

The role of perceived risk, knowledge, price and cost in explaining dry fish consumption in Bangladesh within the Theory of Planned Behaviour (TPB).

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Dedicated to

*My Dad-
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A b s t r a c t

Dry fish is the low-cost dietary protein source in Bangladesh. As far the concern of the researcher, this study is the first of its kind to explore the dry fish consumption behaviour in Bangladesh. The general purpose of this study is to apply the general framework of the Theory of Planned Behaviour (TPB), explain attitudes, intention and dry fish consumption in Chittagong city and to extend the traditional TPB-model with some additional variables; perceived risk, knowledge, price and cost.

The field experiments were performed in Chittagong city, Bangladesh with convenience sample of 208 respondents. The measurement scales used in this study were selected or adapted from previous studies. The study employs the methods of factor analysis, test of reliability, principal component analysis and multiple regression analysis to analyze the data.

The findings showed that attitude, norms and procedural knowledge emerge as the key determinants of intention, while intention, attitude, norms and perceived risk effect on the consumption frequency. PBC, price and cost had no significant effect on intention and dry fish consumption. Perceived quality is found as the most important attribute to forming consumers' attitude towards dry fish consumption. The proposed TPB and the extended model both of them fit well with the data and proved the expectations of this study in a promising way.

The study found that people are more concerned about potential long-term risk to their family and others. Therefore, management attention should focus on reducing risks with which consumers may be faced through producing safe and hazard free dry fish. A communication strategy should focus much more on improving procedural knowledge and signing food safety for consumers with lower knowledge than the others.

Key words: TPB, perceived risk, knowledge, price and cost, dry fish consumption, attitude and intention, Bangladesh.

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1. Introduction

Dry fish is low cost dietary protein source and used as a substitute of fish at the scarcity of fresh fish. About 15% of fishes are cured for mass people consumption at the scarcity of fresh fishes in Bangladesh (Ashraful and Khan, 2001). It is also a very favourite food item among Bangladeshi people and has a good market demand besides fish and seafood products. Some marine fish species people do not like to consume as fresh fish but they like to eat dry fish of these species (Siddique, 2007). Moreover, dry fish has a storage life of several years and is a great source of protein, essential fatty acids, vitamins and a lot of minerals (Siddique, 2007). So it is consumed all over the world for its nutritional value, taste, and aroma.

In the developed world, people are more concern about the risk and health issues (Redmond and Griffith, 2005). On the other hand, in the developing countries due to social inequality some consumers have higher purchasing power also conscious about health issues regarding intake of food (Petrovici *et al.*, 2004). At present, people are aware about health issues (Hossain, *et al.*, 2008) and higher income people are more concern about harmful and health hazardous food intake in Bangladesh. Dry fish are generally stored in dump warehouses. Therefore, during the monsoon period the dry fish absorb moisture rapidly and become suitable for infestation by beetles and mites. Therefore, the nutritional value and the physical properties of dry fish deteriorate with the increasing of storage period. Sometimes, fisher does not dry fishes properly due to loss of weight, as they want to make more profit. They use organochlorine insecticides such as DDT (dichlorodiphenyltrichloroethane), Heptachlor etc. for the fungal and insect infestation of dry fish. These insecticides are health hazard both for users and for consumers (Bhuiyan *et al.*, 2008). Therefore, consumers are now more concern to buy dry fish in Bangladesh. However, consumer's risk perception may not only be a physical issue, but also deal with other aspects such as social and financial consequences (Angulo and Gil, 2007; Lobb, 2005; Yuksel and Yuksel, 2007), products attributes (Ahamed, 2009; Angulo and Gil, 2007) and psychological properties (Angulo and Gil, 2007).

Knowledge about the quality of food is suggested to be of important motivational factor for consumer's attitudes and consumption when food are perceived to be risky and cause health problems for the consumers (Ahamed, 2009; Lobb *et al.*, 2007; Tuu

and Olsen, 2009). Knowledge about the nutrition and the production process also is an influencing factor for consumption, as most of the consumers in developing countries do not have adequate knowledge on nutritional value of different foodstuffs and the production process. In Bangladesh, dry fishes are prepared and storage in an unhygienic condition and adding poisoning substance for long time preservation might causes various human diseases even liver cancer. However, knowledge is also suggested as an internal resource for evaluating the quality and the production process of the food items. Knowledge about nutrition also has a significant role in health and healthy eating (Olsen, 2004). In case of Bangladesh, 61.3% people are literate (BANBEIS, 2011) but very few people are conscious about the nutritional value of dry fish but knowledge about the production process of dry fish is still unclear to most of the consumers.

In low-income countries, price and cost are crucial in forming food choice (Ahamed, 2009). Consumers in Bangladesh use 59.9 % of their income on food (Andrew *et al.*, 2010). In most countries, fish is expensive rather than dry fish. Around 40% of people in rural areas live in poverty in Bangladesh (Holmes *et al.*, 2008) and are not able to buy meat and fish regularly. Previous research demonstrated that the price level affects to the intention of fish consumption (Brunsø, 2003). As the dry fish is cheaper than the fresh fish, so price and cost is significantly correlated with the intention and behaviour of buying dry fish among Bangladeshi consumers though it has perceived risk.

1.1 Theoretical approach

As far the concern of the researcher, this study will be the first of its kind to explore the dry fish consumption behaviour in Bangladesh. Why do consumers buy or consume dry fish? How do their preferences, risk, knowledge and price influence their consumption? However, in the domain of food psychology and consumer behaviour, several theoretical approaches, theories and models are use explain and explore why individuals and households consume different kinds of food included fish or seafood (Furst *et al.*, 1996; Olsen, 2004; Tuu *et al.*, 2008; Verbeke and Vackier, 2005). For example do we find theories that propose that food consumption behaviour will be influenced by three interrelating categories of factors; physical properties of the food (quality and sensory attributes), characteristics of the individual (personality,

preferences, attitudes, knowledge) and characteristics with the environment (availability, season, situation, culture) (Olsen, 2001; Shepherd, 1989; Shepherd and Sparks, 1994).

Among theoretical models with empirical support, the Theory of Reason Action (TRA), the Theory of Planned Behaviour (TPB) (Ajzen, 1991; Fishbein and Ajzen, 1975) and Food Choice Questionnaire (FCQ) (Fotopoulos *et al.*, 2009) are probably the most popular models (Povey *et al.*, 2000; Saba and Natale, 1999; Saba and Vassallo, 2002; Tuu *et al.*, 2008; Verbeke and Vackier, 2005). The far most popular is the Theory of Planned Behaviour, which explains intention and food consumption by attitude, subjective norms and perceived behavioral control variables (see Olsen, 2004 and Olsen *et al.*, 2008 for a review).

Even though the traditional TPB variables have been powerful to explain and predict individual behaviour (for a review, see Conner and Armitage, 1998), several recent studies have included additional variables on behaviour such as perceived quality (Olsen, 2004), moral norms (Saba and Vassallo, 2002; Shepherd and Raats, 1996; Steptoe *et al.*, 1995), descriptive norms, social identity (Olsen, 2004; Rozin, 1995; Steptoe *et al.*, 1995), perceived risk (Ahamed, 2009; Lobb *et al.*, 2007; Tuu and Olsen, 2009), knowledge (Ahamed, 2009), and habit (Bruijn *et al.*, 2008; Mahon *et al.*, 2006; Saba and Natale, 1999; Tuorila and Pangborn, 1988a) in order to give a broader understanding of food attitudes and consumption.

1.2. Research objectives

Very few relevant studies in explaining the food or seafood consumption behaviour has been done in the context of Asian developing countries (Tuu *et al.*, 2008). The first main objective of this study is to apply the general framework of the Theory of Planned Behaviour (TPB) explain, attitudes, motivation (intention) to consume and dry fish consumption in Bangladesh. Because of budget restrictions, the empirical study will be narrowed to consumers in Chittagong city.

Risk perception is previously included within the TPB framework (Ahamed, 2009; Lobb *et al.*, 2007), and will be included in this study because it could be affect directly to the intention and behaviour (Yuksel and Yuksel, 2007). On the other hand, consumer knowledge is a powerful construct in explaining or predicting consumer's

consumption behaviour and closely related with risk perception of the consumer (Ahamed, 2009; Klerck and Sweeney, 2007; Tuu and Olsen, 2009). Price and cost is an important variable in explaining consumer's buyer behaviour (Brunso, 2003 and Bower *et al.*, 2002) or food choice (Ahamed, 2009), particularly in a country where households use more than half of their income on food. Thus, the second objective of this study is to extend the traditional TPB-model with some additional variables; perceived risk, knowledge and price and cost. Factors I believe will be of particular relevance for the context of this study.

1.3. Method

To investigate the attitude and motivation as per the conceptual model a survey was conducted in Chittagong city, Bangladesh. A convenience sample of 208 respondents was used to collect data. The questionnaire was constructed to assess attitudes towards the consumption of dry fish, and to measure perception of risks, knowledge, price and cost. Questions on beliefs, attitudes, and intention of consumption are based on the Ajzen and Fishbein's model (1991). Upon the data collected through the consumer survey, the reliability of the construct was tested. To analyze the data sets descriptive analysis was used and that will explore the general pattern. Then principle component analysis (PCA) and multiple regression analysis were used to draw the final conclusion and discussion. Statistical software SPSS 16.0 and Minitab 16 were used in this study.

1.4. Outline of the Thesis

Chapter 1 is the introductory chapter. After this introduction chapter, the theoretical and conceptual framework of the research is discussed in the Chapter 2. Chapter 2, briefly introduces the Theory of Planned Behaviour (TPB), and then discusses the different aspects of the constructs within the framework, and other factors, such as perceived risk, knowledge, price and cost. Data and method is discussed in the Chapter 3 focusing on the measures, techniques for testing reliability and multiple regression analysis. Chapter 4 presents the results from data analysis and model establishments. Finally, Chapter 5 discusses issues related to the results, conclusion and suggestions for future research.

2. Conceptual framework

In the domain of food psychology is very complex to explain food consumption behaviour (Fotopoulos *et al.*, 2009; Olsen, 2001, Olsen, 2004; Saba and Natale, 1999; Shepherd and Raats, 1996; Tuu *et al.*, 2008). Many different models within an extension of interrelated factors or variables took into account to explain consumer behaviour towards fish or seafood (Ahamed, 2009; Olsen, 2004; Verbeke and Vackier, 2005). The Theory of Reasoned Action (Fishbein and Ajzen, 1975), the Theory of Planned Behaviour (Ajzen, 1991; Olsen, 2001; Scholderer and Grunert, 2001), the Model of Buying Behaviour of Food Products (Acebron *et al.*, 2000) and the Behavioral Perspective Model (Leek *et al.*, 2000) has been designed to explain food consumption behaviour.

As discussed in the first chapter, the Theory of Planned Behaviour (Ajzen, 1991) is used as a conceptual framework; along with the TPB model, the incorporation of risk, knowledge, price and cost will make the final conceptual model. This section will discuss a brief introduction of TPB model at beginning and the detailed aspects of the constructs within TPB model will be discussed there in after.

2.1 The Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) has been held to be a sufficient and powerful model in explaining or predicting behaviour (Ajzen, 1991) and has successfully attracted wide application and empirical support to several food consumption behaviours (Tuu *et al.*, 2008; Conner and Sparks, 1996). The TPB originated from the earlier Theory of Reasoned Action (TRA) (Ajzen, 1991; Fishbein and Ajzen, 1975; Petrovici, *et al.*, 2004). The TRA states that one's intention to perform behaviour is positively influenced by the attitude towards performing the behaviour and subjective norms (Ajzen, 1991; Bonne *et al.*, 2007; Petrovici, *et al.*, 2004; Saba and Vassallo, 2002). Attitude refers to the favourable or unfavourable evaluation of a person has towards the behaviour and subjective norm refers to the perceived social pressure to perform or not perform behaviour. In order to extend the scope of the TRA to behaviours', the perceived behavioral control construct was introduced as a third predictor of behavioral intention. Perceived behavioral control reflects the perceived ease or difficulty of performing a particular behaviour and has a direct influence on

behaviour, which is not mediated by intentions (Ajzen, 1991; Bruijn *et al.*, 2007; Courneya *et al.*, 2006). The components of TPB model as well as their relevance with food consumption issue are discussed in the following paragraphs of this study.

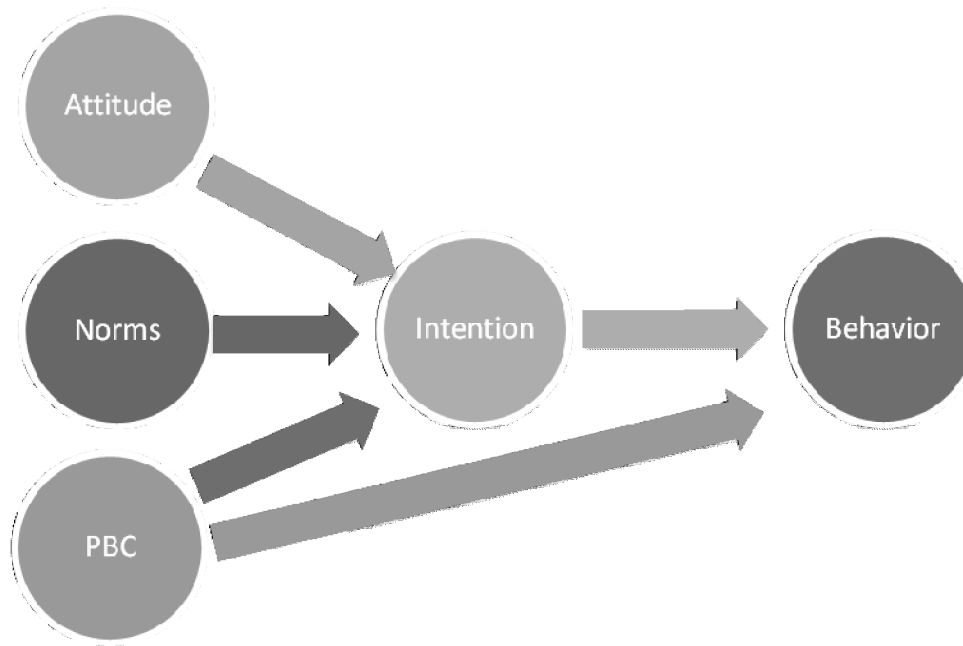


Figure 2.1 Theory of Planned Behaviour (Ajzen, 1991)

2.1.1 Intention and consumption

The intention construct is central to both the TRA and TPB concept and has seen as the most proximal predictor of behaviour (Ajzen, 1991). Intentions are often used as a behavioral indicator within the Theory of Planned Behaviour to predict behaviour (Olsen, 2008) or to estimate a potential demand for new products (Lilien and Kotler, 1983). Intentions are assumed to capture the motivational factors that influence human behaviour within several models in psychology and food science (Ajzen, 1991; Eagly and Chaiken, 1993; Saba and Vassallo, 2002). Intentions are often defined as indications of how hard people are willing to try and how much effort they are planning to exert, in order to perform the behaviour (Ajzen 1991; Armitage and Conner, 2001).

