

'It's complicated': tier-based adoption barriers to in-home fish consumption of Indonesian urban consumers

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Abstract. The purpose of this study is to identify barriers to the adoption of in-home fish consumption by consumers in developing countries. The results of this study provide a timely understanding of fish consumption behavior that will help developing countries create more effective and efficient fish consumption promotion campaigns. The complexity of the problem of fish menu adoption is mapped and a strategy for campaign programs is proposed. The consumer expression "it's complicated" conveys multiple meanings, as discovered by the ethnographic study in this paper. The various barriers that appear at each stage of the consumer's daily journey constitute a tier-based, hierarchical set of layered barriers. Hence, trying to solve this problem with a simple and superficial marketing communication strategy will not result in a significant increase in fish consumption. Some of the fish consumption adoption barriers found during the study are not completely new and some repeat the results of previous studies. This study also presents the discovery of certain variables that have not been previously discussed. We provide a tier-based adoption barrier model of in-home fish consumption to explain why fish consumption is not growing significantly in developing countries, despite the notable budget spent on marketing communication activities.

Key Words: adoption barriers, consumer, ethnography, fish consumption.

Introduction. Some developing countries from archipelagos consisting of many islands and beaches surrounded by water present a vast potential regarding marine resources and products. Fish catch in these countries bring in foreign exchange via the development of fish exports. However, domestic consumption has not received much attention. Recently, given the high nutritional quality of fish, the authorities have realized that fish consumption should be increased domestically to improve the health status of the nation.

As a source of animal protein, fish is a highly nutritious food source with a much better protein absorption rate than other animal proteins, like poultry or cattle (The Indonesian Ministry of Health 2017; The Indonesian Ministry of Maritime Affairs and Fisheries 2016). In addition, fish is a source of omega-3 for the brain, which can help improve the intelligence of children. The contribution of fish in supporting brain development and being a source of protein for body growth is what has made fish the focal point of the activities of the Indonesian government in recent years.

Unfortunately, the habit of eating fish is generally not widespread in society and no significant improvement has been observed in this regard. In Indonesia, for instance, although the trend of per capita fish consumption during 2011–2015 showed an increase of 6.27%, this figure remains far from the expected target. Researchers have studied this genuinely ironic pattern of many of the world's coastal communities being characterized by low fish consumption (Can et al 2015) for a long time. Another example is Peru, which is a large producer of fish and fish products, having significantly contributing to trade and

the availability of jobs for its people; however, the domestic consumption of fish in Peru is still below average. In this country, fish consumption is still below the minimum recommendation, twice a week (Birch et al 2012; Verbeke et al 2005).

The Indonesian Ministry of Maritime Affairs and Fisheries (MMAF) has made a significant effort to increase national fish consumption. As stated in the report of the Directorate General of Strengthening Competitiveness of Marine and Fishery Products, the barrier to fish consumption in households, which is used as a basis for government activities, is the perception of fish being expensive and limitedly available (The Indonesian Ministry of Health 2017). In addition, especially for middle and low classes that have a low level of education, it is believed that consumers are unaware of the benefits of fish consumption for their families and, as a result, have not prioritized fish consumption (Sokib et al 2012). Besides, another study suggests the issues of production site environment, product quality and food safety that have to be addressed to strengthen consumer confidence (Andalecio et al 2014).

Various activities have been conducted as part of the movement to popularize fish consumption. Such activities have included educational activities, discussing the processing and the benefits of fish, counselling and cooking or fish menu creation competitions. The success of these heavily managed national events has not been followed by concrete results in the context of changing the habits of fish eating in people's homes. Typical mothers, as decision makers regarding the food menu at home, still prioritize poultry as the main source of protein; this is reflected in the insignificant increase of national fish consumption (The Indonesian MMAF 2016).

Studies of consumer behavior in the context of barriers to fish consumption in other countries have been widely carried out in Europe, Latin America, Asia and Australia. For example, Verbeke et al (2005) and Verbeke & Vackier (2005) studied consumer behavior in Belgium. The primary obstacle experienced by consumers is the lack of understanding and ability to determine the freshness of seafood at the time of purchase, even though the respondents understand that fish could help reduce the risk of heart disease and cancer and is useful for a normal, healthy body development.

Brunso et al (2009) conducted a research on this matter in Spain and Belgium and the results based on a qualitative study with 6 focus group discussions (FGD) show that the primary barrier is the perception of high prices and the unpleasant smell of fish while it is cleaned and cooked. In Australia, a study of Birch et al (2012) explores insights obtained from a total of 60 respondents through interviews and confirmed by an online survey with 1815 responses. The difficulty in determining the quality of fish, the perceived high price and disliking the taste and texture of fish are some of the inhibiting aspects observed in the study. Alemu & Adesina (2016) studied Ethiopian consumers, examining 420 households with the help of a questionnaire. They identified important barriers, including the lack of fish supply and the lack of experience in eating and cooking fish.

Fish consumption is not limited to the consumption of sea fish, also extending to freshwater fish, as was studied by Badr et al (2015) in Morocco. Some of the factors that inhibit the consumption of freshwater fish are the taste of mud, unpleasant texture and numerous bones. These factors have an impact on the convenience of fish consumption and require more effort, time or skills in the supply process (acquisition, preparation, eating and cleaning). The survey covered 220 consumers buying fish in various food outlets. A European study by Trondsen et al (2003) explains that arising constraints in eating fish are the lack of fresh fish supply, inconsistent quality, having few choices and the dislike of fish by the family members. Consistent with Trondsen et al, Olsen (2004) also describes other factors that create barriers to eating fish, including the price factor, convenience, knowledge and availability of quality products for certain market segments.

