consumption behavior in the Vietnamese context. Eating fish behavior is significantly determined by intention, attitude, norm and personal control. The fish attributes of quality, negative effects, and suitability are important factors determining the attitude toward seafood consumption; perceived value, suitability, and availability are significant indicators of the perceived control over fish consumption. The attribute beliefs model explains a high variance of attitude as well as control, whereas global model of TPB explained for a moderate variance of fish consumption frequency.

5. Discussion and Conclusion

This study is one of the first attempts to investigate attitudes, motivation, and consumption of seafood among a group of Vietnamese consumers. It includes a further assessment to understand how the main product attributes influence attitude and barriers toward the consumption. The study applies TPB (Ajzen, 1991) as a conceptual framework with some extensions. The items designed to measure the constructs within TPB were adopted from previous researches in Western countries. In academic aspects, the study purposes to test the appropriateness of TRA and TPB and its measures for an application in Vietnam context. A convenience sample was collected through direct interviews of households in Bacninh, an inland province in Vietnam. The analysis methods employed were primary factor analysis, descriptive analysis, and SEM.

The overall results confirm that TPB and its measures are suitable for applying in the Vietnam context. The results of this thesis are useful for managerial and theoretical purposes. The following sections discuss further the findings regarding the research issue and questions. Conclusion and some suggestions for future researches will end the thesis.

5.1. Behavior and intention toward eating fish

Vietnam has large potential in both marine and freshwater fisheries resources. However, seafood consumption of inhabitants is very infrequent. The respondents in Bacninh reported that they eat fish at home only once a week and just 2 or 3 times a year away from home. This self-report is consistent with the statistic data, which shows that seafood consumption per capita of Vietnamese people is only 23kg/year (FAO, 2005). Bacninh is an inland province; the inhabitants mostly consume freshwater species that are locally supplied by mainly small-scale aquaculture and sometimes from river or rice paddy fishing activities. The consumption per capita in the area is only 9kg/capita/year or 170g/week/capita (FAO, 2005), which is significantly lower than the overall average for Vietnam. The seafood consumption of Vietnamese people, particularly in inland regions, is considerably lower than other countries such as Japan, Korea, China, or Western countries.

The study found no significant difference among demographic and among economic groups of consumers in eating fish at home. It is indicated that fish as a meal in

the area is a common food that is eaten broadly, without any differences between young and elderly people, males and females, single and married people, families with or without children, ect. The consistencies among demographic and economic groups in fish eating frequency also confirmed that data collected from different groups was appropriate for testing the causal models. The findings of consistency between demographic groups in fish consumptions were also reported by studies in US and Norway (Fagerli & Wandel, 1999; Myrland, 1998; Nayga & Capps, 1995)

The frequency of eating fish away from home was found to be relatively low. However, this reflects the traditions that Vietnamese people prefer to eat at home with family members. The difference of eating fish away from home between single and married people, males and females, and between low- and high-income groups may be explained by these groups having different opportunities to eat out, rather than reflecting the habits or preferences for eating fish away from home. For example, single men and people with high incomes are observed as more frequently eating out than those of females, married persons, and low-income classes. The higher frequency of eating fish away from home is expected when income per capita and life standard is improved.

Intention within TPB is defined as motivation toward the behavior (e.g. fish consumption). The three items used to measure the construct of intention appeared as a good internal convergence. The Cronbach's alpha of above average value (0.81) of previous social studies (Peterson, 1994) and high factor loadings show that the items are suitable to describe the constructs. This study confirmed that intention is a significant predictor of behavior as proposed by TPB, and correlation between intention and behavior is significant high (0.67) as reported in social as well as seafood studies (Ajzen & Fishbein, 2005; Olsen, 2001; Verbeke & Vackier, 2005).

However, this study also found abnormal high correlations between behavior with and other constructs within TPB, especially with attitudes. The lower correlations between attitude, norms, and control with intention than the correlations between these components with behavior are not found in previous studies. In addition, the mediator's role of intention becomes insignificant when attitude and norms were considered as direct determinants of the behavior. These results are probably explained by two reasons. The first reason may come from the measurement of intention. The frequency of fish

consumption in the area is reported at once a week, however, the items designed to measure intention have time intervals of next three days. This seems to be too short a time interval and not compatible with the behavior frequency. As a result, respondents reported that their intention in eating fish in three days were moderately likely, and much lower than their attitude and norm scores. Since this is the first attempt, we didn't know in advance the consumption frequency and an adequate time interval related to intention. This limitation suggests that future researches should measure intention by a time interval of one or two weeks.

The second reason for low intention's scores and direct effects of attitude and norm on behavior may be explained by habitual factors. According to Berg *et al* (1999), the significant direct effects of attitude and norms on behavior are probably because the selection of food is under the control of habitual rather than rational factors. In addition, the moderate effect of intention on behavior in original model of TPB (β=0.327) also implies that the behavior is under low volitional control (Fishbein & Ajzen, 2005). The findings reveal that another construct may be more appropriate to mediate the attitude-behavior relation, and the habitual factor should be considered in future researches.