There are three antecedents of intention: attitudes, subjective norms and perceived behavioral control (see Ahamed, 2009 for an overview). Intentions are seen as a function of attitudes, subjective norms and perceived behavioral control related to that specific behaviour (Ajzen, 1991; Ajzen and Driver, 1991; Ajzen and Fishbein, 1980). Ajzen (1991, p. 188) states that: ‘The relative importance of attitude, subjective norm, and perceived behavioral control in the prediction of intention is expected to vary across behaviours and situations’. That is, in situations where attitudes are strong, or where normative influences are powerful, PBC may be less predictive of intentions (Armitage and Conner, 2001).

Fundamentally, intentions are considered as behavioral plans with the presence of resources and opportunities in performing a behavioral goal (Conner and Armitage, 1998). A number of food studies are found that the overall correlation between intentions and behaviour was 0.53 (Sheeran 2002, Honkanen et. al., 2006 for a review). It is observed that very few researches in predicting the relationship in between the intention and the behaviour measured by observation of food study (Saba and Natale, 1999). Tuu *et al.*, (2008) argued that intention have a significant effect on behavioral frequency.

This study defines intention as a motivational dimension of dry fish consumption and assumes intention is positively affected by attitude, subjective norms, and perceived behavioral control. It also assumes that intention of buying dry fish has a positive relationship with dry fish consumption behaviour. In this study, behaviour is defined and measured as the individual’s frequency of dry fish consumption as a self reported indication of past behaviour and does not differentiate the actual and perceived behaviour.

2.1.2 Attitude

In broader sense, attitudes are general evaluative constructs; used in measuring personality, values or lifestyles, and benefits or preferences (Honkanen *et al.*, 2004). In general, attitude is defined as a psychological tendency that is expressed by evaluating a particular entity (e.g. a food product) or object with some degree of favour–disfavour, liking–disliking, satisfaction–dissatisfaction or good–bad polarity (Eagly and Chaiken, 1993; Ajzen, 2001).

Traditionally, attitudinal responses can be divided into cognitive (thoughts), affective (feelings) and conative (or behavioral) responses (Honkanen *et al.*, 2006). The most prevalent view on the attitude is beliefs as a cognitive component, attitude as an affective component and behavioral intention as a conative component (Eagly and Chaiken, 1993; Fishbein and Ajzen, 1975). The dominating properties of attitude are evaluative property, attitude strength, and informational base of attitude. The evaluative property refers to how positively or negatively the person feels toward the object, attitude strength is defined as they are stable over time, to be resistant to persuading behaviour and the informational base of the attitude refer the extent to which they are based on different types of information i.e. cognition, affect etc. (Fabrigar *et al.*, 2005; Ajzen, 2001).

Ajzen (1991) argued that human behaviour is a function of salient information, or beliefs which is relevant to the behaviour (Ajzen, 1991). *Salient beliefs* are considered as the main determinant in forming the general attitude towards an object (Ajzen, 1991; Fishbein and Ajzen, 1975). 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 and Ajzen, 1975). Salient beliefs are distinguished as behavioral beliefs, normative beliefs and control beliefs. Behavioral beliefs refer the influence attitudes toward the behaviour; normative beliefs constitute the underlying determinants of subjective norms and the control beliefs provide the basis for perceptions of behavioral control (Ajzen, 1991).

According to Aikman *et al.*, (2006) food attitudes are categorized into five distinct bases such as positive affect (e.g., calm, comforted), negative affect (e.g., guilty, ashamed), abstract cognitive qualities (e.g., healthy, natural), general sensory qualities (e.g., taste, smell), and specific sensory qualities (e.g., salty, greasy). He also argued that these five motivational factors describe food attitudes better than a more traditional affective/cognitive attitude structure. A number of studies have argued that health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity (Steptoe *et al.*, 1995) and ethical concern (Martins and Pliner, 1998, Rozin, 1995) are the influencing factors of general food choice (Evans and Cox, 2006 for review). In some European countries, freshness and price are the most important attribute in food choice (Pertovici *et al.*, 2004). It is also recognized that food availability and cultural factors are dominant in food selection (Steptoe *et al.*, 1995).

Cultural influences and traditions lead to differences in the habitual consumption of certain foods (i.e. dry fish).

However, attitudes are treated as fundamental concept (Olsen, 2004, Tuu *et al.*, 2008) and suggested to be one of the most important determinants of explaining food consumption behaviour (Shepherd and Raats 1996). Olsen (2004) found, taste, distaste, nutrition (Steptoe *et al.*, 1995) and quality/ freshness are the four salient beliefs, reasonable for general evaluation of seafood or food consumption attitude (Olsen, 2004). Concerning the quality of the dry fish texture is the prime determinate, as people can easily understand the quality of dry fish by observing the texture. Taste or distaste issue is more important for food choice among young consumers and health and nutrition preference is a motivational factor for food selection of the elder consumers (Berg *et al.*, 2000; Olsen, 2004; Roininen *et al.*, 1999; Shepherd, 1989). After the taste issues the nutritional aspects have been found to be the second prominent factor that affect consumer's food attitude, which is directly related to health and healthy eating behaviour (Olsen, 2001). Olsen (2004) argued that some attributes or beliefs contribute only negatively to the development of food attitudes i.e. unpleasant smell and bones. This study will define and assess attitudes as both a general evaluation of attitudes toward consuming dry fish and will assess different beliefs about dry fish such as taste, distaste, smell, texture, nutrition and healthiness.

2.1.3 Social Norms

Social norms are often defined as the perceived social pressure or expectation of specific group of people or society (subjective norms) or individuals (normative beliefs) (Fishbein and Ajzen, 1975; Olsen, 2004). Social factors have been considered to be more important influencing factor than genetic factors in the development of individual food preferences (Rozin 1995). Normative beliefs are the salient feature in forming subjective norm (Ajzen, 1991). A number of researchers found that subjective norm is the weakest predictor of intention and behaviour (Ajzen, 1991; Armitage and Conner, 2001, Tuu *et al.*, 2008). Due to inadequacy and rare predictability of this constructs some researchers deliberately remove or suggest to removing subjective norms from food consumption behaviour models (Armitage and Conner, 2001 for a review). A number of researchers also suggested to identifying the dimensions of the subjective norms such as descriptive norms and moral norms for

enhancing the predictability of this construct within the TPB model (Armitage and Conner, 2001; Donald and Cooper, 2001; Sheeran and Orbell, 1999; Tuu *et al.*, 2008 for a review). Descriptive norms have contributed to the prediction of intention independently (Tuu *et al.*, 2008 for a review) but social norms failed to significantly predict intention (Ajzen, 1991).

Family environment and peers are major determinants of children and teenagers' food preferences (Rolls, 1988). In case of food/seafood consumption behaviour family expectation, moral obligations, health involvements and culture are determined as the main antecedents of social norms (Olsen, 2001, Olsen, 2004, Verbeke and Vackier, 2005). In some countries (e.g. Bangladesh, India, Vietnam etc.) dry fish consumption is treated as a part of their culture. Sometimes, dry fish is served in the family meal for getting variation of taste and flavor in as usual meal. In Bangladesh, women are preparing meal for the family members and give preference to what kind of food most of the family members like to have in their meal. Nevertheless, in some case, low-income families where they eat by hand to mouth, do not have any option to choose or reject a particular food and all the family members have to be obeyed to the family food preference, as individual choice is not influence their family meal decisions. In this study, subjective norms are defined as social pressures and family expectations that determine the behavioral intentions in consuming dry fish. However, the concept of subjective norms will only be assessed in this study but not be focused on normative or individual beliefs.

2.1.4 Perceived Behavioral Control (PBC)

Perceived Behavioral Control (PBC) is an additional predictor of behaviour, which reflects to person's perception of the perceived ease or difficulty of performing behaviour (Ajzen, 1991; Olsen, 2004). Ajzen (1991) argued that PBC has a direct effect on predicting a particular behaviour, which is not mediated by intentions. Thus, the PBC influence both behavioral intention and behaviour (Ajzen, 1991). The control beliefs are considered as the third group of salient beliefs that result perceived behavioral control (Ajzen, 1991, 2001, Pawlak and Malinauskas, 2008). Control beliefs refer the hardness or difficulties perceived by the individuals to the behavioral performance (Pawlak and Malinauskas, 2008). Availability of the resources and the self-confidence are the two main components of PBC (Ajzen, 1991). It is assumed

that the person's has more resources and opportunities, should have greater perceived control over the behaviour (Olsen, 2004). According to Ajzen, the control factors to perform behaviour can be internal or external to the person. Person's internal factors can be skills, knowledge, lack of abilities, willpower, and compulsion and the external factors can be time, opportunity, situation, dependence on others (Ajzen, 1991).

Among the most important control factors that influence consumers' seafood purchasing behaviour include price/cost, convenience/availability and knowledge (Olsen, 2004). Fish is treated as an inconvenient food item (Gofton, 1995). The preparation and cooking procedure of dry fish is also complex as same as fish. Fish and some fish products (e.g. dry fish) are not convenient as it consumes much more time to cook. Gofton (1995) argued that inconvenience and scarcity are significant barriers to consuming fish. In case of dry fish, it is not available everywhere throughout the year. Therefore, availability could be a significant barrier for dry fish consumption.

Suitability could be an important factor of consuming dry fish. Dry fish is not suitable to prepare some types of food items and avoid in some special meal (e.g. wedding party, religious occasion etc) because the acceptability of dry fish is not same like meat and fish among the consumers. Knowledge is also an important factor in seafood choice and consumption (Olsen, 2004). Knowledge about the raw materials of food, production process and cooking or preparing procedure is linked with food choice. In case of fish/ fish product (e.g. dry fish), knowledge is linked with the quality (Olsen, 2004). In this study, the PBC construct is demonstrated as an integrated component of internal and external control factors such as convenience, availability and suitability that could be influence dry fish consumption.

2.2 Perceived Risk

The concept of risk is important for predicting consumer's choice and proposed as the core concept for consumer theory (see Conchar *et al.*, 2004 for a review). Risk is one of the main propositions in the study of consumer behaviour since 1960's (Dowling and Staelin, 1994). Risk perceptions refer a person's views about different risk inherent in a particular situation of the consumer but in case of food, it refers the individual believes about the health risk issue from consuming a food product. It also refers to how willing a person is to accept risk of consuming food products. (Ahamed,

2009). Consistent with recent relevant literature, risk perception is defined as people's cognitive and affective responses are or might be exposed to food hazards. This definition incorporates feelings or emotional components (e.g. uncertainty, worry, anxiety) and probability of occurrence (subjective risk assessment) (See Pieniak, *et al.*, 2008 for a review). This multidimensional construct is being conceptualized differently in different field of studies according to the context of study (Conchar, *et. al*, 2004; Yuksel and Yuksel, 2007). However, in the consumer behaviour literature perceived risk is being conceptualized as involving two distinct components; uncertainty and consequences (Conchar, *et. al*, 2004; Dowling and Staelin, 1994; Grewal, *et. al.* 2007; Klerck and Sweeney, 2007; Yuksel and Yuksel, 2007). The first component that captures the consumer's perception of the risk of buying "an average product" refer as product category risk and the second one is termed as product-specific risk. Within such a framework, perceived risk is associated to a distinct product or product category (Tuu and Olsen, 2009).

In modern consumer studies perceived risk has been used frequently as an explanatory variable (Dowling and Staelin, 1994). A number of studies found that consumer's perception of risk comprises many aspects (e.g. health concern, emotional pressure) of psychological risk and influenced by product properties or products attribute (Yeung and Yee, 2002 as cited in Tuu and Olsen, 2009). Valla (1982) identified five categories of risk perception with which a consumer must contend. These were technical risk, financial risk, delivery risk, service risk, and risk related to supplier/customer long-term relationships. Moreover, different types of perceived risk have been identified in food studies by a number of researchers that includes, functional (the product does not provide expected performance), financial (losing or wasting income), performance (does not satisfied the need or quality), physical (illness or injury), psychological (damages of self-esteem or endangers guilt) and social (unfashionable/ backdated or lower status) (Klerck and Sweeney, 2007; McCarthy and Henson, 2005; Yuksel and Yuksel, 2007; Angulo and Gil, 2007; Tsiros and Heilman, 2005 as cited in Ahamed, 2009).

The importance of consumers risk perception is very much crucial as it could be affect directly to the purchase and purchasing intention (Yuksel and Yuksel, 2007). Price and cost also have a significant role in predicting consumer's perceived risk in case of food consumption (Ahamed, 2009). Risk is often viewed as an antecedent of

involvement (Choffee and McLeod, 1973 as cited in Mitchell, 1998) when the product price is high and the consumer risks losing money. A number of studies suggested that higher price tends to higher perceived risks (Angulo and Gil, 2007) and fairly low-cost convenience food and nonfood stuffs have minimal perceived risk (Mitchell, 1998). However, in the present study, risk perception is defined in terms of the consumer's perceptions of the uncertainty and adverse consequences of purchasing dry fish and will be investigated from the view of physical attributes of dry fish, financial, physical (health issue) and psychological properties and social approach.

2.3 Knowledge

Consumer knowledge is one of the main motivational dimensions in explaining consumer behaviour (Klerck and Sweeney, 2007). A number of empirical researches have identified two different categories of knowledge as such subjective knowledge and objective knowledge. In general, subjective knowledge can be defined as "person's perception of the amount of information or knowledge about a product class stored in his or her memory which can be over or under estimated as including in the person's degree of confidence in his/her knowledge". On the other hand, objective knowledge is defined as "pertains to the actual level of accurate information or knowledge stored in his or her memory" (Ahmed, 2009; Chiou, 1998; Jayampathi, 2010; Klerck and Sweeney, 2007). Though these two categories of knowledge are related each other (Chiou, 1998).