Among the various studies cited above, not many have examined fish consumption more holistically by considering the dynamic of the daily journey of the consumer and close observation of more actors involved in the journey, to develop a multidimensional picture of the problems faced by consumers. Therefore, this study is among the first studies that offer a more structured approach, to obtain a deeper understanding and more dimensional insights via an ethnographic method, investigating

the complexity and the root causes of barriers to in-home fish consumption adoption. The ethnographic study is widely used in understanding the complexity of consumer behavior, such as in the transfer of food learning within the family with young consumers (Ayadi & Bree 2010).

Material and Method. This qualitative study was conducted in the urban area of Jakarta, a metropolitan city and the capital of Indonesia. As a capital city, many of its residents come from different hometowns and represent their different cultures and backgrounds. Since food consumption has a cultural linkage, including respondents from this area enriched the results. An ethnographic approach was selected for the qualitative study method and used to investigate complex issues such as the attitudes, behaviors, value systems, cultures and lifestyles of people (Brewer 2000). As described by Coulon (1995) and Lassiter (2005) ethnography assist researchers to capture stories thoroughly and using a systematic examination to identify the issues in the everyday life, closer to reality. This often gives deeper explanation of the 'reasons why' and 'how come' questions of consumer behavior (Rubin et al 2005).

The ethnographic method used in this study is structured with a series of qualitative techniques, such as netnography, observations, day-in-the-life participatory observations, in-depth interviews and focus group discussions. The study began with a netnographic exploration, a qualitative technique that was carried out by the deep exploration of consumer behavior and perceptions of fish consumption found on the internet. Kozinets (2002) suggested exploring this technique before conducting on-site ethnographic studies on day-to-day lives of consumers in order to generate preliminary insights. A variety of online forums, websites and social media platforms were analyzed to obtain an in-depth picture of consumer experiences, perceptions and behaviors regarding daily fish consumption activities. The netnography study items are described in Table 1.

Table 1
Online resources for netnography

| <i>List of online forums</i> | <i>List of online news platforms</i> | <i>List of social media platforms</i> |
|------------------------------|--------------------------------------|---------------------------------------|
| Kaskus.com (10 threads) | Kompas.com | Twitter |
| Female Daily (8 threads) | Republika.co.id | YouTube |
| Ibu dan Balita (10 threads) | Metrotvnews.com | Facebook |
| | Antaraneews.com | |
| | Prfmnews.com | |

As a follow-up of the netnography, on-site observation was conducted by visiting many different locations, including a fish auction market, traditional markets, modern markets, supermarkets and mobile vegetable and meat sellers found around the homes of consumers. By using many variations of research techniques, the study applies the validity principle, consisting in data triangulation of the insights derived from each step. At each observation point, the interaction between fish buyers and sellers was documented. The purchase behavior of each actor was analyzed. In addition to the purchase points, the observations were made outside consumption points. This out-of-home consumption observation was carried out in 3 locations. Each observation location is described in detail in Table 2.

Further insights were obtained by shadowing, which is also called the "day in the life technique", and it consists of participating directly in the daily lives of consumers, including shopping at the market, going to the supermarket and observing consumers cooking in the kitchen and serving food to their families. This technique helps uncover important stages in the structure of consumer barriers to the preparation and consumption of fish. The barriers consist of layers and not every consumer group has the same set of problems.

Table 2

Observation locations

| <i>Type</i> | <i>Location name</i> | <i>Total</i> |
|--------------------------|--|--------------|
| Fish auction market | Pasar Muara Angke | 1 |
| Traditional market | Pasar Ciledug, Pasar Jombang, Pasar Ciputat, Pasar Ceger, Pasar Ciracas, Pasar Kramat Jati | 6 |
| Modern market | Pasar Modern Bintaro, Pasar Jaya Senen, Pasar Modern Majestik | 3 |
| Supermarket | Hero, Lotte Mart, Hari-Hari, Farmers Market | 4 |
| Vegetable street vendors | Jakarta – Tangerang Area | 5 |
| Out of home | Muara Angke, Kalibata, Tebet | 3 |

This study utilized a purposive sampling method - the housewives selected for this study are those who have a high interest in the health of their children and families. The study continued with in-depth interviews. The first round of interviews, labelled as external expert interviews, consisted of an officer from the Indonesian MMAF and the 4 experts from fish industry associations. The second round of interviews covered housewives and housemaids. In the last interview round, both unstructured and structured interviews were conducted with sellers and traders from the traditional markets visited during the onsite observations and day-in-the-life observations. To summarize, the in-depth interviews were conducted with 5 experts, 23 housewives, 5 housemaids and 25 traders.

Housewives were chosen for interviews because they have a primary role in Indonesian family culture in preparing and deciding the daily menu. There are segmentations on this basis, such as ability to cook and to prepare meals. In some Indonesian modern families, housemaids have a significant role in influencing and deciding the meals. In addition, housemaids must have minimum cooking skills to prepare breakfast, lunch and dinner. Sometimes, housewives interfere in requesting the menu for the family and they have limited knowledge about cooking. Therefore, it is relevant to gain more insights from housemaids regarding fish preparation. FGD were conducted with 12 mothers who have children attending elementary school. Mothers who took part in the FGD were selected based on their behavior towards daily fish consumption, their access to information through their electronic devices and their concern for protein sources for their children. Detailed profiles of 23 housewives as respondents are described in Table 3.