5.2. The role of attitudes toward seafood consumption

Five integrated items designed to assess global attitude toward fish consumption appeared to be reliable to represent the construct (Cronbach's alpha = 0.95). In general, fish as a meal was evaluated as good or extremely good, and consistent among groups of consumers in the area. The study confirmed that attitude was the strongest predictor of intention in the social as well as the food context (Ajzen, 1991; Conner & Armitage, 1998; Fishbein & Ajzen, 2005; Olsen, 2001, 2004; Shepherd & Raats, 1996; Saba & Vassallo, 2002; Verbeke & Vackier, 2005). The correlation of attitude with intention (α=0.57; $p<0.001$) and with behavior (α=0.74, $p<0.001$) was significant high. The impact of attitude on behavior was very significant both directly and indirectly.

These direct and indirect impacts of attitude on behavior may be explained by the MODE (Motivation and Opportunity as Determinants) model (Fazio, 1990). According to MODE model, attitudes guide behavior through two ways: either a deliberative (e.g.

controlled) or a spontaneous (e.g. automatic) fashion. Where the individual is highly motivated and capable of thinking in a controlled fashion, behavior is held to be thoughtfully planned, based on one's attitude toward the behavior (deliberative process). In this mechanism, the influence of attitude on behavior is mediated by the plan (intention) as described by TPB. However, where motivation or opportunity for controlled process is absent, attitudes are held to impact on the behavior in an automatic way (spontaneous process). In the spontaneous process, attitudes toward an object/target are assumed to be strong (highly accessible), and may automatically be activated from the memory to guide the behavior directly (Ajzen & Fishbein, 2005; Conner & Armitage, 1998). The customers' behavior of eating fish may correspond with their prior intention or they may have not prior intention. For both cases, the global evaluation of fish as meal plays a significant role in determining the behavior.

5.3. Which attributes are important in forming global attitude?

Fishbein and Ajzen (1975; 1991) proposed that behavioral beliefs are the main determinants of attitude, and then attitude can be assessed by number of salient beliefs related to the behavior in question. In a marketing perspective, the salient beliefs are defined and assessed by quality attributes and quality cues (Peter & Hans, 1995). The study confirmed that perceived quality, which was assessed by taste, appearance, and texture, is the most important attribute determining satisfaction and evaluation (β=0.72; $p<0.0001$) in seafood context (Olsen, 2004), whereas bones and smell are unique attributes having negative effect on the attitudes (β=-0.14; $p<0.01$) (Olsen 2001; 2004; 2003; Verbeke & Vackier, 2005).

The studies in developed countries reported that convenience is a very important attribute of food/seafood choice (Olsen *et al*, 2006; Steptoe *et al*, 1995), and convenience involves a complex aspects regarded to various stages and types of cooking and preparing process (Gofton, 1995). In the present study, two sub-components were extracted from the items designed to assess convenience, which are suitability of fish for a variety of meals and situations, and perceived time used to cook and prepare fish as meal. These sub-components have different impact on attitude and perceived control.

The customers in the area evaluated significantly that fish is suitable for cooking and preparing many dishes in various situation. The respondents rated suitability attribute as just behind perceived quality, and the second most important predictor of both attitude and personal control. The finding is consistent with the discussion of Leek *et al* (2000) about the suitability of fish for a variety of meal situations and its physical properties. The result also reflects the truly traditional cuisines and customs of Vietnamese that fish can be cooked in many ways such as brine, fried, grilled, mixed vegetable-fish soup, hot pot, boiled, grilled chopped fish, ect. Fish is often prepared and cooked on special occasions, such as vacations, guests visiting and other social events including friends or family.

The time used to cook and prepare a meal is suggested as one of the important barriers influencing food choices (Gofton, 1995), and has negative effect on attitude toward fish consumption in European countries (Olsen *et al*, 2006). However, this study found that the amount of time used to cook and prepare meals with fish was not a significant determinant of attitude as well as personal control. More than 60% respondents scored that cooking and preparing fish is not very time consuming, and 20% of respondents were ambivalent in evaluating the attribute. These results reflect the fact that, in developing countries such as Vietnam, when the time budget of individuals are available, the cooking time is not considered as main criteria/barriers for choosing ingredients for meals.

5.4. How norms influence intention and consumption?

Within TPB, social norms are often the weakest indicators toward intention (Ajzen, 1991; Fishbein & Ajzen, 2005). However, this study confirmed that social pressure is a significant and strong indicator of intention to consume fish (Berg *et al*, 1999; Olsen, 2001; Shepherd, 1989). The three items used to measure social norms and family expectation on eating fish had very high factor loadings and appeared to be highly internally consistent (Cronbach's alpha = 0.92). The norms correlated significant with intention (α=0.49, $p<0.01$), and with behavior (α=0.53, $p<0.01$). The significant impact of norms on both intention and behavior may be understood by MODE model discussed above, which the norms influence behavior through controlled as well as automatic fashions (Fazio, 1990).