Consumer knowledge is suggested to influence how consumers gather and organize information about the product and how they choose and buy the product and how they use them (Alba and Hutchison, 1987). In case of dry fish, knowledge about nutrition might be a significant motivational dimension of consumption as dry fish contains higher amount of protein and minerals (Siddique, 2007). Empirical studies suggests that the positive perceptions closely related to the individual's daily life experiences and negative perceptions about food items arise from beyond the individual's experiences on the basis of the individual's knowledge of the issue (e.g. Genetically Modified Foods). It is proven that more correct knowledge about the food items have fewer perceive risk (Chen and Li, 2007).

In food study, consumer knowledge has been suggested as a motivational factor influencing risk assessment and food consumption (Frewer *et al.*, 1994). Product and

production knowledge often plays negative influence towards some food items. In Bangladesh, consumers are more concern about how to make the food products and what type of preservatives are used for long time preservation of that food, as people do not like to intake any health hazard chemical with their food. Knowledge about unsafe food handling practices (e.g. using formalin on fish) could lead to change in consumer behaviour (Redmond and Griffith, 2005). The production knowledge about dry fish might influence the consumption of dry fish as sometimes it is made in unhygienic condition and health hazard elements are used for long time preservation of dry fish.

Olsen (2004) argued that consumer knowledge about food is an internal resource that can be linked to several aspects such as evaluating the quality and the preparing procedure of food (Olsen, 2004). In Bangladesh, women are prepared food for their family. Knowledge about preparing of food has been identified as a barrier in case of seafood consumption (Olsen, 2004). The cooking or preparing procedure of dry fish is difficult and consume more time rather than fish and seafood. Thus, it is assumed that the procedural knowledge (preparing and cooking) might be a barrier in consuming dry fish in most of the families in Bangladesh.

However, in this study, knowledge will be defined as the product attribute or nutritional knowledge, the production knowledge and the procedural knowledge of consuming dry fish by the consumer. The product knowledge will include knowledge about the quality (dry /wet/fresh/old) and nutritional knowledge and the procedural knowledge include the preparing and cooking of dry fish.

2.4 Price and cost

In general, the concept of price can be defined as the monetary price paid for the product with the time, energy and effort involved in acquiring the product by the consumer. Zeithaml (1988) defines price as “*what is given up or sacrificed to obtain a product* (Zeithaml, 1988 as cited in Toften and Olsen, 2004).” Cost means the total amount of expense to obtain a product or service. On the other hand, perceived values are similar to attitudes (Homer and Kahle, 1988). Perceived Values are the most useful abstract of the social cognitions in the examination of the consumer’s motives (Munson, 1984) for understanding behaviour (see Rajani, 2010 for a review). Some researchers define and measure value as a relative variable, including price or

value for money, whereas others assess price or cost as a separate dimension along with quality (see Toften and Olsen, 2004 for a review). However, price is defined as the value of product in this study, which is different from perceived value or individual perceptions.

Price of the food has a great influence in food preference (Steptoe *et al.*, 1995). Fish / seafood are expensive in many countries (Olsen, 2004) where price level influences the behavioral intension of purchasing fish / seafood (Brunsø, 2003; Olsen, 2004; Pertovici *et al.*, 2004; Verbeke and Vackier, 2005). Low-income people cannot afford to buy costly food items. In case of dry fish, it is cheaper than fresh fish and affordable by all consumers (e.g poor consumers). A number of studies proved that price and cost is not a barrier to seafood consumption and there is no direct effect of price on consumption level (Olsen, 2004; Verbeke and Vackier, 2004).

In Bangladesh, dry fish is considered as a low cost dietary protein source at the scarcity of fish. Low income categories people prefer to consume dry fish rather than consume fresh fish due to its lower price. Therefore, in this study, price and cost is not considered as perceived behavioral control and illustrated as an additional variable within the TPB model. Here price is defined as monetary value of the product that influences the behavioral intention of dry fish consumption.

2.5 The conceptual model

Food preferences are influenced by sensory characteristics and some non-sensory factors, which include the attitudes and mood of the individuals, price, health and ethical concerns (Prescott *et al.*, 2002). Some psychological and physiological factors, interpersonal and social factors also influenced in food preference (see Fotopoulos, 2009 for a review). In some cases, cultural influences might affect on consumers food selection and food habit during consumption of certain foods (Lau, Krondl and Coleman, 1984). The purpose of the theoretical discussion given above is to clarify various concepts and to form a conceptual model for this study. The research assumptions of this study have built on the Theory of Planned Behaviour (TPB) model. Theory of Planned Behaviour (TPB) is one of most influential and powerful structured framework in predicting and explaining human behaviour (Ajzen, 1991).

Ajzen (1991) states that: '*The relative importance of attitude, subjective norm, and perceived behavioral control in the prediction of intention is expected to vary across behaviours and situations*'. A meta-analytical review conducted by Armitage and Conner (2001) proved that the Theory of Planned Behaviour model accounted for 27% variance in behaviour and 39% variance in behavioral intention (Armitage and Conner, 2001; Conner and Abraham, 2001). A parallel meta-analysis review by Ajzen (1991) found an average multiple correlation of attitude, subjective norm and PBC, with intention of $R = 0.71$ (19 correlations), and an average multiple correlation of $R = 0.51$ (17 correlations) for prediction of behaviour from intention and PBC. However, Ajzen's meta-analyses considered only the direct antecedents of intention and behaviour. A meta-analysis by Godin and Kok's (1996) found that PBC contributed a mean additional 13% of variance to the prediction of intentions and 12% to the prediction of behaviour where Armitage and Conner (2001) proved that PBC accounts for an average of 6% of the variance over and above attitudes and subjective norms (Armitage and Conner, 2001). However, the TPB model seems more predictive and has been applied to food and seafood studies (Ahamed, 2009; Mahon *et al.*, 2006; Olsen 2004; Verbeke and Vackier, 2005).

The TPB model has been extended by many researchers. A number of researchers included perceived risk (Ahamed, 2009; Lobb *et al.*, 2007), Knowledge (Ahamed, 2009), price and cost (Tarkiainen, 2005) with TPB model as a conceptual framework in their study. Based on theoretical review, TPB will be used as the fundamental framework of this study and expected to model the average relation among the global variables and the behavioral intention and ought to investigate whether these relations vary according to other factors. In the conceptual model, perceived risk, knowledge, price and cost will be used within TPB attributes to explore the consumer's intention and behaviour of dry fish consumption in Chittagong city. However, the extension variables will clarify the role of perceived risks and its consequences on attitude and behaviour. Different types of risk category will be used in this study to get the clear picture of the perceived risk. It is assumed that knowledge about the product, nutritional knowledge and procedural knowledge is correlated with risk and intention of consume dry fish. Therefore, knowledge will be included in the conceptual model as it shapes the risk and intention of the consumers. A number of studies suggested price as a personal control of fish and seafood consumption (Ahamed, 2009; Olsen,

2004. Nevertheless, in case of dry fish, it is a low cost food item among the poor consumers. However, it is suggested that price is not a control barrier for consumption of dry fish. Therefore, price is used in this study as an additional variable to explore the relationship with intention and behaviour. Ajzen (1991) proposed that behavioral beliefs are the main determinants of attitude (Ajzen, 1991). This study will also explore the attribute belief model, for attitude and control beliefs. Here perceived quality, healthiness and negative affects are considered as determinates of attitude (Ahamed, 2009; Olsen 2001; 2004; Verbeke and Vackier, 2005); while convenience, availability and suitability is considered as the important control factors that influence consumers' purchasing decision (Olsen, 2004). The conceptual model is illustrated in Figure 2.2.

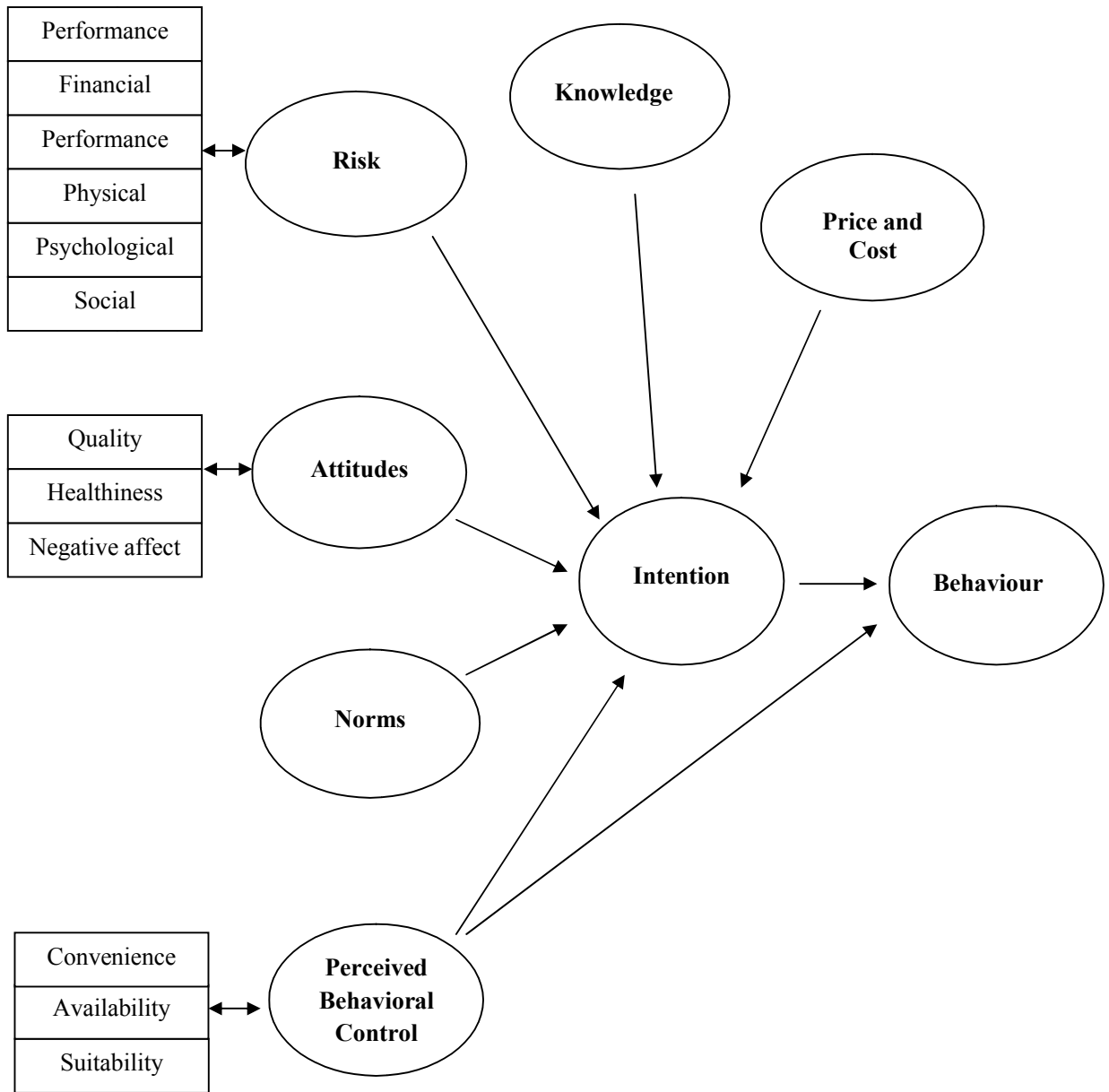


Figure 2.2 The analytical model

In testing the basic model, it is assumed that all relationships within TPB are significantly positive, which were confirmed by many empirical researches (Ahamed, 2009; Ajzen, 1991; Fishbein and Ajzen, 2005; Verbeke and Vackier, 2005).

More specifically, the following relationships are expected:

- (1) Dry fish consumption is significantly determined by intention and perceived behavioral control.
- (2) Intention is significantly determined by attitude, social norm, perceived behavioral control, risk, knowledge, price and cost.
- (3) The beliefs about quality, healthiness and negative affect have a significant impact on general attitude.
- (4) Control beliefs such as convenience, availability and suitability have significant impact on personal control.
- (5) Six categories of risk perception of the consumers determine perceived risk.
- (6) The knowledge construct involves both product and nutritional knowledge and procedural knowledge.
- (7) Price and cost correlated with intention and dry fish consumption behaviour.

3. Methodology

The process of data collection, questionnaires and analysis methods are discussed in this chapter of the thesis. In this part, the emphasis was given for designing items to measure the constructs. Factor analysis, testing for the reliability of constructs, descriptive analysis, Principal component analysis and multiple regression analysis are the main methods discussed in this section.

3.1 Survey design and procedure

In the literature, two broad categories of sampling methods can be found as probability and convenience sampling. Convenience sampling or non-probability sampling is mainly applied due to convenience of accessibility. Probability sampling methods includes sub categories as random, stratified, cluster, and multistage sampling methods (Yu and Cooper, 1983). It should be noted that this study use the convenience sampling with focusing ease of access to the respondents in the research area.

Besides the TPB constructs, the questionnaire was measured some additional constructs such as perceived risk, knowledge, price and cost. The measurement items belongs to each constructs used in this study were adopted from previous researches in the literature. Seven point Likert scale, semantic differential scale and multiple rating list scale (Malhotra, 2006, Honkanen and Olsen, 2009) was used to measure the items under the constructs. The reliability of the scales was assessed by Cronbach's Alpha.

By using convenience sampling method, the research was conducted in the Chittagong city (the business city of Bangladesh adjacent the Bay of Bengal) in February 2011. A random sample of 250 respondents was selected and 208 of usable questionnaires could be obtained from the survey. Thus, the results are not necessarily representative of the whole population. The respondents were personally interviewed at their residence or work place and to complete a questionnaire. Beside the English version of the questionnaire, a Bengali version of questionnaire also developed for the uneducated respondents. First the researcher explained this motive and importance of the research to the respondent. After that the interview was conducted question by question. While explaining the questionnaire the researcher was careful about not to

being biased or not to influence the respondent. In some cases, data were collected by personally delivering the questionnaire to the respondents at their residence or work place and then collected it later at agreed upon time and several help mates are used to collect the questionnaire form.

3.2 Measurement

This part of the thesis discusses the measuring procedure of the constructs and attributes. The measurement items belongs to each constructs used in this study were adopted from previous researches in the literature. In most of the cases 7 point Likert scale, Semantic differential scale and Multiple rating list scale (Malhotra, 2006, Honkanen and Olsen, 2009) was used to measure the items under the constructs.