Ethnographers and interviewers with good communication and interviewing skills conducted the interviews. The interviewer who was most qualified in conducting qualitative research methods started the interviews by presenting the objective of the study. The researcher used a question guide that included the main questions. A semi-structured guide that consisted of open questions enabled the respondents to fully explain their personal opinions, perceptions and experiences. The main questions were followed by additional questions to fully capture the required data. The researcher stopped the interview once data saturation occurred. In this study, data collection and analysis were carried out simultaneously and the collected data were analyzed via a content analysis method.

The profile of respondents

| <i>Characteristic</i> | <i>Profile</i> |
|------------------------|---|
| Cooking skill | 91.3% of population has high cooking skills and the rest (8.7%) has low cooking skill. |
| Fish eating frequency | Most of the respondents (39.1%) eat fish 1-2 times a week, followed by those who eat fish every 3-4 times a week (34.8%). Only 17.4% of respondent eats fish almost every day. In addition, 8.7% respondents rarely eat fish, once a month. |
| Fish cooking frequency | Most housewives (43.5%) cook fish 1-2 times a week. Only 26.1% population cook fish 3-4 times a week. Housewives who eat fish almost everyday and only once a week are following with 17.4% and 13%, respectively. |

Note: 23 housewives were interviewed.

Results and Discussion

Theoretical framework. Two theories that are found suitable to explain the consumer behavior studied in this research are the diffusion of innovation theory (Rogers 2003), and the purchase funnel theory, which was built from a William W. Townsend concept in 1924 in the book *Bond Salesmanship*, written by Strong (1925).

Traditionally, Rogers' adoption barriers, such as relative advantage, compatibility and complexity are considered to have a linear relationship with the intention to use new products or technologies. On the other hand, purchase decision making has a hierarchical process in the purchase funnel theory. These two concepts are useful for explaining why fish consumption is not growing significantly in developing countries, despite the huge budget spent in marketing communication activities.

Diffusion of innovation theory. Relative advantage is the level of acceptance due to an innovation being regarded as better when compared to the idea it is replacing. Relative advantage can be measured from several aspects, such as economic, social prestige, comfort and satisfaction (Rogers 2003). In the context of in-home fish consumption, the comparison is with other sources of protein whose taste and texture consumers are familiar with, such as poultry, particularly chicken.

Compatibility is the measurement of the extent of innovation consistency with existing values, past experiences and the potential needs of adopters (Rogers 2003). Compatibility in household consumption varies with the experiences of those who decide the food menu as well as their knowledge of the nutritional quality of fish for their families.

Complexity occurs when the innovation is considered relatively difficult to be implemented and understood (Rogers 2003). In the context of fish consumption, complexity refers to the extent to which a cooking technique is considered easy or difficult to understand and carry out. It is also related to the level of cooking knowledge of the mother and/or housemaid. Generally, complexity is discussed in terms of the knowledge of fish-based cooking recipes. Many fish recipe competitions are conducted every year in the hopes of reducing the complexity of fish cooking.

Purchase funnel model. The hierarchy of effects model by Lavidge & Steiner (1961) is a model of consumer buying behavior that explains how customer reactions to communication go through stages to reach a step of action or a behavior. A similar hierarchical model is described in the AIDA model: awareness – interest – desire – action, an applied a stimulus-response model. Marketing communication operates as a stimulus, and the purchase decision is a response, known as the purchase funnel (Townsend 1924). The purchase funnel model is a consumer-focused marketing model that illustrates the theoretical customer journey towards the purchase of a product or service.

The purchase funnel illustrates the relative number of prospective purchasers over time (Figure 1). The model of buying behavior explains the problem at each touch point of the consumer journey in fish consumption and suggests that communication activities to reduce barriers should be adjusted to contextual problems. Presently, both the government and fishery industry players do not have a holistic understanding of adoption barriers. Many educational and communication activities conducted have turned out to be ineffective and inefficient.

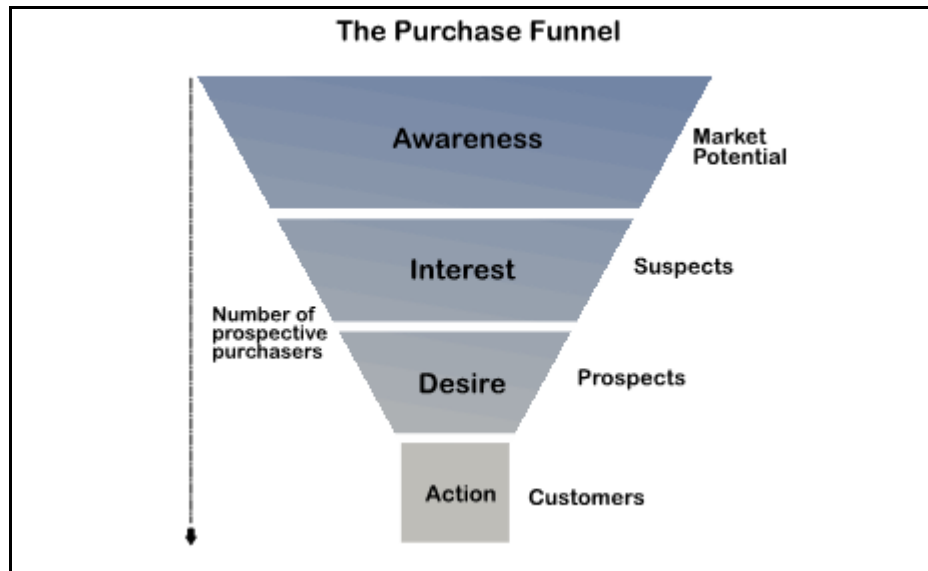


Figure 1. The purchase funnel model (Townsend 1924).