The significant impacts of social norm and family expectation on intention and behavior of eating fish are understandable in Vietnam situation. Vietnamese family is often large in size, which has more than 2 people (see table 3.1.). The family members often share two or three meals a day at home. Due to eating together, the family members are more or less "forced" to eat what are cooked by another members (Olsen, 2001). This is required that individuals, particular who are main cook, must learn about one another's tastes, likes, dislikes and preferences, negotiate and compromise in order to arrive at meal which every one could enjoy (Kemmer *et al*, 1998).

According to Vietnamese tradition, women are usually responsible in shopping and cooking. However, man and women have balance of power in expenditure and food choice. In addition, Vietnamese women are known as tolerable people, this means that they are very concerned the health and preference of family members. As a main cook, housewife should make more effort in preparations of "proper meal", for example of more items went onto the plate, for her husband and children (Kemmer *et al*, 1998). In addition, Vietnamese family usually involves grandparents, parents, and children. In the great family, elderly people have strongest "power" in deciding food purchase and preparation. Usually, children and elderly people are mostly referenced for deciding what are chosen for meals. Housewife so must listen to her family, especially the grandfathers and children, and take them seriously and incorporate their attitude into their motivational aspects (Olsen, 2001).

5.5. Perceived control and barriers toward seafood consumption

Global perceived control was assessed in this study by asking the respondents to rate their-self perception of eases/difficulties in executing fish consumption. The perceived behavioral control has been criticized as overly simplistic (Terry, 1993) and several studies have found week internal reliability of items designed to measure the construct (Beale & Manstead, 1991). However, the three items in this study had high factor loadings and appeared highly internal reliability (Cronbach's alpha = 0.823). In general, respondents reported that they face moderate difficulties in control of the barriers against consuming fish as meal. Perceived control was found to be highly correlated with both intention (α=0.405, $p<0.001$), and behavior (α=0.67, $p<0.001$). In the causal models, the control

was found only as a significant predictor of the behavior, but insignificant impact on intention. The relative little contribution of perceived control in explaining variance of intention was also found in the studies of common food consumption behavior (Sparks, Heddeerly & Shepherd, 1992).

The insignificant effect of perceived control on intention, but significant effect on behavior may be explained by the differences between perceived control and actual control (Fishbein & Ajzen, 2005). The consumers in the area perceive that fresh fish is very available and reasonable price so that the process of forming intention to consume fish is mainly based on their evaluation and family expectation, rather than on perception of ease or difficulties to purchase and engage in consuming the food. The difficulties and barrier actually occur only during performing the intention. The seasonal effects and fluctuated price of fish supply may be the reasons that create the differences between perceived and actual control over fish consumption.

According to TPB, the perceived control is determined by control beliefs. The study found that attributes such as perceived value, suitability, and availability were the significant indicators of perceived control. Perceived value was found as having significantly positive and moderate impact on personal control ($\beta=0.19$; $p<0.05$). The respondents in the area rated eating fish as not expensive and good value for money. This result is possible to be understood and explained in the context of Vietnam where fish is observed as being cheaper and easier to assess (reasonable price) than other foods such as pork, chicken, or beefs. Fish as meal is highly accessible and the families can afford to consume fish every day. In addition, fish is also perceived as available in the areas. More than 60% of respondents stated that fish is available and easy to buy, while 20% respondents were neutral in score. Availability impacted on personal control positively at a moderate amount ($\beta=0.184$, $p<0.05$). Fresh fish in the area are supplied mainly by small-scale aquaculture and the source appears to be available but seasonal. In the area, the fresh fish is observed as most available in the end of year, from October to December, when farmers exploit famed fish from the small-scale ponds. Highly available but seasonal supply may explain for the insignificant impact of availability on general attitude, but significant effect on actual control over the consumption

Only suitability as a sub-component of convenience determined significantly perceived control. The time invested on cooking and preparing fish that is suggested as external factors inhibiting the fish consumption (Gofton, 1995; Olsen, 2006) was not found significant effect on perceived behavior control.

5.6. Other important factors

Habit, involvement, health consciousness, and knowledges are suggested as very important factors in food choice. This study assesses the factors in form of descriptive analysis, tests of reliability, and mean difference. Generally, the items designed to assess these constructs appear highly convergent, except the items of habit.

The study found that there was a difference in scores of items designed to measure individual's habit and item of family's habit. Two items designed to measure the individual habit appeared not highly inter-correlated and convergent with one item referring to family habit. The conflict and ambivalence of like and dislike seafood in many families were found (Olsen, 2004). In the case of large family size, the family habit may not reflect the individual's habit. However, the score distribution showed that major respondents reported that they were very familiar with eating fish across all three items. The results suggest that habit may be important determinant of eating fish behavior, and the construct should be suggested as an important component for TPB extension in food context (Sheppherd, 1989).

The involvement was defined and measured as enduring product importance in Olsen (2001) study appeared at low internal convergence. Three items designed to measure involvement in this study resulted a highly internal reliability (Cronbach's alpha = 0.853). Traditionally, seafood is considered as important source to diversify daily meal' ingredient and be suitable to many situations. This suggestion was confirmed by the high scores across items. More than 80% respondents rated that fish is important, meaningful, and they care a lot. Compared to the items expressing intention of eating fish, items of involvement appeared higher internal reliability and higher in scores. These results suggest that involvement may play as a mediator for attitude-behavior relation (Olsen, 2001).