7 point Likert scale developed by Rensis Likert, which indicates how much the respondents agree or disagree with each of the statements about the stimulus objects (Malhotra, 2006). The Semantic Differential (SD) scale measures people's reactions to stimulus words attached with bipolar adjectives that have semantic meaning (Malhotra, 2006). The other multiple rating scales are mostly framed from “not important” to “very important”. The reliability of the scales was assessed by Cronbach’s Alpha.

3.2.1 Consumption and behaviours

In this study, dry fish consumption behaviour was measured as self-reported frequency of consumption during the last year. This self-reporting measures of this study parallel with previous studies (Ahamed, 2009; Olsen, 2003; Rajani, 2010). It is also needed to mention that here no specificity was given in species or product, context and time that the behaviour occur. In order to measure the frequency of the behaviour, measures were adopted from previous researches; here the researcher used a 1-year time frame with a 7-point scale in response to the question: “How many times in average during the last year you have consumed dry fish as a meal?” the scale was ranging from 1= never to 9= daily or almost every day. We adapted this measure from previous studies assessing food consumption frequency (Olsen, 2003, Verbeke and Vackier, 2005).

How often do you eat dry fish? Please mark only one answer.

1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	Max once a year	1-5 times every 6 months	Once a month	2-3 times a month	Once a week	2 times a week	3-4 times a week	Daily or almost every day

3.2.2 Intention to consume dry fish

Intention is defined as a measure of the likelihood that a person will engage in a given behaviour (Ajzen, 1991; Fishbein and Ajzen, 1975). In this study, intention is measured as motivation to consume dry fish in global level that is followed by previous studies. Moreover, intention is assumed as a mediator of the relationship between behaviour with attitude, norms, personal control, perceived risk, knowledge, price and cost in the conceptual model for this study. The respondents were asked to score the probability of their intentions coded from 1 (very unlikely) to 7 (very likely), and the midpoint 4 was the neutral estimation.

For some, expectations, planning and desires mean the same thing. For others, there is a difference between the terms. Could you please estimate how many times for the upcoming week you plan, want, expect and desire to buy or eat dry fish as a meal – including today?

	Very unlikely						Very likely
	1	2	3	4	5	6	7
For next week...							
I plan to eat dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I want to eat dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I expect to eat dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I desire to eat dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2.3 General attitude and attribute beliefs

Attitude toward a behaviour is defined as a person’s overall evaluation of performing the behaviour in question (Ajzen, 2002). Attitude toward dry fish consumption was firstly assessed as global evaluation without any specificity in times or context when the consumption occurs. In this study, five items were used to assess respondent’s attitudes toward consuming dry fish. The semantic differential scales are the most commonly used in measuring attitude (Ajzen, 2002; Ajzen and Madden, 1986) towards food consumption behaviour. As analogous to previous studies, the participants were asked to rate their feelings as “how you feel when you eat dry fish as a meal” on five 7- point semantic differential scales with bipolar adjectives varying from 1 (bad/ unsatisfied/ unpleasant/ dull/ negative) to 7 (good/ satisfied/ pleasant/ exiting/ positive) (Ahamed, 2009; Bogers et. al., 2004; Chiou, 1998; Olsen, 2003; Rajani, 2010, Tuu et. al., 2008, Verbeke and Vackier, 2005).

In the following, we would like you to think about how you feel when you eat dry fish as a meal. Please indicate for each row which word best describes how you feeling by putting one mark on each line.

When I eat dry fish, I feel.....

	1	2	3	4	5	6	7	
Bad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Good
Unsatisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Satisfied
Unpleasant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pleasant
Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exciting
Negative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Positive

In case of fish consumption, Olsen (2004) identified taste, distaste (negative affect), nutrition and quality / freshness are the four salient beliefs reasonable in forming attitude (Olsen, 2004). This study assessed some additional beliefs about dry fish such as taste, distaste, texture, smell, nutrition, healthiness and some negative affects. The items were coded in semantic differential formats with 7-points scale from “very bad” to “very good”.

How would you evaluate dry 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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Good taste
Bad texture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Good texture
Bad appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Good appearance
Unhealthy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Healthy
Not nutritious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nutritious

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

	Totally disagree			Neither agree nor disagree			Totally agree
	1	2	3	4	5	6	7
Dry fish has an unpleasant smell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is difficult to remove all bone out of dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The bones in dry fish are unpleasant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2.4 Social norms and expectations from others

Social norms are defined as the perceived social pressure or expectation from the society (subjective norms) or from specific groups or individual (normative beliefs) (Fishbein and Ajzen, 1975; Olsen, 2004). In consistence with the definition, this study defines norms as social pressure and expectation that impact on people’s preference and choice to consume dry fish in Chittagong city. The measurements of this construct were adopted from previous studies (Ahamed, 2009; Bogers et. al., 2004; Jayampathi, 2010; Olsen, 2003; Tuu et. al., 2008; Verbeke and Vackier, 2005).

For every proposition stated below, please indicate your agreement or disagreement.

	Totally disagree			Neither agree nor disagree			Totally agree
	1	2	3	4	5	6	7
My family expects me to eat dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My family wants me to eat dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My friends/relatives think that I should eat dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My friends/relatives want me to eat dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My culture/religion wants me to eat dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The construct assessed as the mean of five items in this study. Subjective norm was measured by asking the respondents to evaluate the items such as “My family expects me to eat dry fish”, “My family wants me to eat dry fish”, “My friends/relatives think that I should dry fish”, “My friends/relatives want me to eat dry fish” and “My

culture/religion wants me to eat dry fish”. The items were measured using a 7-point Likert-scale anchored from 1 = strongly disagree to 7 = strongly agree and at the midpoint 4 = neither agree nor disagree.

3.2.5 Personal control and control beliefs

According to Ajzen (1991), perceived behaviour control is the people’s perception of the perceived ease or difficulty of performing behavioral intention and engages the behaviour (Ajzen, 1991). This research assessed both external and internal factors that may be inferred from the performance of the act of consumption (Ajzen, 1991, Tuu et. al., 2008). The questionnaire had a general introduction explaining that there could be reasons and obstacles involving in eating dry fish for the meal at home, including availability, suitability in the meal, lack of time, and lack of skills or knowledge regarding its preparation. The combinations of these sorts of items are frequently used to assess the perceived behavioral control within domain of consumer psychology and/or social psychology (Tuu et. al., 2008) and food or nutrition behaviour (Olsen, 2004; Tuu et. al, 2008). The respondents were asked the following questions, as : (a) “How much personal control do you feel over eating dry fish?”, ranging from No control (1) to Complete control (7)”, (b) “For me, eating dry fish is”: ranging from Very difficult (1) to Very easy (7)”, and (c) “If I want I can easily eat dry fish tomorrow” with endpoints from Very unlikely (1) to Very likely (7).

There can be several reasons for not eating dry fish as a meal: availability of fresh fish, lack of time, knowledge of how to prepare dry fish, etc. will some examples. Could you please evaluate your general ability or inability to have or eat dry fish as a meal?

	1	2	3	4	5	6	7
	No control						Complete control
How much personal control do you feel over eating dry fish?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	1	2	3	4	5	6	7
	Very difficult						Very ease
For me to eat dry fish is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Very unlikely						Very likely
If I want, I can easily eat dry fish tomorrow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Olsen (2004) found the most important control factors that influence consumers' seafood purchasing include price/cost, convenience/availability and knowledge. In more detailed investigation of this study; availability, suitability and convenience were assumed as the main determinants of personal control over eating dry fish in Chittagong city. The items of convenience, availability and suitability constructs were presented in a 7 points bipolar scale ranging from very bad to very good and the midpoint 4 was the neutral estimation.

How would you evaluate dry 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	
Difficult to store	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Easy to store
Not Convenience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Convenience
Unavailable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Available
Difficult to buy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Easy to buy
Not suitable to cooking delicious meals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Suitable to cooking delicious meals
Not suitable to prepare many dishes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Suitable to prepare many dishes

3.2.6 Perceived Risk

This study defined and measures the direct impact of risk perception on the intention to purchase/consume dry fish as well as the influence of risk perception on behaviour. Based on a review of literature related to risk perception, six facets of perceived risk were discussed, as: functional, financial, performance, physical, psychological, and social (Ahamed, 2009; Angulo and Gil, 2007; Klerck and Sweeney, 2007; McCarthy and Henson, 2005; Tsiros and Heilman, 2005; Yuksel and Yuksel, 2007). Six statements were chosen to assess risk perception related to dry fish consumption. Questions were adopted from previous studies from the broader arena of food consumption research and respondents were asked to rate their risk perception in a 7-point Likert scale, where 1 denotes total disagreement of the statement and 7 denotes total agreement.

We are now suggesting several properties related to your risk perception upon buying dry fish. For every proposition, please indicate your agreement or disagreement.

In case of buying dry fish from traditional markets.....

	Totally disagree			Neither agree nor disagree			Totally agree
	1	2	3	4	5	6	7
When I buy dry fish I am concerned that it will not be as I expected (functional risk)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I were to purchase dry fish I would worry about losing/wasting money (financial risk)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I were to purchase dry fish I would worry about the product not tasting as good as it should (performance risk)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The thought of purchasing dry fish makes me feel psychologically uncomfortable (psychological risk)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I were to purchase dry fish I would become concerned about the potential long-term risks to my family, myself and others (physical risk)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Purchasing dry fish is unfashionable or symbol of lower status (social risk)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2.7 Knowledge

In general, consumer knowledge is identified into two different categories of knowledge such as subjective knowledge and objective knowledge (Ahmed, 2009; Chiou, 1998; Jayampathi, 2010; Klerck and Sweeney, 2007). In this study, it is assumed that product attributes or nutritional knowledge and the cooking procedural knowledge influence the intention of dry fish consumption. However, adapted from the previous studies the knowledge constructs is assessed and measured in two categories by using 7- point likert scale coded from 1= totally disagree to 7= totally agree, while 4= neither agree nor disagree (Ahamed, 2009; Chen and Li, 2007).

We are now suggesting several properties related to your knowledge upon buying dry fish. For every proposition please indicate your agreement or disagreement (Product and nutritional knowledge).

	Totally disagree			Neither agree nor disagree			Totally agree
	1	2	3	4	5	6	7
I know what kind of dry fish is safe and unsafe to eat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I know what kind of dry fish is healthy and unhealthy to eat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have good knowledge about what kind of nutrition dry fish contains	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I know what kind of dry fish is rich in nutrition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

We are now suggesting several properties related to your knowledge upon preparing / cooking dry fish. For every proposition, please indicate your agreement or disagreement (Procedural knowledge).

	Totally disagree			Neither agree nor disagree			Totally agree
	1	2	3	4	5	6	7
I find it easy to prepare delicious and tasty meals with dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My friends consider me as an expert on dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a lot of knowledge how to evaluate the quality of dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compared to an average person, I know a lot about the risk for eating dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My friends consider me as an expert on the risky aspect with eating dry fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a lot of knowledge how to evaluate the if dry fish is risky to eat or not	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2.8 Price and cost

Price of the food has a great influence in food preference (Steptoe *et al.*, 1995). In this study, price and cost will be explained as a positive motivational dimension of predicting dry fish consumption. Adopting from Steptoe *et al.* (1995), this study used four items about perceived value of fish consumption to assess the attributes of price and cost. The items are depicted in the following table:

We are now suggesting several properties related to price and value. For every proposition please indicate your agreement or disagreement.

	Totally disagree			Neither agree nor disagree			Totally agree
	1	2	3	4	5	6	7
Dry fish is not expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eating dry fish is good value for money	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I choose to eat dry fish because it is economical	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eating dry fish is suitable for my budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2.9 Sample

The majority of the sample was men (58.2%) of various ages (54.3% were under 30 years). Of all the respondents, 60.1% were single and 39.9% were married. 48.6% of household size is above 6 persons. The median of the sample income was in between BDT 200,000 – 300,000 (1 USD = 71 BDT). The following Table 1 depicted the socio demographic information (gender, age, marital status, education, and income) of the sample:

Table 3.1 Socio-demographic characteristic of the respondents (% of respondents, n = 208)

Gender	Male	58.2
	Female	41.8
Marital Status	Single	60.1
	Married	39.9
Household size	2-3 persons	20.2
	4-6 persons	31.2
	≥ 6 persons	48.6
Education	SSC	15.4
	HSC	19.2
	Graduate	55.3
	Post Graduate	10.1
Age	18-30 years	54.3
	31-45 years	35.1
	>45 years	10.6
Household Income (Annual)	≤ 200,000 BDT	36.5
	200,000-300,000 BDT	36.1
	300,000-50,000 BDT	18.8
	≥ 500,000 BDT	8.7
Profession	House wife	19.2
	Government Employee	9.1

	Privet Employee	21.2
	Business	31.7
	Others	18.8

3.3 Analytical methods and procedures

Exploratory factor analysis (EFA) is described as orderly simplification of interrelated measures. EFA, traditionally, has been used to explore the possible underlying factor structure of a set of observed variables without imposing a preconceived structure on the outcome. By performing EFA, the underlying factor structure is identified. On the other hand, Principal component analysis has been used to reduce variables and to construct composite items for multiple regression analysis. However, multiple regression analysis was used to draw the path diagram and to confirm the relationship of the constructs. The researcher uses knowledge of the theory, empirical research, or both, postulates the relationship pattern a priori and then tests the hypothesis statistically. This part of the thesis will discuss the analytical methods and procedures employed to accomplish the objective of the study. The analytical methods used are described in the following sections of this paper.

3.3.1 Exploratory factor analysis and test of reliability and validity of constructs

In the domain of research Exploratory Factor Analysis (EFA) is a powerful statistical technique used to determine the number of dimensions underlying the constructs (Churchill, Jr., 1979). The factor analysis is used to find latent constructs (sub-constructs) or variables among observed variables and to overall inspection of the convergent validity of proposed constructs. However, the factor analysis is also used to reduce the number of variables to a lesser number of underlying factors and structure detection by classifying all the variables with similar characteristics. There are several types of factor analysis has been used in previous research such as Principal component analysis, Canonical factor analysis, Common factor analysis, Image factoring etc (Jayampathi, 2010). In this study, Principal Component Analysis (PCA) with orthogonal rotation (Vorimax) is used for the purposes of overall

inspection of the convergent validity of proposed constructs considering the factor loadings of items and to explore the latent constructs (sub-construct) (Hair *et al.*, 1995). In general, factor loading is the correlation between a variable and a factor that has been extracted from the obtained data. The factors that have high loading factors of items indicate a good convergent validity of the measures in describing the same constructs (Hair *et al.*, 1995).