Insights from ethnographic study. The expression: 'it's complicated' was always raised when respondents asked the reason why they did not provide a fish menu at home. It is important to reveal the underlying meaning of that statement among consumers in different contexts, and to establish what the consumers actually mean by 'it's complicated'. The complexity of the problem of fish consumption adoption can be resolved when the sentence 'it's complicated' is elaborated upon in each relevant context so that the solution to the problem becomes more specific and precise. The preliminary assumption indicates that the barrier is not based on demographic aspects, such as the socioeconomic class, but rather on behavior related aspects. There must be contextual situations that differentiate the underlying meaning of 'it's complicated'. The high price of the fish and the limited availability, as the two of the most widely known problems, are useful as starting points for examining the issues.

Some of the fish consumption adoption barriers found during the study are not completely new and some are repeated from previous studies. However, this study presents findings of certain variables that have not been previously discussed to our information, including:

1. A lack of knowledge on how to handle fish after purchasing and before arriving home; some consumers do not immediately go home and store fish in the refrigerator; as a result, the quality of fish, especially its freshness, is reduced.
2. A lack of knowledge about fish cooking techniques or techniques that have not been mastered well. Hence, fish that is of good quality at the time of purchase is sometimes served at sub-par quality at the dining table.
3. The difficulty of persuading families, especially children, to eat and enjoy the fish menu that is served. Children have a different benchmark for 'a delicious, fun food', and unfortunately, fish is often not included on that list.

Fish consumption adoption barriers appear to be hierarchical and tier-based and not as linear as previous studies have suggested. The position of the problem differs between the two potential models; in the former, the first problem occurs at one point in the hierarchy, but solving that problem will not necessarily solve the remaining problems.

This is in line with the hierarchical effect model in the purchase funnel theory (Figure 1), where issues have to be solved one-by-one as part of a process. It is a waste of communication budgets for advertising to focus on educating consumers on only one barrier.

From the beginning of the study, the phrase 'complicated' dominated the pain point findings regarding consumers when they are at home, when they are compiling a menu, when they are shopping and when they are at home preparing fish-based food for their families. These complicated pain points are the focus of this research: there are different explanations for the same declaration of 'it's complicated'. Therefore, this research explores what consumers mean by the word 'complicated' at each different touch point using a more in-depth and multi-dimensional method.

Search results were categorized into seven touch points of interaction between consumers and fish during the consumer journey and each touch point carried different problems. The seven touch points include the following:

1. Compiling the daily menu.
2. Shopping for fish near the home.
3. Shopping at a traditional market or supermarket.
4. Returning home after shopping.
5. Preparing the food in the kitchen.
6. Choosing and cooking a fish-based recipe.
7. Presenting the food at the dining table.

Interestingly, solving one problem at one touch point is not enough to encourage fish consumption because other hidden problems at earlier touch points in the journey might still serve as a barrier. The problems were classified in several tiers according to the consumer journey. Tier 1 is where the first interaction touch point begins, when the menu for the day is compiled. Tier 7 is set as the highest hierarchy of problems, when a fish-based menu is ready to be served. This adoption barrier is arranged as a tier-based, hierarchical series in which the problems of each tier must be resolved first before moving onto the next tier's problems, as explained in Table 4. The sequence of the seven touch points is summarized in Figure 2.

As explained by Rogers (2003), this relative advantage, complexity and compatibility exist in various touch points within different contexts. The following is the link between research findings with each of Rogers's adoption variables and its analysis.