The items designed to measure the health consciousness are scored as very highly positive and reliable to represent the construct (Cronbach's alpha = 0.719). However, the distribution of score is not a normal path so that it is not appropriate for multivariate analysis (Hair *et al*, 1995). More than a half of respondents rated items of "I am a health-conscious person" and "varying dishes of meal is important" at point of 7. Majority of respondents rated at 6 or 7 categories across four items. The problems may come from the expressing items that are too overall in meaning.

The effect of knowledges on behavior has not fully investigated in seafood context (Olsen, 2004). This survey found that inhabitants in the area are highly knowledgeable about fish cuisine. More than 60% respondents responded that they have knowledge or experience related to fish. The two items expressing knowledges related to fish quality evaluation and general experience of the culinary aspects of fish appeared reliable in describing the constructs (Cronbach's alpha = 0.850). A further assessment of knowledge in future studies is necessary for such the place as Bacninh, where the inhabitants are very skillful in cuisine as well as other home works.

5.7. Managerial and theoretical implications

The study found that the consumers in the area consume fish at a very low frequency. However, their general attitude towards fish consumption and the motivation to eat fish are significantly positive. Fish as meal is a common and broadly consumed food in the area. It was not found any difference in the consumption frequency as well as evaluation of fish as meal among demographic and economic groups. These results confirm that the seafood industry has a high potential for expanding its domestic market into the inland areas. The potentials are also increased when income and living conditions are improved, and followings are demand for healthy eating.

In addition, the economic development of the country in recent decades has created the significant demand for tourism and leisure activities. The demand for eating at restaurants increased dramatically, especially the young and urban people. However, this study shown that the frequency of eating fish away from home is very low. It suggests that advertising and product promotions are required in order to increase the product demand.

The results shown that the including fish in cuisine were perceived as high quality and suitability to variety of dishes. The seafood industry and companies can take these advantages to promote their product demand. However, in recent years, food safety has been an issue regarding fish products because aquaculture farms, using small and saturated-currency ponds and artisanal fishmeal, are the main supplies of fish. Fish is scored as highly suitable for dishes in different situations, but the materials used must be fresh fish. Fresh fish is required much more time invested in the cooking and preparing processes compared to other materials like pork or beefs. Time used to cook and prepare was not found as having significant effect on attitude as well as perceived control. However, when lifestyles and incomes improve, fresh fish may become redundant materials and not preferred for choice.

Consistent with prior studies, unpleasant smell and bones are found as main barriers toward fish eating. The effects of unpleasant bones are very negative. This is particularly relevant for the species called Rohu (scientific name of *Labeo rohita*), which is commonly farmed and consumed in inland area of Northern Vietnam. In this context, suitable species for aquaculture needs an investigation.

In academic aspects, the present study shown that TPB are suitable to predict and explain seafood consumption behaviors in the Vietnam context. Seafood consumption behavior is possibly explained and predicted by intention and personal control. However, the two constructs explained the variance of the behavior at a moderate amount, only 17%. Moreover, the significant and direct effects of attitude and norms on behavior reveal that behavior in this context is not completely under volitional control. It is required an extension of the model in future researches by considering additional constructs (Ajzen, 1991).

The intention of fish consumption can be explained and predicted by attitudes and intention, but not by personal control. In other word, the TRA is more appropriate in explaining intention than those of the TPB. Global attitudes and personal control in turn are sufficiently predicted and explained by their salient beliefs. The significant correlations between direct and indirect measures of the TPB components suggest for establishing a full model that is possible for future studies.

Fish as meal is a common food and consumed broadly in the area. The study did not found a significant difference among demographic and economic groups in ranking items of consumption frequency as well as almost of all items designed to measure the constructs within TPB. This ensures that the data, which combing different groups, is appropriate for causal model test. However, external variables such as age, sex, income, ect. may influence indirectly the consumption and its predictors (Fishbein & Ajzen, 1975; 2005). Therefore, these demographic and economic factors should be investigated further in future studies.

The studies adopted almost of all items that are successful used in Western culture. In general, these items are reliable to represent the constructs and applicable for Vietnam context. The items designed to measure healthy and appealing constructs appeared not reliable. This requires other explanations of these items or even other items should be found to assess these healthy and appealing attributes. In the case of large family size, items designed to measure individual's habit is not convergent with items of family habits. The future studies should split the construct of habit into two sub-components.

5.8. Limitation and suggestion for future researches

Although attitude and motivation toward eating fish are positive and highly significant, the consumers in the Bacninh province consume fish at a low frequency. The study found that only bones and smell are barriers for the consumption. A qualitative research by in-depth interviews to explore other "local" factors may be necessary for future researches. In addition, a moderate explanation of variance of estimated models suggests that additional constructs are possible to be added into the causal models (Ajzen, 1991). TRA and TPB are often extended by considering several constructs such as habit (Shepherd, 1989; Verbeke & Vackier, 2005), eating fish involvement (Olsen, 2001; 2007), self-identify (Armitage & Conner, 1999; Spark & Shepherd, 1992), moral obligation (Olsen, 2001; Raats *et al*, 1995), and healthy consciousness (Gempesaw *et al*, 1995; Olsen, 2001; 2003).