Bartlett's test of sphericity, and Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is performed to determine overall suitability of data for factor analysis. Bartlett test of sphericity suggests that the probability is less than 0.05 indicates the appropriateness of the factor analysis (Malhotra, 2006) and the KMO measures the sampling adequacy which should be greater than 0.5 (Pallant, 2005). The items need to have internal consistency to form a scale. It means that all items within the construct should measure the same things and the items should be correlated with each other (Hair *et al.*, 1995, Jayampathi, 2010). Therefore, after performing the Exploratory Factor Analysis the internal consistency (i.e. reliability) of the resulting factors was tested by Cronbach's alpha. Cronbach's alpha is a useful coefficient to investigate the internal consistency of the measures. In the social science research, the higher value of Cronbach's alpha refers the higher inter-correlations among measures and it indicates higher reliability of measurements (Ahamed, 2009, Jayampathi, 2010). Cronbach's alpha reliability coefficient normally ranges between 0 and 1 and 0.7 or higher is considered as acceptable (Pallant, 2005). However, rule of thumb about the Cronbach's suggested by George and Mallery (2003) is as follows: “_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor and _ < .5 – Unacceptable” (cited in Gliem and Gliem, 2003). After confirming the convergent validity (factor analysis) and test of reliability (Cronbach's alpha) of the items used to measure the constructs, this study conducts principle component analysis to make composite items to move for further analysis in the modeling part. However, before conducting multiple regression analysis to test the conceptual model a discriminant validity of constructs was evaluated through inter-correlations among sub constructs.

3.3.2 Descriptive analysis

The motive of this study is to understand the causal relationships among constructs. A number of researcher argued that some external variables (e.g. demographic variables such as age, gender, income etc.) directly influence the behavioral intention and behaviour through attitude, subjective norm, and perceived behavioral control (Fishbein and Ajzen, 1980, Ajzen, 1991). In fact, very few empirical researches combine these external variables in consideration within TPB model. In this present study, the socio-demographic factors were not included into causal model test but a brief descriptive statistics of the dependent variable is performed to understand the frequencies of dry fish consumption in Chittagong city. However, descriptive statistics were carried out using SPSS (Version 16.0) which is only focused on mean and standard derivation of dry fish consumption.

3.3.3 Principal component analysis

Principal component analysis is a variable reduction procedure or technique that results in a relatively small number of components that account for most of the variance in a set of observed variables. After confirming the validity and reliability of the items used to measure the constructs, principal component analysis was performed in this study. Through principal component analysis, composite items were constructed, which is used for multiple regression analysis to test the conceptual model. Principal component analysis is appropriate for the researcher when s/he has obtained measures on a number of observed variables and wishes to develop a smaller number of artificial variables. The principal components may then be used as predictor or criterion variables in subsequent analyses.

Principal component analysis is sometimes confused with exploratory factor analysis due to the nature (variable reduction procedure) of these two analyses. It is reality that the steps followed when conducting a principal component analysis are virtually identical to those followed when conducting an exploratory factor analysis. However, these two analyses are conceptually different. Factor analysis is used when the researcher believe that certain latent factors exist that exerts causal influence on the observed variables they are studying. Thus, the exploratory factor analysis helps the researcher identify the number and nature of these latent factors. However, in case of

principal component analysis the researcher does not make any assumption about an underlying causal model.

A principal component is defined as “a linear combination of optimally-weighted observed variables”. The following formula is the general form to compute scores on the first component extracted (created) in a principal component analysis:

$$C1 = b_{11}(X_1) + b_{12}(X_2) + \dots + b_{1p}(X_p)$$

Where,

$C1$ = the subject's score on principal component 1 (the first component extracted)

b_{1p} = the regression coefficient (or weight) for observed variable p , as used in creating principal component 1

X_p = the subject's score on observed variable p .

3.3.4 Multiple regression analysis

In this study, multiple regression analysis was used to draw the path diagram and to confirm the relationship of the constructs. Multiple regression analysis is a statistical technique that allows us to predict the variance in an interval dependent, based on linear combinations of interval, dichotomous, or dummy independent variables. Through multiple regressions it could be established that a set of independent variables explains a proportion of the variance in a dependent variable at a significant level (through a significance test of R^2), and can establish the relative predictive importance of the independent variables (by comparing beta weights). Using hierarchical regression, the researcher can see how most variance in the dependent can be explained by one or a set of new independent variables, over and above that explained by an earlier set. The multiple regression equation could be written as follows:

$$y = b_1x_1 + b_2x_2 + \dots + b_nx_n + c.$$

Where,

b 's = the regression coefficients, representing the amount the dependent variable y changes when the corresponding independent changes 1 unit.

c = the constant, where the regression line intercepts the y-axis; representing the amount the dependent y will be when all the independent variables are zero.

The standardized versions of the b coefficients are the beta weights, and the ratio of the beta coefficients is the ratio of the relative predictive power of the independent variables. The sign of the b coefficient indicates the direction of the relationship for the data values. If b is greater than or equal to zero, the relationship is positive or direct. If b is less than zero, the relationship is negative or inverse. Associated with multiple regressions is R^2 , multiple correlations, which is the percent of variance in the dependent variable, explained collectively by all of the independent variables.

4. Results

This part of the thesis presents the results of the data analysis. At the beginning, the study will perform a short descriptive analysis for the dependent variable to understand the dry fish consumption frequencies in Chittagong city. Descriptive analysis is achieved to explore mean and standard derivation of the measure. Thereafter, the results of the exploratory factor analysis and reliability test for the measures are presented. 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).

The last process is to test the conceptual model by multiple regression analysis through two steps. Principal component analysis is performed by the statistical software Minitab 16 to proceed on the data to composite items and thereafter, multiple regression analysis has been done to draw the path diagram and to test the relationship of the constructs.

4.1 Descriptive analysis

This section will present a brief descriptive analysis that was carried out to understand the dry fish consumption frequency among people in Chittagong city. In this case, socio demographic variables (gender, marital status, age etc.) were not taken into consideration. Results of the descriptive analysis are presented in followings.

4.1.1 Dry Fish consumption

Dry fish consumption behaviour is assessed by the self-reported frequency of past behaviour. The respondents were asked to report the number of times on average during the last year they consumed dry fish as meal. The results of nine alternatives of answers are presented in the table 4.1.

Table 4.1 Assessment of dry fish consumption frequency

Dry fish consumption frequency	Never	Max once a year	1-5 times every 6 months	Once a month	2-3 times a month	Once a week	2 times a week	3-4 times a week	Daily or almost every day	Mean (SD)
% (Percentage)										
	1	2	3	4	5	6	7	8	9	
	0.0	2.9	8.2	11.1	26.9	33.7	12.0	4.3	1.0	5.4(1.4)

The distribution of responses for “eating dry fish” centered in categories of 3-7. Across the nine-point scale, this indicates a normal path of the data. About 89% respondents reported that they eat fish at least once a month, and the respondents eating dry fish once a week (score of 6.0) are dominated, accounting for 33.7% of the sample. However, it is recorded that 26.9 % respondents consume dry fish 2-3 times a month and 11.1% respondents consume dry fish once a month. The results also showed that the number of respondents who never experience dry fish in their meal in Chittagong city is rare.

4.2 Exploratory factor analysis and test for reliability and validity

The exploratory factor analysis (EFA) and reliability test are performed firstly for the items within TPB model, then the extended TPB model with risk, knowledge, price and cost and thereafter, the attribute beliefs. The appropriateness of EFA is checked by Bartlett tests for presence of nonzero correlations and test of Measure of Sampling Adequacy (MSA) (Hair *et al.*, 1995). 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.

4.2.1 Construct within the TPB model

An exploratory factor analysis for constructs within TPB model involves 17 items, in which 5 items are regarded to attitudes, 5 items for norms, 3 items for control and 4

items for intention. Before conducting the factor analysis, Bartlett tests for presence of nonzero correlations and test of Measure of Sampling Adequacy (MSA) were practiced to check the appropriateness of the data (Hair *et al.*, 1995). The MSA index was 0.80 and the Bartlett test of sphericity was significant at 0.001, indicated an overall suitability of data for exploratory factor analysis to perform. Principle component analysis for these items yielded four factors that explain 78.15% of cumulative variance of the data. From the factor loadings of items, it was observed that 1 item from attitude “When I eat dry fish, I feel unsatisfied / satisfied”, 2 items from norms “My culture/religion wants me to eat dry fish” and “My friends/relatives think that I should eat dry fish”, 1 item from intention “I plan to eat dry fish” had higher cross factor loading (see Appendix 1). Thus, 4 items were excluded due to cross loading on the other factors. However, 13 items belongs to four factors were selected for further analysis (see table 4.2). The factor loadings of items, explained variance and Cronbach’s alpha of the constructs are presented in table 4.2.

The results in table 4.2 shows that factor loadings of items are all greater than the standard level of 0.7. After exclusion of some items, the Cronbach’s alpha of attitudes and norms were slightly decreased but the Cronbach’s alpha of intention was improved at .96. However, the Cronbach’s alpha of all the factors 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 but high convergent validity of the items within the construct. 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 81.76% of the variance in the data. The value of the KMO statistics is also higher ($0.79 > 0.5$), thus it implies the appropriateness of the factor analysis (Malhotra, 2006).

Table 4.2 Factor loading, Cronbach's Alpha, and explained variance of the constructs within TPB model

Items	Attitude	Norms	Intention	PBC
When I eat dry fish, I feel bad / good	.88			
When I eat dry fish, I feel unpleasant / pleasant	.76			
When I eat dry fish, I feel dull / exiting	.77			
When I eat dry fish, I feel negative / positive	.86			
My family expects me to eat dry fish		.85		
My family wants me to eat dry fish		.89		
My friends/relatives want me to eat dry fish		.79		
I expect to eat dry fish		.32	.89	
I want to eat dry fish			.90	
I desire to eat dry fish			.94	
How much personal control do you feel over eating dry fish?				.82
For me to eat dry fish is				.91
If I want, I can easily eat dry fish tomorrow				.92
Cronbach's alpha	.88	.88	.96	.86
Explained variance (%)	22.95	21.62	18.89	18.30
Cumulative explained variance (%)	22.95	44.57	63.46	81.76
MSA=0.79; Bartlett test < 0.001				
<i>Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.</i>				

4.2.2 Other constructs within the extended-TPB model

Beside the TPB model there are three other constructs within the extended model such as perceived risk, knowledge, price and cost. An exploratory factor analysis was done for 20 items regarding other constructs within the extended model. The MSA index was 0.76 and the Bartlett test of sphericity was significant at 0.001, indicated an overall suitability of data to perform exploratory factor analysis. Principle component

analysis for these items yielded four factors which explain 70.56% of cumulative variance of the data (see Appendix 2). Factor loading, Cronbach's Alpha, and explained variance of risk, knowledge, price and cost is presented in table 4.3.

Table 4.3 Factor loading, Cronbach's Alpha, and explained variance of risk, knowledge, price and cost.

Items	Perceived Risk	Product and nutritional knowledge	Procedural knowledge	Price and cost
Purchasing dry fish....feel psychologically uncomfortable	.89			
I would become concerned..... long-term risks	.91			
Purchasing dry fish is unfashionable.... lower status	.79			
I know what kind of dry fish is safe and unsafe to eat		.81		
I know what kind of dry fish is healthy and unhealthy		.84		
I have good knowledge.....nutrition dry fish contains		.60		
I know what kind of dry fish is rich in nutrition		.75		
I find it easy to prepare delicious and tasty meals			.86	
My friends consider me as an expert on dry fish			.83	
I have a lot of knowledge how to evaluate the quality			.82	
I know a lot about the risk for eating dry fish			.90	
My friends consider me.....expert on the risky aspect			.81	
I have a lot of knowledge... if dry fish is risky to eat			.85	
Dry fish is not expensive - expensive				.90
Eating dry fish is good value for money				.89
I choose to eat dry fish because it is economical				.89
Eating dry fish is suitable for my budget				.86
Cronbach's alpha	.84	.75	.91	.91
Explained variance (%)	25.76	18.60	14.23	14.04
Cumulative explained variance (%)	25.76	44.35	58.58	72.62
MSA = .71; Bartlett test < 0.001				
<i>Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.</i>				

Perceived risk involves six items. However, first three items “I am concerned that it will not be as I expected”, “If I were to purchase...worry about losing/wasting money” and “I would worry....product not tasting as good as it should” had higher cross factor loading (see Appendix 2). Thus, these three items were excluded for further analysis. After the exclusion of 3 items from risk, factor loadings of all the items are greater than the standard level (0.7). This higher factor loading indicate that the measures describe the same factor. The Cronbach's Alpha is significant high at .84, which indicates the reliability of the constructs. The value of the KMO statistics is decreased from .76 to .71 after the exclusion of 3 items but still higher than the suggested level 0.5 (Malhotra, 2006) (see table 4.3). Therefore, it could be said that the factor analysis for this construct is appropriate.

Knowledge construct was initiated with 10 items. Two factors were extracted from knowledge items, named as product and nutritional knowledge and procedural knowledge. There were 4 items for the product and nutritional knowledge and 6 items for the procedural knowledge. All the items associated with product and nutritional knowledge have factor loading well above the recommended level of 0.7; only exception was “I have good knowledge about what kind of nutrition dry fish contains” (.60). However, still this loading is high as Hair *et al.* (1998) indicate factor loadings above 0.6 "high" (see Appendix 2). After the exclusion of 3 items belongs to the risk construct, factor loading of other items belongs to products and nutritional knowledge and procedural knowledge is slightly changed but it does not affect on Cronbach's alpha. The Cronbach's Alpha for product and nutritional knowledge is higher (.75) than the critical level of 0.7 (see table 4.3). Thus, it could be said that items used in this study are suitable to describe the product and nutritional knowledge factor.

In case of procedural knowledge, the factor loadings of items are all greater than 0.8. The Cronbach's Alpha is higher (.91); which implies the high inter-correlations among the items (see table 4.3). Here, instead of using single knowledge construct, as per our theory, this study will use two sub-constructs as product knowledge and procedural knowledge. These two types' sub-constructs are also made through principal component analysis and used for multiple regression analysis.