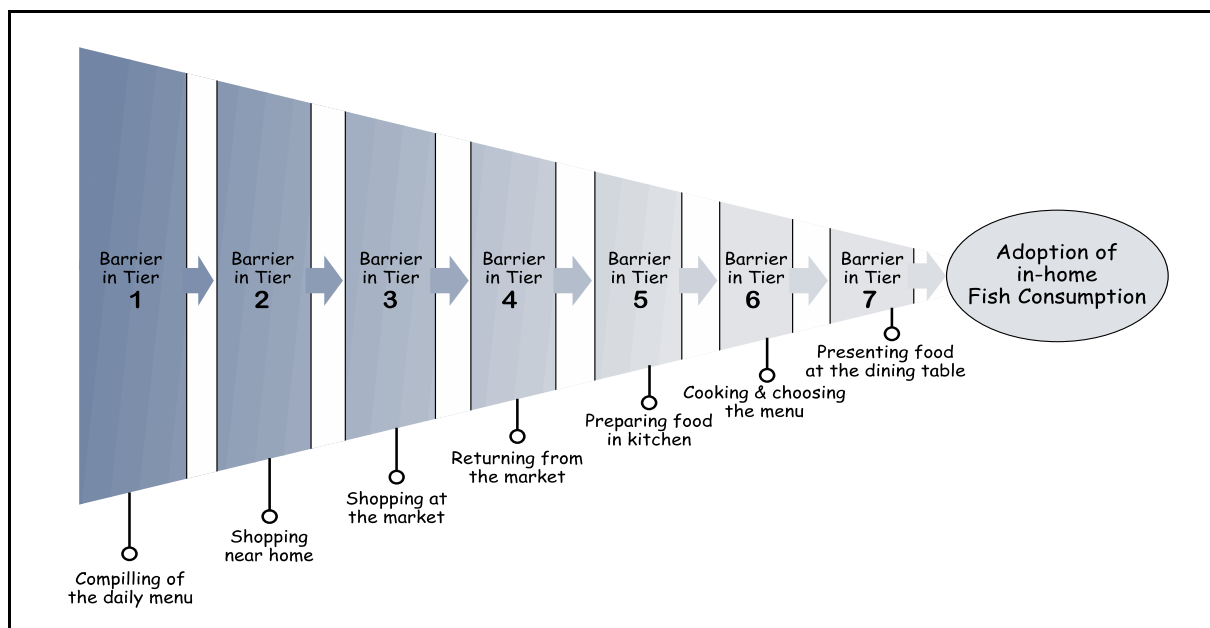


Figure 2. Tier-based adoption barriers of in-home fish consumption.

Relative advantage as an adoption barrier. In this study, relative advantage was found in Tier 1, Tier 3, and Tier 7. In Tier 1, one relative advantage barrier is the comparison to other sources of protein. Chicken is still considered the best option by many respondents because of both the perception of chicken being less expensive and the perception that children will like the taste and texture of chicken more when compared with fish. In Tier 3, at the fresh markets, a lack of knowledge about fish quality makes consumers think twice about choosing fish over poultry. In Tier 7, the problem was convincing children to eat fish instead of other favorite foods, such as chicken nuggets and fried chicken. Children have a benchmark of 'fun food', which was the inhibiting factor at the end of the final touch point (Tier 7).

Compatibility as an adoption barrier. This variable of compatibility was found in Tier 1, related to past experiences, as mothers who were not raised in a family with a tradition of eating fish since early childhood are hesitant and reluctant to cook fish for their own families. This is a serious barrier, because breaking such tradition takes time and requires the effort of the whole community. Mothers who are hesitant to cook fish at home are not easy targets for marketing communication activities. Big events, such as cooking competitions and recipe creation competitions, will not solve these problems since for such mothers, the issue goes beyond not knowing how to cook or not having great fish recipes. These mothers essentially need different motivation to ensure that their perceptions of low compatibility are reduced. Education about fish as a food that will benefit their children's intelligence will boost the emotional benefit of serving fish and probably provide better motivation than a cooking event would.

Complexity as an adoption barrier. Complexity is found in more than one touch point. In Tier 2, complexity is dominated by availability issues, as it is difficult to buy fresh fish near home. The mobile vegetable vendor hardly carries fresh fish on a daily basis. In Tier 3, when consumers interact with a fish vendor at a fresh market, they have difficulty checking the quality and freshness of the fish. In Tier 5, consumers complained about the longer preparation time required for cooking fish and the complexity of the cooking techniques for fish. Interestingly, in Tier 6, the assumption that such complexity means the consumers do not have a wide enough range of cooking recipes is not entirely true. Consumers said that it is not about the recipes because when they want fish, they can easily Google a recipe. The hard part is not having a recipe. This is in contrast to the efforts of the Fish Consumption Movement campaign that emphasizes the creation of fish recipes based on the assumption that a lack of recipes is the major barrier to the adoption of fish consumption. Many fish recipe competitions are conducted by the Indonesian government every year based on the assumption of the need to reduce the complexity of cooking fish. This study found that such efforts are neither effective nor efficient.

Multiple Meanings of 'It's Complicated'. The various adoption barriers in the series of touch points described in Figure 2 provide a better overview of the complexity of fish consumption adoption barriers. Without a total understanding of the list of barriers in each tier, it is hardly possible for the government and other fish stakeholders to solve the fish consumption problem.

The meaning of the expression 'it's complicated' becomes clearer and more multidimensional in accordance with the context of each touch point. There are times when the same problem reappears at different touch points. For example, 'complicated' at the touch points in Tier 1 (when compiling the menu) covers various problems and has more than one meaning. This includes the perception of complex cooking methods (which also appears in Tier 5). Experience with the difficulty of persuading children to eat fish that appears at a touch point in Tier 7 also appears in Tier 1.

Figure 2 gives a more complete picture of the collection of barriers that must be overcome before fish consumption can actually be adopted in the long term, not just in a momentary trial run. The settlement of consumer problems must be seen as a series of barriers within each touch point both at that point and after that point. For example,

consumers who have reached the fifth touch point are preparing fish in the kitchen and may need more help to be able to overcome the pain points at points 6 and 7, including knowing how to use fish as an ingredient in the kitchen without reducing its quality, learning techniques for cooking fish properly and having a choice of fish-based recipes that are simple and acceptable for the family. Another example is that consumers who are at a touch point in Tier 7 should be considered as having overcome problems from Tiers 1 to 6. For this consumer group, the task of the educator is to focus on Tier 7 barriers, such as teaching the consumers how to serve the fish dishes in such a way to be well-received and enjoyed by the family.