When the behavior is repeated and becomes more habitual, the performance of the behavior is more likely to depend on habit rather than a rational statement of intentions (Triandis, 1977). The habit concept has been suggested and proved as a significant role in

explaining the behavior in theoretical perspective (Triadis, 1980) as well as empirical researches (Shepherd, 1989; Verbeke & Vackier, 2005). The results in this study suggest that habitual factor may be important and independent predictor of fish consumption, and it may improve the explained capacity of the models. However, investigators need to find out more appropriate items designed to measure the constructs.

The intention was measured by the items within time interval of next three days had a moderate score and appeared not consistent with the consumption behavior. This limitation suggests that the future studies should measure the intention within a longer time interval, for example in one or two weeks. In addition, intention explained a low variance of the behavior in initial model and a non-significant predictor when attitude and norms influence directly the behavior. This raised the questions of appropriateness of intention in explaining for a habitual behavior (Triandis, 1980). As long with the importance and interest in, involvement is argued to capture motivational aspects of behavior (Boninger *et al*, 1995). Involvement was found as a significant mediator of relationship between attitude and behavior in seafood studies (Olsen, 2001, 2003). The items designed to assess involvement construct in the study appeared highly internal consistent and scored very positively. Future studies can apply these items to measure involvement and the construct may be appropriate to substitute for intention.

According to Fishbein and Ajzen (1975), subjective norms are formed by normative beliefs. However, this study assessed subjective norms only in a global level. Self-identity, moral obligation, health involvement that all reflect the social pressure on the behavior should be considered in future. Self-identity is held to represent the extent to which individuals perceive themselves as fulfilling as a particular societal role (Stryker, 1968) and proved having effect over or above subjective norms when it was added in food study (Armitage & Conner, 1998; 1999; Spark & Shepherd, 1992). Moral obligation takes account of personal feelings of responsibility to perform or refuse to perform a certain behavior (Ajzen, 1991). Moral norm is proved significant influence motivation and behavior of food and seafood consumption (Olsen, 2001; Raats *et al*, 1995) and explained for increase of fish consumption associated with family size (Myrland *et al*, 2000). Seafood is often evaluated as healthy food and elderly people are more health conscious than younger people (Roininen *et al*, 1999; Olsen, 2003). Some studies indicate that health involvement or the importance of healthy eating are more appropriate factor in explaining

fish consumption than the belief that fish is healthy (Gempesaw *et al*, 1995; Olsen, 2001; 2003).

Concerning to the product attributes, healthy and risk beliefs may become important indicators of attitude and motivation toward the consumption when the income and life is improved. Although fish is broadly evaluated as healthy items, it is observed that the consumers often claim for poisonous and unsafe issues related to general food as well eating fish, especially for fish and animals that are often farmed by households and fed with artisanal foods. The study failed to measure an internal consistent construct of health. The items expressing "unhealthy/healthy" and "innutritious/nutritious" seem to be too general in the Vietnamese language and respondents rated the items significantly high and the score distributions had non-normal paths. In addition, the two items were suggested as differences in meanings (Leek *et al,* 2000). The future researches should look for different ways in expressing the items or find more specific items to measure the health construct.

TRA and TPB imply a causal link between beliefs, attitude, intention, and behavior. It seems to be more appropriate if the components of TRA and TPB are measured by a prospective design, and in which behavior measure is contemporaneous with measures of intention (Armitage & Conner, 1999). However, under the assumption of stable determinants, this study employed cross-sectional design and the behavior was measured by past behavior. According to Budd (1987), cross-sectional designs render questionnaire more vulnerable to consistency biases, which may artificially inflate relationships between beliefs, attitudes, intention and behavior. In addition, several studies shown that past behavior could predict later behavior independently (see a review of Conner & Armitage, 1998; Sutton, 1994). Another limitation of the study related to cross-sectional design is that the examination of the psychometric properties of the constructs is restricted to assessment of internal reliability (Armitage & Conner, 1999).

This study used structured questionnaire to assess the components of TPB. Several problems related to questionnaire methodology may occur. Potter and Wetherell (1987) argue that it is unclear: " whether people filling in an attitude scale are performing a neutral act of describing or expressing an internal mental state or attitude, or whether they are engaged in producing a specific linguistic formulation tuned to the context at hand"

(p.45). Several studies show the differences in internal reliability, significance and strength of intercorelations as a function of questionnaire format, social desirability and issues salience (Budd, 1987; Sheeran & Ordell, 1996). More specifically, Budd (1987) found that structured TRA questionnaire, which the multiple-items measures were presented together, produced considerably stronger correlations between components than randomly constructed questionnaires. Consequently, the role of questionnaire format may threaten the reliability and validity of the TRA & TPB (Armitage & Conner, 1999).