Four items were involved with price and cost. Factor loadings of all the items are greater than 0.8 (see Appendix 2). Due to the exclusion of some items from the risk

constructs, the factor loading of items belongs to price and cost is changed a little bit but still higher than the standard level of 0.7 (see table 4.3). This higher factor loading indicate that the measures describe the same factor and the Cronbach's Alpha is significant high at .91 that indicates the reliability of the constructs. The value of the KMO statistics is still higher (.71), thus it implies the appropriateness of the factor analysis (Malhotra, 2006).

4.2.3 Correlations and discriminant validity of the extended TPB- model

The correlations among the measures used in the study are listed in Table 4.4. The measures of constructs were examined to establish discriminant validity. In this study, value for the discriminant validity of the constructs is calculated by the formula proposed by Campbell and Fiske (1959). Although there is no standard value for discriminant validity, Campbell and Fiske (1959) suggested that, a result less than .85 tells us that discriminant validity likely exists between the two constructs. A result greater than .85, however, tells us that the two constructs overlap greatly and they are likely measuring the same thing. The results of the study show that all the value for the discriminant validity is less than .85. Therefore, it is confirmed that discriminant validity exists between all corresponding pairs of constructs within the extended TPB-model.

Table 4.4 Mean, Standard deviation and inter-correlation of the constructs within the extended TPB- model

	Mean	S. D	1	2	3	4	5	6	7	8
1. Behaviour	5.38	1.39	-							
2. Intention	4.79	1.96	.59***	-						
3. Attitude	4.90	1.22	.56***	.50***	-					
4. Norms	4.30	1.74	.57***	.53***	.45***	-				
5. PBC	5.21	1.49	-.08 ^{ns}	-.04 ^{ns}	.03 ^{ns}	-.11 ^{ns}	-			
6. Risk	4.18	1.26	.10 ^{ns}	-.18*	-.13 ^{ns}	.20**	-.10 ^{ns}	-		
7. Know_product	5.39	.99	.16*	.20**	.07 ^{ns}	.18**	.01 ^{ns}	-.15*	-	
8. Know_procedural	4.94	1.16	.33***	.52***	.32***	.34***	.01 ^{ns}	.13 ^{ns}	.09 ^{ns}	-
9. Price	5.31	1.09	.03 ^{ns}	.06 ^{ns}	-.01 ^{ns}	.08 ^{ns}	-.05 ^{ns}	.02 ^{ns}	-.02 ^{ns}	.00 ^{ns}

Notes: ***Correlation is significant at $p < 0.001$ (2-tailed); **Correlation is significant at $p < 0.01$ (2-tailed); *Correlation is significant at $p < 0.05$ (2-tailed); ns: non-significant.

4.2.4. Attribute beliefs

In this study, 14 items related to dry fish attribute beliefs were used, of which six factors were extracted. All the constructs are extracted as per the expectation; however, the only exception was value construct. In this study, value has been described within an additional constructs named Price and cost. Table 4.5 presents factor loading of items, explained variance and Cronbach's alpha for 6 latent constructs. Six factors explored are:

(1) *Perceived quality* (factor 1) this factor involved three items related to taste, texture and appearance. The factor loading for all items are higher than the standard 0.7 level and the Cronbach's Alpha is also higher (0.85) then the critical level of 0.7. Thus, the validity of items for describing the construct is justified.

Table 4.5 Factor loading, Cronbach's Alpha, and explained variance of the attribute beliefs

Items	Quality	Healthiness	Negative affect	Convenience	Availability	Suitability
Bad - good taste	.88					
Bad - good texture	.75					
Bad - good appearance	.80					
Unhealthy - healthy		.90				
Not nutritious - nutritious		.85				
Dry fish has an unpleasant smell			.86			
It is difficult to remove all bone out of dry fish			.77			
The bones in dry fish are unpleasant			.74			
Difficult - Easy to store				.89		
Not Convenience - Convenience				.88		
Unavailable - available					.86	
Difficult - easy to buy					.93	
Not suitable - suitable to cooking delicious meals						.92
Not suitable - suitable to prepare many dishes						.90
Cronbach's alpha	.85	.79	.70	.80	.79	.91
Explained variance (%)	16.94	13.67	13.38	12.46	12.44	12.11
Cumulative explained variance (%)	16.94	30.60	43.98	56.44	68.89	80.99
MSA = .69; Bartlett test < 0.001						
<i>Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.</i>						

(2) *Healthiness* (factor 2) included two items. The factor loadings of the items are higher than 0.8 and the Cronbach's Alpha is also higher (0.79) than the critical level of 0.7. Thus, the validity of items for describing the healthiness construct is justified.

(3) *Negative affect* (factor 3) of eating dry fish was involved with three items, of which one item for unpleasant smell and 2 items are related with unpleasant bones. All the items have higher factor loading than the standard 0.7 level. The Cronbach's alpha (0.70) is very close to the suggested level. Thus, it could be said that these items related to bones and smell are suitable to describe the negative effects.

(4) *Convenience* (factor 4) involves two items related to storage capability and use of dry fish at home. Both the items have higher factor loading (.89 and .88 respectively) and the Cronbach's alpha (0.80) is well above the suggested level. Thus, it could be explained that these items related to storage ability of dry fish are suitable to describe convenience.

(5) *Availability* (factor 5) involves two items related to the availability of dry fish in the market. Both the items have higher factor loading (0.86 and .93 respectively) and the Cronbach's alpha (0.79) is well above the suggested level. Thus, it could be considered that these items related to the availability of dry fish are suitable to describe the construct.

(6) *Suitability or suitable to dishes* (factor 6) includes two items regarded to evaluation of fish suitability of fish for cooking and preparing many dishes as well as delicious dishes. Both the items have higher factor loading (0.92 and .90 respectively) and the Cronbach's alpha (0.91) is well above the suggested level. Thus, it could be said that these items related to the availability of dry fish are suitable to describe the construct.

4.2.5 Correlations and discriminant validity of the belief attributes

The correlations among the measures of attribute beliefs used in the study are listed in Table 4.6. The measures of constructs were examined to establish discriminant validity. The results of the study show that all the value for the discriminant validity of attribute belief constructs are less than .85. Therefore, it could be conclude that discriminant validity exists between all corresponding pairs of belief constructs.

Table 4.6 Mean, standard deviation and inter-correlation of the constructs within the belief attributes

	Mean	S. D	1	2	3	4	5
1. Quality	5.01	1.35	-				
2. Healthiness	5.60	1.09	.39***	-			
3. Negative affect	5.02	1.22	-.07 ^{ns}	-.08 ^{ns}	-		
4. Convenience	4.42	1.54	.28***	.11 ^{ns}	.14*	-	
5. Availability	5.40	1.12	.25***	.09 ^{ns}	.06 ^{ns}	.27***	-
6. Suitability	3.86	1.61	.50***	.22**	.09 ^{ns}	.20**	.02 ^{ns}

Notes: ***Correlation is significant at $p < 0.001$ (2-tailed); **Correlation is significant at $p < 0.01$ (2-tailed); *Correlation is significant at $p < 0.05$ (2-tailed); ns: non-significant

4.3 Test of the conceptual models

As per the expectations of the research, statistical analysis was undertaken to test the conceptual models. First of all principle component analysis was conducted by using Minitab (version 16) software to combine the variables into a composite variable and to make the data ready for regression analysis. After that hierarchical multiple-regression was used by using SPSS version 16.0 (SPSS Inc.). Five models were tested as described below:

4.3.1 Testing the Theory of Planned Behaviour

In order to draw the results two multiple linear regression analyses were performed. Firstly, intention to eat fish was regressed onto attitude, subjective norm and perceived behavioral control; secondly, consumption of fish was regressed onto intention, attitude, subjective norm and perceived behavioral control. Model summary and determinants of both regressions are presented in Table 4.7.

Table 4.7 Model summary (TPB) and determinants of intention and behaviour (Correlation coefficient, t-value, and significance)

	Beta	t-value	Sig.	Model Summaries
Intention regressed				
<i>Attitude</i>	.33	5.32	.000	R ² = .37, adjusted R ² = .36, F = 39.99, Sig. of F = .000 Durbin-Watson = 1.73 Predictor: (Constant), Attitude, Norms
<i>Norms</i>	.38	6.08	.000	
<i>PBC</i>	-.01	-.10	.924	
Behaviour regressed				
<i>Intention</i>	.29	4.63	.000	R ² = .49, adjusted R ² = .48, F = 49.0, Sig. of F = .000 Durbin-Watson = 1.96 Predictor: (Constant), Intention, Attitude, Norms
<i>Attitude</i>	.29	4.76	.000	
<i>Norms</i>	.28	4.52	.000	
<i>PBC</i>	-.05	-.93	.355	

This output shows intention, attitude, norms, and PBC all together explain 48% of the variance in dry fish consumption behaviour for this sample. The R² (49%) is higher than the Adjusted R² (48%). The probability of the F statistic (49.0) for the overall regression relationship for all independent variable is <0.001, less than or equal to the level of significance of 0.05. This finding supports the research estimation that there is a statistically significant relationship between the independent variables (intention, attitude and norms) and the dependent variable. In the present study, perceived behavioral control is failed to establish significant relationship with intention and behaviour.

The Standardized Beta Coefficients give a measure of the contribution of each variable to the model. A large value indicates that a unit change in this predictor variable has a large effect on the criterion variable. In this model intention, attitude and norms are seen to have a large effect on behaviour. For the independent variable control the probability of the t statistic is -.93, which is greater than the level of significance of 0.05. Thus, it could be argued that the slope associated with control are equal to zero (b = 0) and not confirmed any significant relationship between perceived behavioural control and fish consumption frequency. However, the t

statistic confirmed that intention, attitude and norms are the better predictor of dry fish consumption behaviour in Chittagong city.

4.3.2 The role of risk, knowledge and price within the extended TPB-model

A four-step multiple regression analysis was undertaken to examine the role of risk, product and nutritional knowledge and price within the extended TPB model. The first step involved using measures from the TPB with the second step adding in perceived risk, the third and fourth step included knowledge (product and nutritional knowledge and procedural knowledge), price and cost respectively. All steps used intention as the dependent variable, with step one using attitude, subjective norm and PBC as a predictor of intention. The second step added in perceived risk, while the third step added product and nutritional knowledge and procedural knowledge and finally the fourth step added in price and cost. Model summary is presented in Table 4.8.

As seen from the Table 4.8; attitude, norms, and procedural knowledge are the best predictor of intention for this sample. This output shows that the independent variables all together explain 52% of the variance in dry fish consumption intention for this sample. The R^2 (54%) is higher than the Adjusted R^2 (52%). The value of the Durbin-Watson statistic ranges from 0 to 4. As a general rule of thumb, the residuals are not correlated if the Durbin-Watson statistic is approximately 2, and an acceptable range is 1.50 - 2.50. The Durbin-Watson statistic for this research is 1.81, which falls within the acceptable range. The probability of the F statistic (33.31) for the overall regression relationship for all independent variable is <0.001 , less than or equal to the level of significance of 0.05. The high t-value of attitude, norms, and procedural knowledge suggested that they have greater effect on intention in comparison to PBC, risk, product and nutritional knowledge, price and cost.

Table 4.8 Model summaries (extended –TPB model), Correlation co efficient, t-value, and significance

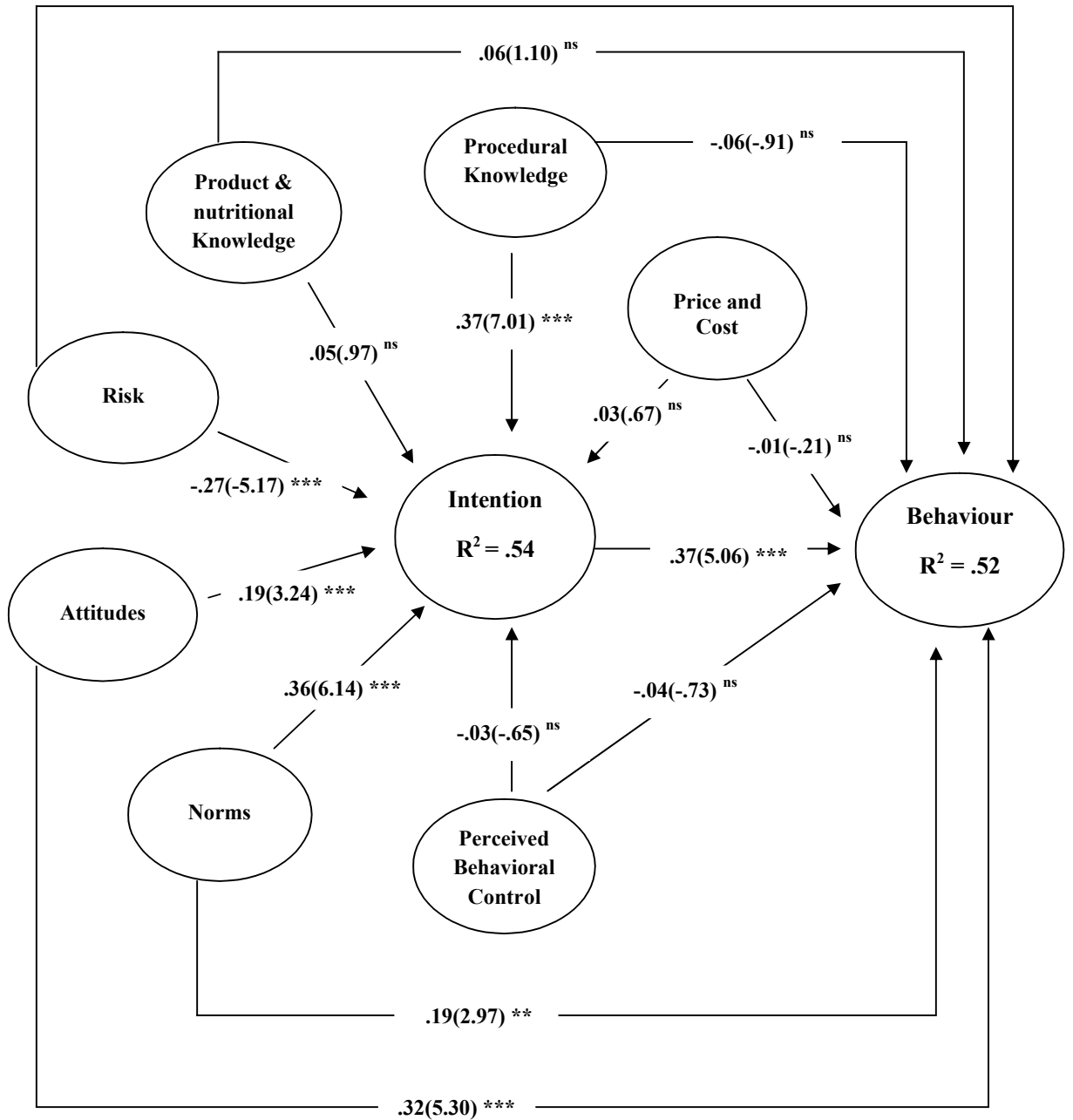
	Beta	t-value	Sig.	Model Summaries
Intention regressed				
<i>Attitude</i>	.19	3.24	.001	R ² = .54, adjusted R ² = .52, F= 33.31, Sig. of F = .000 Durbin-Watson = 1.81 Predictor: (Constant), Attitude, Norms
<i>Norms</i>	.36	6.14	.000	
<i>PBC</i>	-.03	-.65	.515	
<i>Risk</i>	-.27	-5.17	.000	
<i>Product and nutritional knowledge</i>	.05	.97	.333	
<i>Procedural knowledge</i>	.37	7.01	.000	
<i>Price and cost</i>	.03	.67	.503	
Behaviour regressed				
<i>Intention</i>	.37	5.06	.000	R ² = .52, adjusted R ² = .50 , F= 26.51, Sig. of F = .000 Durbin-Watson = 1.91 Predictor: (Constant), Intention, Attitude, Norms, Risk
<i>Attitude</i>	.32	5.30	.000	
<i>Norms</i>	.19	2.97	.003	
<i>PBC</i>	-.04	-.73	.464	
<i>Risk</i>	.18	3.12	.002	
<i>Product and nutritional knowledge</i>	.06	1.10	.273	
<i>Procedural knowledge</i>	-.06	-.91	.365	
<i>Price and cost</i>	-.01	-.21	.831	