The reality observed in the field is that more consumers stop at Tiers 1-4 because this is where more technical difficulties occur. If issues in Tiers 1-4 have not been resolved, marketing communication activities that try to solve problems in Tiers 5-7 and 'Fish Consumption Movement' activities that are marketed through cooking competition events will be ineffective. A competition for making fish recipes is only meaningful when consumers no longer experience difficulties of Tiers 1-5. This layered representation has never been identified and discussed at either the academic or the practical level by business decision makers and policies. Fish stakeholders are still struggling to solve problems separately and have not considered them holistically. The various meanings of 'it's complicated' in each tier of in-home fish consumption adoption are described in Table 5. The following section of the paper is the elaboration of the barriers found in each touch point.

Barriers in Tier 1: thinking stage of arranging the daily menu. 'It's complicated' in this stage of daily menu preparation is dominated by perceptions on negativity or problematic past experiences, such as: (1) the perception based on experience that preparation and cooking processes would take a long time; (2) perception on difficulty to convince the family to consume the dish because the family rarely eats fish; (3) as the price is high, if the dish is not eaten and it is discarded, then a waste of resources occurs; (4) based on experience or word of mouth, there are concerns that fish will bring an allergic reaction and managing it will be a burden.

The perception of high price and taste not matching the preferences are aspects also observed in previous studies (Birch et al 2012). However, that particular study did not explain at which stage the perception of high prices appeared in the consumer journey. In contrast, in this study, it was observed that this perception had already been formed before the consumer even reached the market to buy fish. The objection to the price of fish is most dominantly associated with the word "complicated" in the menu preparation stage. At this stage, competition with other protein sources needs to be considered.

The problem is that fish is still rarely chosen as the primary consumption item in the family because it is rivalled by other protein sources that are considered easier to process such as chicken or eggs. The problem is also based on the fact that fish are not a customary part of family consumption since childhood, which also affects the current menu selection habits of families. In Tier 1, the benefits of fish nutritional value need to be discussed in greater depth and established in minds of consumers. Efforts to create an understanding that fish have the superior nutritional content for the growth of children and intelligence development may cause a reduction in the price barrier of expensive fish.

Another aspect is the assumption of respondents that the price of fish is high, resulting in a small portion compared to that of chicken or eggs that have nearly the same prices, but can be consumed by many family members. This assumption is especially important for the lower-middle class, which still emphasizes the preparation of many portions of a meal that, most importantly, allows consumers to become satiated. Hence, the combination of the high price of fish and a small portion becomes a separate complication for respondents.

Not limited to high prices, this aspect of "it's complicated" continues in thinking about the cooking process. The respondents feel that cooking fish requires a long time compared with that of other protein sources such as chicken and eggs, which tend to be

easier to process and do not require a long cooking time. It appears that the perception of fish that is imprinted on the mind of the mother as the main character presenting a menu at home is also hampered by the presence of family members who do not like the taste of fish. For the mother, the cooking menu is more practical if it is liked by all or almost all family members.

There are also findings that some family members have a perception that fish cause allergies. This is usually felt by family members in a poor physical condition or who consumed fish that was not fresh, therefore associating consumption of fish with subsequent allergic reactions. The perception of fish as causing allergies is a barrier to consumption of fish and is considered "complicated".

'It's complicated, right, from the very beginning when I bought it, it's already expensive, and the portions are small compared to chicken and eggs, which are priced similarly but suffice for several meals. Turn it out again when it's been cooking for a long time, ultimately, wasting an entire day's time.' (Mom, 37 years)

Barriers in Tier 2: finding fresh fish near the house. "Complicated" at this stage means that fresh fish markets or supermarkets are far away, and obtaining fish takes time and energy. The problems faced are primarily aspects that are considered complicated in fish consumption behavior, like being near one's own home and obtaining fresh fish. There are several preferred shopping locations for buying fish that can be selected. The location that is most easily accessible from home is a travelling vegetable seller. Mobile vegetable vendors are still the favorite of most respondents because buying from such vendors is efficient. However, the primary problem encountered in going to buy fish from a nearby vegetable vendor is fish not being fresh. This becomes important because the preparation of food requires quality ingredients that are fresh, to maximize the absorption of nutrients. These criteria are not satisfied by fish, as the respondents find it difficult to buy fresh fish for cooking and need to think about access to a market or a supermarket.

The difficulty of reaching a location to buy fresh fish is considered 'complicated' by the respondents. While it is known that fresh fish can be easily found at the fresh fish market, the location of the fish market where quality fresh fish is indeed available is far from where most consumers live. In addition, more time and costs are needed to be able to reach other purchase locations such as markets or supermarkets that provide various types of fish of better quality than the fish sold by travelling vegetable vendors. Hence, purchasing fresh quality fish is considered difficult by respondents because the suitable locations are far from their homes.

'It's easy to buy vegetables or fish from a vegetable vendor, because this can be done near one's home, possibly, within a walking distance. However, most fish are not sufficiently fresh; sometimes I have to go to the market or a supermarket, therefore it takes time to bring the fresh fish home.' (Mom, 41 years old)

Barriers in Tier 3: choosing fresh fish in the market. The "complicated" barriers at this stage represent: (1) stock problems; (2) incorrect storage problems and a lack of trader knowledge; (3) a lack of buyer knowledge of fish quality. The problem of choosing fresh fish or unavailability of fresh fish is an obstacle encountered by most respondents. This stock problem is considered troublesome because the respondent must try to find fresh quality fish for his or her family. In addition, the lack of knowledge of respondents regarding the selection of fresh fish also adds to the perception of complexity when buying fish. There were also respondents who could not even distinguish fresh fish from fish that was not fresh; of course, this complicated the process of fish purchasing. Sometimes, the respondents were solely focused on buying fish that was easily accessible without considering the quality of the fish in detail.