About the Goodness of Fit of models estimated, the study had moderate results. This may be caused by small sample size. The small sample size was also the reason for not including other constructs such as habit, involvement, health consciousness or knowledge into the model of TPB. The future researches should concern the ratio between observers and estimated coefficients, which is suggested to be within 10/1 to 5/1 (Hair *at al*, 1995). A full causal model of TPB, which involves all salient beliefs of product attributes, and extension of TPB by adding other important constructs are suggested for future studies. However, this requires a costly investment in sampling works.

Although there are some limitations of the study, the findings and suggestions are significant to the seafood industry as well as academic literature. The results in this study are only significant in an inland region of Vietnam. The results should not be generalized for the whole countries or Eastern regions./.

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Appendix 1: Pearson Correlations between items designed to measure TPB constructs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Consumer frequency	1	,383**	,364**	,345**	,485**	,450**	,418**	,457**	,466**	,260**	,347**	,391**	,290**	,357**	,293**
Plan to eat fish	,383**	1	,709**	,666**	,455**	,388**	,355**	,319**	,388**	,153*	,183**	,333**	,370**	,395**	,281**
Expect to eat fish	,364**	,709**	1	,643**	,541**	,506**	,498**	,464**	,482**	,207**	,293**	,280**	,385**	,408**	,364**
Will eat fish	,345**	,666**	,643**	1	,414**	,377**	,382**	,352**	,395**	,268**	,275**	,357**	,375**	,392**	,313**
Bad/good	,485**	,455**	,541**	,414**	1	,771**	,807**	,770**	,719**	,349**	,412**	,425**	,222**	,317**	,312**
Unsatisfied/satisfied	,450**	,388**	,506**	,377**	,771**	1	,867**	,813**	,794**	,326**	,427**	,421**	,235**	,313**	,294**
Unpleasant/pleasant	,418**	,355**	,498**	,382**	,807**	,867**	1	,850**	,836**	,403**	,408**	,445**	,181**	,287**	,278**
Dull/exciting	,457**	,319**	,464**	,352**	,770**	,813**	,850**	1	,821**	,405**	,447**	,435**	,235**	,318**	,324**
Negative/possitive	,466**	,388**	,482**	,395**	,719**	,794**	,836**	,821**	1	,336**	,449**	,393**	,228**	,335**	,292**
Personal control	,260**	,153*	,207**	,268**	,349**	,326**	,403**	,405**	,336**	1	,605**	,548**	,153*	,190**	,160*
For me eating fish	,347**	,183**	,293**	,275**	,412**	,427**	,408**	,447**	,449**	,605**	1	,635**	,184**	,165*	,177*
If I wanted	,391**	,333**	,280**	,357**	,425**	,421**	,445**	,435**	,393**	,548**	,635**	1	,220**	,192**	,143*
Important want	,290**	,370**	,385**	,375**	,222**	,235**	,181**	,235**	,228**	,153*	,184**	,220**	1	,781**	,788**
Family want	,357**	,395**	,408**	,392**	,317**	,313**	,287**	,318**	,335**	,190**	,165*	,192**	,781**	1	,834**
Important expect	,293**	,281**	,364**	,313**	,312**	,294**	,278**	,324**	,292**	,160*	,177*	,143*	,788**	,834**	1