Perceived behavioral control and risk has negative relationship with intention. The t-value and significance implies that PBC, product and nutritional knowledge, price and cost fails to establish statistically significant relationship with intention. In case of risk, the beta value shows risk has negative beta co-efficient, which implies that 1 unit positive standard deviation change in risk is expected to result in a negative beta coefficient change in intention; also the t-value significant at the 95% level of significance for this independent variable.

In order to find out the role of behaviour in the extended model, a five-step regression analysis was again performed. Now self reported dry fish consumption frequency is considered as the dependent variable and attitude, norms, PBC, risk, product and nutritional knowledge, procedural knowledge, price and cost are considered as the

predictor of behaviour. The first two steps of the regression involved using measures from the TPB with the third step adding in risk; fourth step included product and nutritional knowledge and procedural knowledge and the fifth steps added price and cost. Results of the extended model are annexed in the appendix 3 and 4. The summaries result of the model is depicted in Table 4.8.

The result from the Table 4.8 is shown that regressed with behaviour reduces the R Square at 52%. It also shows that in the model intention, attitude, norms and risk are the best predictor of the dry fish consumption behaviour. The Durbin-Watson statistic for this model is 1.91, which falls within the acceptable range. The probability of the F statistic (26.51) for the overall regression relationship for all independent variable is <0.001 , less than or equal to the level of significance of 0.05. However, PBC, procedural knowledge, price and cost have negative relationship with behaviour. The t-value and significance implies that PBC, procedural knowledge, price and cost fails to establish statistically significant relationship with behaviour. The following path diagram in Figure 4.1 will display the role of behaviour in the extended TPB model.



Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; ns: non-significant

Figure 4.1 Regressions and inter correlations of the extended model

4.3.3 Explaining attitude

In this study, four items were used to assess the attitude construct. 8 items were used to measure the salient beliefs reasonable in forming attitude (of which 3 items for perceived quality and 2 items for healthiness) and another 3 items (negative affect for

unpleasant smell and bones) were also used which contributes only negatively in forming food attitude. In order to conduct the multiple regression analysis a composite value for attitude, quality, healthiness and negative affect were made through principle component analysis in this study. Then the attitude taken as the dependent variable and the quality, healthiness and negative affect are taken as the independent variable and the multiple regression models was run. The model summary is as below:

Table 4.9 Model summaries (attitude), Correlation co-efficient, t-value, and significance

	Beta	t-value	Sig.	Model Summaries
Attitude regressed				
<i>Quality</i>	.46	6.64	.000	R ² = .18, adjusted R ² = .17, F= 15.20, Sig. of F = .000 Durbin-Watson = 2.41 Predictor: (Constant), Quality
<i>Healthiness</i>	-.13	-1.93	.055	
<i>Negative affect</i>	.085	1.33	.185	

As seen from the above table quality, healthiness and negative affect all together explain only 17% of the variance in dry fish consumption attitude for this sample. The R² (18%) is higher than the Adjusted R² (17%).

The probability of the F statistic (15.20) for the overall regression relationship for all independent variable is <0.001, less than or equal to the level of significance of 0.05. Thus, it could be said that there is statistically significant relationship of the independent and the dependent variables.

It is being observed from the t statistic that only attribute qualities have statistically significant relationship with dry fish consumption attitude. For the independent variable healthiness and negative effects the probability of the t statistic is -1.93, and 1.33 respectively for the b coefficient is <0.001, which is greater than the level of significance of 0.05. Thus, the slope associated with healthiness and negative affects is equal to zero (b = 0), which confirm that healthiness and negative affect do not affect significantly in forming dry fish consumption attitude. However, I could be conclude that even though quality, healthiness and negative affect all have construct

validity, only perceived quality form the attitude in the context of dry fish consumption.

4.3.4 Explaining perceived behavioral control (PBC)

In this study, 3 items were used to assess the perceived behavioral control. 6 items were used to measure the control beliefs of which 2 items for convenience, 2 items for availability and 2 items for suitability. In order to conduct the multiple regression analysis a composite value for convenience, availability and suitability were made through principle component analysis. Then the PBC taken as the dependent variable and the convenience, availability and suitability are taken as the independent variable and the multiple regression models was run. The model summary is presented in Table 4.10.

Table 4.10 Model summaries (control beliefs), Correlation co-efficient, t-value, and significance

	Beta	t-value	Sig.	Model Summaries
PBC regressed				
<i>Convenience</i>	-.02	-.24	.810	R ² = .00, adjusted R ² = -.01, F= .03, Sig. of F = .992 Durbin-Watson = 2.03
<i>Availability</i>	.00	-.01	.995	
<i>Suitability</i>	.12	.23	.819	

The model summary table shows that the R square is negative (-1%) and the adjusted R square is zero. The summary of the model is indicated that none of the predictor has the statistically significant relationship with the dependent variable (PBC). Beta coefficient and the t statistics of the model also say that none of the factors has the statistically significant relationship with the PBC. In conclusion, it could be said that even though PBC provide construct validity in this study, it is a problematic construct in the context of dry fish consumption, because PBC is not significantly correlated with the other constructs within the TPB model and the extensions. However, it is found that control beliefs such as convenience, availability and suitability, are not significant indicators of PBC and any influence of PBC on intention and behaviour is not found in this study.

5. Discussion and conclusion

The first main objective of this study was to explore the consumers' attitude, intention and consumption of dry fish in Chittagong city and the second objective was to extend the traditional TPB-model with some additional variables; to understand the role of perceived risk, knowledge, price and cost in this area. To accomplish these two objectives this study applies TPB (Ajzen, 1991) as a conceptual framework. Thus, the main extended model involves constructs from the TPB model and an inclusion of perceived risk, knowledge (product and nutritional knowledge and procedural knowledge), price and cost. The items designed to measure the constructs were either adopted or taken from previous researches. A convenience sample (n = 208) was collected through direct interviews of households in Chittagong city, the port city of Bangladesh. The analysis methods employed were exploratory factor analysis, a brief descriptive analysis, principle component analysis and the multiple regression analysis. The following sections of this thesis discuss the findings regarding the research issue and questions. Conclusion and some suggestions for future researches will end the thesis.

5.1 Factor analysis, reliability and validity of the constructs

Factor loadings of all the items used to measure the constructs within the TPB model are greater than 0.8 and above the standard level of 0.7 (Hair *et al.*, 1998). The cumulative explained variance of the TPB model is 81.8%. The higher factor loadings and Cronbach's alphas ensure convergent reliability and validity of the constructs within the TPB model. In the extended model, all the items of risk have higher factor loading greater than the standard level of 0.7. Except the item "I have good knowledge.....nutrition dry fish contains" all the items associated with product and nutritional knowledge and procedural knowledge have factor loading well above the recommended level of 0.7. Four items has been used to measure the construct price and cost which have higher factor loading greater than 0.8. The Cronbach's Alpha for risk, product and nutritional knowledge, procedural knowledge, price and cost is between .75 and .91, which are greater than the critical level of 0.7. Thus, Cronbach's Alpha is ensured the reliability of the items used to measure these constructs (Hair *et al.*, 1998, Malhotra, 2006).

In the attribute belief model, six factors were identified as perceived quality, healthiness, negative affect, convenience, availability and suitability. Cronbach's Alpha for these factors is between 0.70 and 0.91; which are clearly above the satisfactory level (Hair *et al.*, 1998). Thus, convergent validity of the constructs is ensured.

5.2 Behaviour and intention towards eating dry fish

Dry fish is one of the important sources of animal protein in Bangladeshi diet. The result of the study also supports that people consume dry fish at a satisfactory level of frequency. About 51% of respondents reported that they consume dry fish at least once a week. The study did not consider any socio-demographic variables to contrast the consumption frequency. The consumption seems slightly higher because of the nature of the sample; the sample is not a country representative. People from southern part of Bangladesh are more likely consume dry fish than the people of north. Chittagong city is adjacent to the Bay of Bengal, where dry fish is very common food item for most of the household.

Intention within TPB is defined as motivation toward the behaviour (e.g. fish consumption). The three items used to measure the construct of intention appeared as a good internal convergence (Cronbach's alpha is 0.96) and high factor loadings show that the items are suitable to describe the constructs. Results of this study confirmed that intention is a significant predictor of behaviour as proposed by TPB. The correlation between intention and behaviour is significantly high ($\beta = .37$, $t = 5.06$ at significant level $p < 0.001$), which is very close to other studies in the field of social science and seafood (Ajzen and Fishbein, 2005; Ahamed, 2009; Olsen, 2001; Verbeke and Vackier, 2005).

5.3 The role of attitudes towards dry fish consumption

Four integrated items designed to assess global attitude toward dry fish consumption appeared to be reliable to represent the construct (Cronbach's alpha = 0.88). A number of studies confirmed that attitude was the strongest predictor of intention in the social as well as the food context (Ajzen, 1991; Conner and Armitage, 1998; Fishbein and Ajzen, 2005; Honkanen *et. al*, 2006; Olsen, 2001, 2004; Shepherd and Raats, 1996; Saba and Vassallo, 2002; Verbeke and Vackier, 2005). Parallel to other

studies in the domain of social science and food consumption behaviour, the present study also confirmed that attitude is the strongest predictor of intention. This study supports that the impact of attitude was highly significant on behaviour ($\beta = .32$, $t = 5.30$ at significant level $p < .001$) and also on behavioral intention ($\beta = .19$, $t = 3.24$ at significant level $p < .001$).

In the paradigm of TPB, it is proposed that behavioral beliefs are the main determinants of attitude. Attitude can be determined by number of salient beliefs related to the behaviour in question (Ajzen, 1991; Fishbein and Ajzen, 1975). As proposed by Olsen (2004), perceived quality is the most important attribute to determine satisfaction and evaluation in seafood context. However, perceived quality is assessed by taste, appearance, and texture of food products. Quality, healthiness and negative affect all together explain 17% of variance in dry fish consumption attitude. This study found that perceived quality is the best predictor of attitude, which has significant relationship ($\beta = .46$, $t = 6.64$ at significant level $p < .001$) with attitude. A number of food studies also suggested that bones and smell are unique attributes having negative effect on the attitudes (Olsen 2001; 2004; Verbeke and Vackier, 2005). In this study, it is also observed that negative effect of bone and smell does not have any significant relationship with attitude. Although the bones in the fish are considered unpleasant in seafood studies (Olsen, 2004). In general, people don't think bone and smell of dry fish are unpleasant due to having different culture and cooking procedure. In Bangladesh, people like more spicy food and they use some easier techniques to separate bones from dry fish. In case of smell attribute, smell of dry fish is favourite to maximum respondents. Most of the respondents were positively answered and reported that smell of dry fish attracts them to take meals and enhance their appetite.

5.4 Influence of social norms

The three items used to measure social norms and family expectation on eating dry fish had very high factor loadings and appeared to be highly internally consistent (Cronbach's alpha = 0.88). Although, a number of studies argued that social norms are the weakest predictor of intention and behaviour (Ajzen, 1991; Armitage and Conner, 2001; Fishbein and Ajzen, 1975; Tuu *et al.*, 2008) in TPB framework, some other studies confirmed that social pressure is a significant and strong indicator of

intention (Berg *et al.*, 1999; Olsen, 2001; Shepherd, 1989). However, the present study is suggested that that social pressure is a significant and strong indicator of intention ($\beta = .36$, $t = 6.14$ at significant level $p < .001$) and dry fish behaviour ($\beta = .19$, $t = 2.97$ at significant level $p < .01$).

Like other Asian countries, in Bangladesh, people prefer to eat together and most of the household is large in size. Almost half of the respondents are from large family where the number of family member is above six. Olsen (2001) reported that while family members eating together, parent somehow forced or influence other family members to eat the served food items. Eating dry fish is a cultural part of Bangladeshi people. However, in this study the cultural influence seems to have lower influence. Religious factors are suggested as minor motives in Norway (Honkanen *et. al.*, 2006), but in Bangladesh it could have a greater influence because Muslim community does not eat some fish species. In future, research emphasis should be taken to tap the religious effect on consumption of dry fish.

5.5 Perceived control and barriers toward dry fish consumption

Perceived behavioral control (PBC) was assessed in this study by asking the respondents to rate their-self perception of eases/difficulties in executing dry fish consumption. The perceived behavioral control has been criticized as overly simplistic (Terry, 1995) and several studies have found weak internal reliability of items designed to measure the construct (Beale and Manstead, 1991). However, the three items in this study had high factor loadings and appeared highly internal reliability (Cronbach's alpha = 0.86).