It turns out that the problems surrounding fish freshness are not only felt by consumers. One aspect of the lack of fresh fish stock is the lack of knowledge of fish traders regarding fish storage. Fish storage is important to maintain the quality and the

freshness of the fish itself. There are still many traders who do not pay attention to the freshness of fish, as they do not provide ice cubes with the fish they sell. In addition, vegetable vendors also tend to mix various types of fish and put them in a cooling box where ice has already melted. Maintaining fish quality becomes increasingly complicated, coupled with the lack of buyer knowledge regarding the quality of fish, making it infeasible to correctly purchase and process fish, which can affect the texture and taste of the cooked fish.

'Buying fish in the market or a supermarket, it doesn't guarantee that the fish is as fresh as it can be; sometimes, I see that there are fish that are already soft and have the same color. The problem is that there are traders in the market who don't put ice with the fish, huh... how can fish remain fresh?' (Mom, 43 years)

Barriers in Tier 4: knowledge on downgrade quality on transportation.

'Complicated' at this stage has the following meanings: (1) being in a hurry to go home immediately, and (2) not realizing that the quality of the fish has declined because the respondent was not aware of correct handling of quality fish. Respondents who buy fish usually encounter obstacles when travelling. Not all respondents purchase fish in the vicinity of their homes. Most respondents have to use vehicles when they go to buy fish. Maintaining the condition of fish to retain its quality should be considered by both buyers and sellers.

One way to keep fish in good condition is by surrounding it with ice cubes. Although the fish are taken in a bag instead of a box, ice cubes must be provided. The respondents did not think about the fish as it was transported to their homes and did not realize the importance of maintaining the quality of fish by keeping it fresh. Carrying fish with ice cubes will help it remain fresh during a long trip. Respondents rarely asked for ice because doing so added complexity and felt that they were in a hurry to go home immediately. Respondents feel that the fish that has been bought must be brought home immediately for immediate processing. However, surrounding the fish with ice will allow the fish to remain fresh longer. In general, many respondents did not know the correct handling process; hence, they also did not know that the quality of the fish would easily decline if the correct handling process would not be respected.

'If you go to the vegetable vendor, the available selection is limited. The market is not too close to my house, so I have to hurry if I buy fish again, so I can return home quickly. I rarely got a small bag with fish that was put into a large bag of ice cubes, as I saw and experienced it in a supermarket.' (Female, 30 years old)

Barriers in Tier 5: fish preparation before cooking. 'Complicated' at this stage means having to perform certain preparations because the respondents do not have household assistants. Moreover, because the fish is not ready to be cooked, it must be set aside for a while. After the respondent has purchased fish, he or she must prepare cooking ingredients to process the fish. Sometimes, this stage tends to make respondents lazy to cook fish. The respondents who cook themselves find it difficult because fish are different from other foods. Fish is considered to have a stinging fishy smell that can make people who cook it uncomfortable.

Those who are not accustomed to cooking fish may be disturbed by its flavor. Respondents felt that cooking fish was complicated because no one helped as a household assistant. Most of the purchased fish are raw; hence, the respondents have to perform fish cleaning prior to cooking it.

'Actually, the stage that invokes laziness is cooking, because you have to prepare everything yourself. Moreover, the fish I bought was raw, so it had to be cleaned prior to cooking; it was really complicated, especially because of the fishy smell and the process being dirty. The fish was not ready for cooking, nor was it as plentiful as chicken nuggets; right, if the fish were ready for cooking, without any household assistant, it would feel easy.' (Mom, 38 years)

Barriers in Tier 6: knowledge on fish recipes. 'Complicated' at this stage means that the collection of fish recipes is limited and one must learn the techniques of cooking fish. When a respondent cooks fish, usually the family or the respondent feels bored. This boredom is because respondents do not know various cooking ideas and cooking techniques. Often respondents complain of not having ideas for cooking fish. A lack of ideas poses genuine limitations in cooking fish properly and creating interesting dishes. Similarly, the other family members usually comment that the fish dishes are uninspiring and "that's all that".

Respondents feel that they do not have a significant collection of fish recipes. If they have a recipe book, it is merely for display. This behavior is because the recipe book is considered difficult to follow. Some respondents felt that they had to relearn the fish cooking technique. Many respondents are enthusiastic towards learning the proper and more diverse techniques of cooking fish; however, they perceive such knowledge to be inaccessible.

'If fish is to be cooked, it's certainly the same menu of my fish dishes. I'm really unsure as to what else to cook. This is because I don't have any ideas anymore if fish is to be cooked. There's a recipe book that covers fish, but it's really hard for you to follow it. It's troublesome. Yes, I want to learn how to cook fish to create new dishes, but where do you learn?' (Mom, 45 years)

Barriers in Tier 7: good presentation at the dining table. 'Complicated' at this stage has the following meanings: (1) children prefer chicken or eggs, so the process of eating becomes longer because children have to be persuaded to eat, and (2) husbands complain about taste and texture because the fish was not cooked correctly. Presenting a fish dish is something that is usually done by the mother. When cooking fish, a mother must ensure that all members of her family eat fish. Usually, children and husbands become the primary focus of mothers, because every dish they cook will be directly commented on by their children and husbands.