Appendix 2: Pearson Correlations between items designed to measure attribute beliefs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Taste	1	,515**	,524**	,329**	,273**	,240**	,201**	,142*	,217**	,287**	0,019	,156*	,354**	,224**	,318**	0,09	,397**	0,125	,254**	0,025	0,063	0,098
Texture	,515**	1	,480**	,311**	,241**	,325**	,295**	0,059	0,119	,254**	0,085	,215**	,225**	,278**	,271**	0,015	,202**	,158*	,248**	0,002	0,087	0,112
Appearance	,524**	,480**	1	,298**	,200**	,300**	,252**	,166*	,140*	,368**	0,08	0,096	,311**	,268**	,259**	,184**	,359**	,230**	,338**	-0,021	0,06	0,066
Healthy	,329**	,311**	,298**	1	,156*	0,085	0,083	,140*	,397**	,215**	,165*	0,062	,206**	,291**	,271**	0,074	,176*	0,08	0,086	-0,114	-0,014	0,003
Easy buy	,273**	,241**	,200**	,156*	1	,309**	,252**	,588**	,243**	,191**	0,067	0,118	,234**	,357**	,288**	,169*	,211**	0,121	,253**	0,003	-,149*	-,164*
Time 1	,240**	,325**	,300**	0,085	,309**	1	,746**	,282**	,184**	,284**	,235**	,206**	,399**	,297**	,332**	,165*	,139*	,152*	,303**	-0,063	-0,022	0,003
Time 2	,201**	,295**	,252**	0,083	,252**	,746**	1	,214**	,194**	,264**	,255**	,300**	,381**	,344**	,332**	0,131	0,114	,223**	,346**	-0,061	-0,011	0,018
Available	,142*	0,059	,166*	,140*	,588**	,282**	,214**	1	,328**	,165*	0,053	0	,163*	,216**	,150*	0,072	,151*	0,047	,253**	-0,061	-0,036	-0,016
Nutritious	,217**	0,119	,140*	,397**	,243**	,184**	,194**	,328**	1	,308**	,240**	0,099	,167*	,285**	,200**	0,071	,148*	0,018	,151*	-0,025	-0,011	-0,033
To children	,287**	,254**	,368**	,215**	,191**	,284**	,264**	,165*	,308**	1	,286**	,283**	,374**	,370**	,402**	0,119	,264**	,287**	,198**	0,017	0,001	0,061
To elderly	0,019	0,085	0,08	,165*	0,067	,235**	,255**	0,053	,240**	,286**	1	,166*	0,085	,183**	0,128	0	0,031	0,023	0,076	-0,046	-0,031	-0,06
To store	,156*	,215**	0,096	0,062	0,118	,206**	,300**	0	0,099	,283**	,166*	1	,311**	,426**	,315**	,200**	,281**	,164*	,188**	-0,025	-0,056	-0,108
Good meal	,354**	,225**	,311**	,206**	,234**	,399**	,381**	,163*	,167*	,374**	0,085	,311**	1	,322**	,619**	,309**	,360**	,333**	,338**	-0,058	-0,009	-0,012
Cook ways	,224**	,278**	,268**	,291**	,357**	,297**	,344**	,216**	,285**	,370**	,183**	,426**	,322**	1	,604**	0,037	,244**	0,134	,139*	0,063	0,047	0,048
Dishes	,318**	,271**	,259**	,271**	,288**	,332**	,332**	,150*	,200**	,402**	0,128	,315**	,619**	,604**	1	0,121	,304**	,234**	,206**	-0,038	-0,071	-0,062
Noexpensive	0,09	0,015	,184**	0,074	,169*	,165*	0,131	0,072	0,071	0,119	0	,200**	,309**	0,037	0,121	1	,506**	,326**	,487**	-0,042	-0,053	-0,039
Good value	,397**	,202**	,359**	,176*	,211**	,139*	0,114	,151*	,148*	,264**	0,031	,281**	,360**	,244**	,304**	,506**	1	,178*	,424**	-0,082	-0,092	-0,035
Economical	0,125	,158*	,230**	0,08	0,121	,152*	,223**	0,047	0,018	,287**	0,023	,164*	,333**	0,134	,234**	,326**	,178*	1	,484**	-0,057	-0,033	-0,003
Budgets	,254**	,248**	,338**	0,086	,253**	,303**	,346**	,253**	,151*	,198**	0,076	,188**	,338**	,139*	,206**	,487**	,424**	,484**	1	0,038	0,084	0,066
Smell	0,025	0,002	-0,021	-0,114	0,003	-0,063	-0,061	-0,061	-0,025	-0,017	0,046	-0,025	-0,058	0,063	0,038	-0,042	-0,082	-0,057	0,038	1	,559**	,525**
Bone 1	0,063	0,087	0,06	-0,014	,149*	-0,022	-0,011	-0,036	-0,011	-0,001	0,031	-0,056	-0,009	0,047	0,071	-0,053	-0,092	-0,033	-0,084	,559**	1	,799**
Bone 2	0,098	0,112	0,066	0,003	,164*	0,003	0,018	0,016	-,033	0,061	0,06	-0,108	-0,012	0,048	0,062	-0,039	0,035	-0,003	0,066	,525**	,799**	1

Appendix 3: Pearson Correlations between items designed to measure other constructs

	1	2	3	4	5	6	7	8	9	10	11	12
From my childhood	1	,440**	,296**	,234**	,325**	,264**	,159*	,285**	,334**	,299**	,209**	,207**
Concern long-term effect of food to health	,440**	1	,613**	,503**	,521**	,509**	,314**	,404**	,408**	,269**	,277**	,289**
Experience related fish	,296**	,613**	1	,489**	,396**	,470**	,290**	,368**	,258**	,292**	,288**	,273**
Health-conscious person	,234**	,503**	,489**	1	,630**	,669**	,377**	,356**	,387**	,332**	,257**	,387**
I care a lot	,325**	,521**	,396**	,630**	1	,689**	,286**	,362**	,412**	,406**	,327**	,240**
Important of my diet	,264**	,509**	,470**	,669**	,689**	1	,322**	,283**	,425**	,295**	,213**	,291**
Knowledge to evaluate fish	,159*	,314**	,290**	,377**	,286**	,322**	1	,739**	,311**	,257**	,271**	,149*
Mean a lot	,285**	,404**	,368**	,356**	,362**	,283**	,739**	1	,437**	,443**	,343**	,220**
My family habit	,334**	,408**	,258**	,387**	,412**	,425**	,311**	,437**	1	,643**	,349**	,394**
My weekly routine	,299**	,269**	,292**	,332**	,406**	,295**	,257**	,443**	,643**	1	,443**	,364**
The most health-conscious person	,209**	,277**	,288**	,257**	,327**	,213**	,271**	,343**	,349**	,443**	1	,274**
Varying dishes of meal is important	,207**	,289**	,273**	,387**	,240**	,291**	,149*	,220**	,394**	,364**	,274**	1