In this study, no significant correlation was found with perceived behavioral control and both intention ($\beta = -.03$, $t = -.65$ at significant level $p > .05$) and behaviour ($\beta = -.04$, $t = -.73$ at significant level $p > .05$). This finding is consistent with previous research in the field of food consumption (Ahmed, 2009; Armitage, and Conner, 1999; Mahon *et al.*, 2006). Mahon *et al.* (2006) argued that if the consumers have high level of self-confidence in evaluating a product purchasing decision then the perceived behavioral control would not be a major issue in influencing the intention.

According to TPB, the perceived behavioral control is determined by control beliefs (Ajzen, 1991). Olsen (2004) found that the most important control factors that

influence consumers' seafood purchasing include price/cost, convenience/availability and knowledge. In this study, it is found that attributes such as convenience, availability and suitability are not significant indicators of perceived control. The reason is that, although dry fish cannot produce in rainy season, it can be kept longer period. Therefore, it is available in every grocery shops in Bangladesh throughout the year. While it takes 1 kilogram fish or meat to cook a curry for a small household, at that time 100/200 gram dry fish is enough to cook a curry for the same household. However, it could be an important issue for future research.

5.6 Influence/ role of perceived risk

Risk is being conceptualized differently in different studies according to the context of the study. In consumer behaviour research, risk is associated to a distinct product or product category (Tuu and Olsen, 2009). This study defines and measures the direct impact of risk perception by six different aspects on the intention and consumption of dry fish. In consistent with previous studies, six facets of perceived risk related to dry fish consumption was assumed (Ahamed, 2009; Angulo and Gil, 2007; Klerck and Sweeney, 2007; McCarthy and Henson, 2005; Tsiros and Heilman, 2005; Yuksel and Yuksel, 2007). In the exploratory factor analysis, it was observed that first 3 items about functional, financial and performance risk had higher cross factor loadings (see appendix 2). It means that they are belongs to other factors. Therefore, another 3 items explaining psychological, physical and social risk were taken into consideration to understand the effect of perceived risk on intention and dry fish consumption behaviour.

In the extended model it was observed that perceived risk construct has a negative relationship with intention ($\beta = -.27$, $t = -5.17$ at significant level $p < .001$). The beta value shows risk has negative beta coefficient, which implies that 1 unit positive standard deviation change in risk is expected to result in a negative beta coefficient change in intention. However, while regressed behaviour, statistically significant relationship was obtained between perceived risk and behaviour ($\beta = .18$, $t = 3.12$ at significant level $p < .01$). This result is indicating that risk have 18% contribution to influence dry fish consumption behaviour.

5.7 Knowledge of the consumers

Olsen (2004) found that consumer knowledge about food is an internal resource that can be linked to the quality of the product and the preparing procedure of food. In this study, knowledge is defined from the both point of view as the product and nutritional knowledge and the procedural knowledge of the consumer. The result shows that product and nutritional knowledge do not have statistically relationship with intention ($\beta = .05$, $t = .97$ at significant level $p > .05$) and behaviour ($\beta = .06$, $t = 1.10$ at significant level $p > .05$). Ahamed (2009) did not find any significant relationship between product knowledge and intention of consuming fish, but he found significant relationship between product knowledge and behaviour ($\beta = .16$, $t = 2.52$ at significant level $p < .05$).

To compare with fish and seafood, the cooking procedure of dry fish is rather difficult than fish and seafood. The consumers, who do not have enough procedural knowledge, are not willing to buy dry fish. The extended model shows that procedural knowledge fails to establish significant relationship with dry fish consumption behaviour ($\beta = -.06$, $t = -.91$ at significant level $p > .05$), but have significant impact on intention ($\beta = .37$, $t = 7.01$ at significant level $p < .01$). The result is similar with Ahamed (2009), in case of fish consumption behaviour at Dhaka city in Bangladesh.

In the marketing literatures, two different types of knowledge such as subjective and objective knowledge were discussed (Klerck and Sweeney 2007, Chiou 1998), which are not addressed in this study. In future research this classification should be taken into consideration because when the consumers have high subjective product knowledge the effect of PBC on intention is assumed to be weaker (Chiou, 1998), while the objective knowledge is closely associated with the consumer's risk perception (Klerck and Sweeney 2007). However, larger sample size and interactive variable analysis might reveal some significant result.

5.8 Role of price and cost

A number of food studies suggest that price and cost has a great influence on behavioral intention (Brunsø, 2003; Olsen, 2004; Pertovici *et al.*, 2004; Verbeke and Vackier, 2005) and consumption (Olsen, 2004; Verbeke and Vackier, 2004). Dry fish is a low-cost dietary protein source in Bangladesh. Therefore, it is assumed that price

and cost might affect on intention and consumption of dry fish in Bangladesh. But the result shows that price and cost do not have any statistically significant relationship with intention ($\beta = .03$, $t = .67$ at significant level $p > .05$) and behaviour ($\beta = -.01$, $t = -.21$ at significant level $p > .05$).

The reason is that this study is just focused on the consumers of Chittagong city where the average income and purchasing power of the consumers are comparatively higher than the consumer is live outside of the city. Another reason for such failure might be the smaller sample size ($n= 208$) of this study.

5.9 Managerial and theoretical implications

The study has shown that the consumers in the Chittagong city consume dry fish at a satisfactory level of frequency. The average score supports that more than half of the respondents (51%) consume dry fish once a week. Their general attitude towards dry fish consumption and the motivation to eat dry fish are also significantly positive.

With increasing the education level in Bangladesh, people are more concern about healthy eating and risky aspect. Most of the people knew that some dry fish industries use health hazardous chemicals for long time preservation of dry fish. It was found that people are more concerned about potential long-term risk to their family and others. These findings suggest that there is an immense potentiality of safe and hazard free dry fish business.

This study found that procedural knowledge has significant relationship with behavioral intention of consuming dry fish. This is a very good indication for the dry fish industry to expand their business by enhancing consumer's procedural knowledge.

Price and cost is one of the most important influential factors of fish and seafood consumption (Brunsø, 2003; Olsen, 2004; Verbeke and Vackier, 2005). Nevertheless, in case of dry fish, it was found that price and cost fail to establish significant relationship with behavioral intention and consumption. This result has illustrated that dry fish is not prefer for its low price, it is consumed as a part of our culture and for its nutritional value. The results of this study confirmed that new marketing strategy for dry fish business should be implemented to expand domestic market from small

grocery shop to large shopping centre; because it is not only consumed by low-income people but also consumed by high-income people.

In academic aspects, the present study proved that TPB are suitable to predict and explain dry fish consumption behaviour in Bangladesh. This study has also shown that behavioral intention can be explained and predicted by attitudes, norms and procedural knowledge and dry fish consumption behaviour is determined by intention, attitude, norms and perceived risk. This study is found that perceived quality is the best predictor of attitude; it implies that the quality (taste, texture and appearance) is the most important attributes to the dry fish consumers. This study is also demonstrated that family expectations and social pressure is a significant and strong indicator of intention and dry fish consumption. Fishbein and Ajzen, 1975 says that external variables such as age, sex, household income, may influence the consumption and its predictors indirectly. However, in this study, demographic variable are not taken into consideration. Therefore, these demographic and economic factors should be investigated further in future studies.

5.10 Limitation and suggestion for future researches

This research is based on a convenience sample from Chittagong city of Bangladesh. Thus, the results are not necessarily representative of the whole population. Future study should include a more representative sample in Bangladesh to portrait the real picture of dry fish consumption in Bangladesh. This study did not consider the socio-demographic variable to explore consumer's attitudes, intention and consumption of dry fish. In the future research, demographic variables should include in explaining dry fish consumption behaviour.

As stated in the earlier chapters in this study the research did not focus on any specific species of dry fish. Thus, this research has explored only the general dry fish consumption pattern. However, detailed and extensive study will require for identifying complete consumption pattern as well as the species-specific effects on dry fish consumption.

Even though, the production process of dry fish is not completely hygienic and safe, it is found that product and nutritional knowledge could not able to establish any significant relationship with behavioral intention and behaviour. Future investigation

is needed to measure consumer's product and nutritional knowledge with extension of some items associated with production knowledge of dry fish.

In this study, perceived risk is found to be a very important motivational dimension of dry fish consumption behaviour. Among the 6 items associated with risk constructs, 3 items had been excluded for the higher cross factor loading. However, the future researches should look for different ways in expressing the items or find more specific items to measure the risk constructs.

Finally because of the small sample size ($n = 208$), the present model does not address the strong possibility of non-linear relationships or interactions among the constructs of interest. Understanding the cost and time investment for a larger sample, further studies are suggested by involving the full causal model of TPB and the risk and knowledge model, which involves all salient beliefs of product attributes, and extension of TPB by adding other important constructs such as descriptive norms (Tuu *et al.*, 2008), moral obligations (Olsen, 2004), ambivalence (Povey *et al.*, 2000), habit (Bruijn *et al.*, 2007; Holkanon *et al.*, 2005; Bruijn *et al.*, 2008; Saba and Natale, 1999) and trust (Ahamed, 2009; Lob *et al.*, 2007; Mahon *et al.*, 2006; Pieniak *et al.*, 2008).

In addition, several studies shown that past behaviour could predict later behaviour independently (see a review of Conner and 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 and Conner, 1999). However, such types of data causes conceptual problems since the causal ordering in the TPB is violated and as Budd, 1987 mentioned that associations between TPB constructs might become artificially inflated (Bruijn, et. al., 2008).

Like other studies in the domain of TRA/TPB, this study used structured questionnaire to assess the components of TPB, which is subject to criticism (Armitage, and Conner, 1999). In this regard, empirical research supports that structured TRA questionnaires produced considerably stronger correlations between components than randomly constructed questionnaires (Budd, 1987). 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).

Despite of the limitations, the findings and suggestions of this study are significant to the dry fish industry as well as in the academic literature. As the study is not a country representative study, the results should not be generalized for the whole country.

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Appendix 1 Factor loading, Cronbach's Alpha, and explained variance within TPB Model

Items	Attitude	Norms	Intention	PBC
When I eat dry fish, I feel bad / good	.89			
When I eat dry fish, I feel unsatisfied / satisfied	.73	.45		
When I eat dry fish, I feel unpleasant / pleasant	.75			
When I eat dry fish, I feel dull / exiting	.73			
When I eat dry fish, I feel negative / positive	.87			
My family expects me to eat dry fish		.86		
My family wants me to eat dry fish		.77		
My friends/relatives think that I should eat dry fish		.79	.31	
My friends/relatives want me to eat dry fish		.81		
My culture/religion wants me to eat dry fish		.68	.44	
I plan to eat dry fish		.31	.79	
I expect to eat dry fish			.87	
I want to eat dry fish	.32		.84	
I desire to eat dry fish			.91	
How much personal control do you feel over eating dry fish?				.82
For me to eat dry fish is				.91
If I want, I can easily eat dry fish tomorrow				.92
Cronbach's alpha	.91	.91	.94	.86
Explained variance (%)	21.90	21.66	20.56	14.03
Cumulative explained variance (%)	21.90	43.56	64.12	78.15
MSA=0.80; Bartlett test < 0.001				
<i>Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.</i>				

Appendix 2 Factor loading, Cronbach's Alpha, and explained variance of other constructs

Items	Perceived Risk	Product and nutritional knowledge	Procedural knowledge	Price and cost
I am concerned that it will not be as I expected	.53		.70	
If I were to purchase...worry about losing/wasting money	.53		.55	
I would worry....product not tasting as good as it should	.39		.71	
Purchasing dry fish....feel psychologically uncomfortable	.89			
I would become concerned..... long-term risks	.87			
Purchasing dry fish is unfashionable.... lower status	.73			
I know what kind of dry fish is safe and unsafe		.81		
I know what kind of dry fish is healthy and unhealthy		.84		
I have good knowledge.....nutrition dry fish contains		.60		
I know what kind of dry fish is rich in nutrition		.75		
I find it easy to prepare delicious and tasty meals			.85	
My friends consider me as an expert....dry fish			.83	
I have a lot of knowledge how to evaluate the quality			.80	
I know a lot about the risk for eating dry fish			.89	
My friends consider me as an expert on the risky aspect			.81	
I have a lot of knowledge... if dry fish is risky to eat or not			.85	
Dry fish is not expensive - expensive				.90
Eating dry fish is good value for money				.89
I choose to eat dry fish because...economical				.89
Eating dry fish is suitable for my budget				.86
Cronbach's alpha	.85	.75	.91	.91
Explained variance (%)	27.84	15.81	14.78	12.13
Cumulative explained variance (%)	27.84	43.65	58.43	70.56
MSA = .76; Bartlett test < 0.001				
<i>Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.</i>				

Appendix 3 Summary of the extended –TPB model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.585 ^a	.343	.340	1.126	
2	.701 ^b	.491	.481	.998	1.907
3	.715 ^c	.511	.499	.981	
4	.718 ^d	.516	.499	.981	
5	.718 ^e	.516	.496	.983	

a. Predictors: (Constant), INT

b. Predictors: (Constant), INT, PBC, ATT, NORM

c. Predictors: (Constant), INT, PBC, ATT, NORM, RISK

d. Predictors: (Constant), INT, PBC, ATT, NORM, RISK, KNOW_1, KNOW_2

e. Predictors: (Constant), INT, PBC, ATT, NORM, RISK, KNOW_1, KNOW_2, PRICE

f. Dependent Variable: FREQUENCY

Appendix 4 ANOVA of the extended _TPB model

ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	136.141	1	136.141	107.416	.000 ^a
Residual	261.090	206	1.267		
Total	397.231	207			
2 Regression	195.130	4	48.783	49.000	.000 ^b
Residual	202.100	203	.996		
Total	397.231	207			
3 Regression	202.970	5	40.594	42.211	.000 ^c
Residual	194.260	202	.962		
Total	397.231	207			
4 Regression	204.894	7	29.271	30.437	.000 ^d
Residual	192.337	200	.962		
Total	397.231	207			
5 Regression	204.938	8	25.617	26.511	.000 ^e
Residual	192.293	199	.966		
Total	397.231	207			

a. Predictors: (Constant), INT

b. Predictors: (Constant), INT, PBC, ATT, NORM

c. Predictors: (Constant), INT, PBC, ATT, NORM, RISK

d. Predictors: (Constant), INT, PBC, ATT, NORM, RISK, KNOW_1, KNOW_2

e. Predictors: (Constant), INT, PBC, ATT, NORM, RISK, KNOW_1, KNOW_2, PRICE

f. Dependent Variable: FREQUENCY