Appendix 4: Regression weight of initial basic model

			Estimate	Standardized Estimate	S.E.	C.R.	P
Attitude	<---	Intention	0,985	0,496	0,164	6,002	***
SN	<---	Intention	0,596	0,375	0,12	4,964	***
PBC	<---	Intention	0,143	0,075	0,137	1,041	0,298
PBC	<---	Behavior	0,375	0,226	0,122	3,071	0,002
Intention	<---	Behavior	0,285	0,327	0,063	4,526	***
SN	<---	Important want	1,104	0,813	0,098	11,287	***
SN	<---	Family want	1,126	0,818	0,099	11,332	***
SN	<---	Important expect	1	0,791			
PBC	<---	Personal control	1,098	0,73	0,123	8,944	***
PBC	<---	For me eating fish	1,109	0,816	0,122	9,115	***
PBC	<---	If I wanted	1	0,733			
Attitude	<---	Negative-positive	1,442	0,848	0,142	10,135	***
Attitude	<---	Bad-good	1	0,721			
Attitude	<---	Unsatisfied-satisfied	1,28	0,777	0,13	9,851	***
Intention	<---	Plan	1	0,806			
Intention	<---	Expect	0,916	0,824	0,08	11,51	***
Intention	<---	Will	0,972	0,743	0,092	10,581	***

Appendix 5: Regression weight of modified basic model

			Estimate	Standardized Estimate	S.E.	C.R.	P
Attitude	<---	Intention	0,958	0,48	0,164	5,825	***
SN	<---	Intention	0,581	0,365	0,121	4,809	***
PBC	<---	Intention	0,174	0,091	0,139	1,251	0,211
PBC	<---	Behavior	0,289	0,178	0,118	2,454	0,014
Intention	<---	Behavior	0,077	0,09	0,082	0,942	0,346
Attitude	<---	Behavior	0,436	0,257	0,15	2,9	0,004
SN	<---	Behavior	0,291	0,215	0,109	2,679	0,007
SN	<---	Important want	1,103	0,812	0,098	11,313	***
SN	<---	Family want	1,128	0,819	0,099	11,376	***
SN	<---	Important expect	1	0,791			
PBC	<---	If I wanted	1,097	0,731	0,123	8,933	***
PBC	<---	For me, eating fish	1,101	0,812	0,121	9,077	***
PBC	<---	Personal control	1	0,735			
Attitude	<---	Negative/possitive	1,451	0,852	0,142	10,201	***
Attitude	<---	Bad/Good	1	0,721			
Attitude	<---	Unsatisfied/satisfied	1,275	0,773	0,129	9,852	***
Intention	<---	Plan	1	0,808			
Intention	<---	Expect	0,917	0,828	0,08	11,475	***
Intention	<---	Will	0,973	0,746	0,092	10,611	***

Appendix 6: Regression weight of belief model

			Estimate	Standerdized Estimate	S.E.	C.R.	P
Attitude	<---	Negative	-0,14	-0,139	0,06	-2,329	0,02
Attitude	<---	Quality	0,988	0,719	0,135	7,312	***
Attitude	<---	Availability	-0,057	-0,042	0,09	-0,632	0,527
Attitude	<---	Suitable	0,203	0,205	0,078	2,606	0,009
Attitude	<---	Time	-0,052	-0,047	0,08	-0,65	0,516
Attitude	<---	Value	0,038	0,033	0,082	0,47	0,638
PBC	<---	Value	0,201	0,19	0,097	2,064	0,039
PBC	<---	Availability	0,231	0,184	0,112	2,055	0,04
PBC	<---	Suitable	0,505	0,555	0,094	5,381	***
PBC	<---	Time	0,136	0,135	0,086	1,581	0,114
Bad/good	<---	Attitude	1	0,838			
Negative/positive	<---	Attitude	1,186	0,867	0,072	16,425	***
Sastified	<---	Attitude	1,22	0,906	0,068	17,819	***
Pleasant	<---	Attitude	1,217	0,951	0,063	19,357	***
Easy buy	<---	Availability	1	0,681			
Available	<---	Availability	1,443	0,865	0,742	1,946	0,052
Unpleasant bones	<---	Negative	1,519	0,915	0,165	9,203	***
Unpleasant smell	<---	Negative	1	0,609			
Difficult to remove bones	<---	Negative	1,404	0,873	0,152	9,234	***
If I wanted	<---	PBC	1	0,763			
For me eating fish	<---	PBC	0,878	0,769	0,083	10,564	***
Personal control	<---	PBC	0,815	0,708	0,085	9,628	***
Appearance	<---	Quality	1	0,665			
Taste	<---	Quality	1,274	0,822	0,151	8,416	***
Texture	<---	Quality	1,077	0,632	0,14	7,669	***
Prepare many dishes	<---	Suitable	1	0,704			
For delicious dishes	<---	Suitable	1,342	0,864	0,184	7,278	***
Cooking time	<---	Time	1	0,755			
Preparing time	<---	Time	1,387	0,988	0,776	1,788	0,074
Suit my budget	<---	Value	1	0,593			
Not expensive	<---	Value	1,378	0,818	0,743	1,855	0,064