It is important to present a menu at home that is liked by all family members, especially children who are still in their infancy. The existence of perceived problems in the presentation of fish dishes is felt by children, where the process of eating becomes longer because children must be persuaded to eat fish. One reason is that children are not accustomed to consuming fish from an early age and are more accustomed to eating a menu of chicken and eggs, which will certainly become more familiar to the child. There are also consumers who state that sometimes children need to be fed by the mother for them to want to eat fish, because children avoid the fishy odor that attaches to the feeding hand and are worried about choking on fish bones. Respondents have difficulties when presenting a fish menu to their husbands, as husbands usually feel that the fish dishes are not as delicious as chicken dishes.

'The most difficult part of my day is when a child eats fish; because of being too lazy to separate the spines, my youngest child is afraid of choking on bones. The child has to be persuaded first; I even have to listen to him, so that he wants to eat fish.' (Mom, 42 years)

Table 4 summarizes the various meanings of the expression 'it's complicated' at seven touch points from Tier 1, when consumers are compiling the daily menu, to Tier 7, when they need to serve the fish-based dishes to their families at the dining table.

In the new model used in this study, each adoption problem must be linked to the context of its relevant touch points and to the other problems, as well as arranged hierarchically through a holistic understanding of the consumer journey. Each barrier is a blocking factor at a given touch point that must be resolved before dealing with the barriers at the next touch point.

Table 4

Various meanings of 'it's complicated' in each consumer touch point

| <i>Touch point</i> | <i>Activity</i> | <i>Problem</i> | <i>'It's Complicated' Barrier</i> |
|--|--|---|--|
| Tier 1: Compiling the daily menu | Arranging food menus for the family | Fish is still rarely an option. Since childhood, family members have not been used to eating fish. | 1. Fish seen as expensive; 2. Fish seen as difficult to cook; 3. Family disliking fish; 4. Fish seen as the cause of allergic reactions; 5. Lack of knowledge about fish being healthy/nutritious. |
| Tier 2: Shopping near home | Looking for a nearby mobile vegetable and meat vendor who sells fresh fish | Fresh fish is usually not found at the vegetable vendor. May not have access to a fresh market. | 1. The fresh fish market is far and it takes resources to reach it; 2. When fish is available, the handling of fish by the vegetable vendor is not good and usually the fish lacks freshness. |
| Tier 3: Shopping at a fresh market | Finding and choosing fresh fish | Fresh fish does not exist or cannot be distinguished by the consumer. | 1. The buyer cannot tell which fish is fresh and there is a lack of knowledge about fish quality; 2. Supply issues; 3. Trader handling is minimum. |
| Tier 4: Returning from the market | Maintaining the quality of fish | Not aware that problems can occur when fish is exposed for too long. | 1. In a hurry to go home immediately; 2. Do not realize the quality of fish has decreased due to their lack of knowledge about fresh fish. |
| Tier 5: Preparing fish in the kitchen | Preparing the fish as a cooking ingredient | The smell of fish. Hands become dirty. Uncomfortable. | 1. If there is no household assistant or the fish is not ready to cook, then the preparation of fish must be done and experienced alone; 2. Still not aware of the fish fillet option. |
| Tier 6: Choosing and cooking the menu | Completing the fish-cooking Process | Fish menu is limited, Do not have the skills or techniques for cooking fish properly. | 1. Limited collection of fish recipes; 2. Must learn complicated fish-cooking techniques. |
| Tier 7: Presenting the fish at the dining table | Serving the fish menu well; ensuring that families eat the fish dish | Children choose chicken over fish dishes. Children have a benchmark for fun and tasty food and fish is not on the list. | 1. The process of eating becomes longer because the children must be persuaded; 2. Husbands complain about the taste and texture because the cooking is probably not done properly. |

Table 5 summarizes the barriers that were identified in previous studies, which were generally one-dimensional and covered only a few touch points, while the current study includes all barriers related to in-home fish consumption along the entire consumer journey and covering all touch points. From Table 5, it can be seen that previous studies have only examined the list of adoption problems/barriers of fish consumption from a viewpoint in which the inhibiting factors are linear and not related to one another.

Table 5

Comparison among studies in terms of adoption barriers of fish consumption in the consumer journey

| <i>Study</i> | <i>Type of Barrier</i> | <i>Barrier Stage</i> |
|---------------------------------------|--|--------------------------|
| Verbeke et al (2005); Belgium | Lack of understanding and ability to determine seafood freshness when making purchases. | Tier 3 |
| Brunsnø et al (2009); Spain & Belgium | Perception of the expensive prices and unpleasant smell of fish, which is less preferred during the menu selection process when cooking. | Tier 1, 5 |
| Birch et al (2012); Australia | The difficulty to determine the quality of fish, the price of fish being perceived as expensive, and not liking the taste and texture of fish. | Tier 1, 3, 7 |
| Myrland et al (2000); Norway | Children become influencers in the provision of fish menus at home. | Tier 7 |
| Badr et al (2015); Morocco | Freshwater fish has muddy taste, bad texture, lots of bones. Requires more effort, time or skill in the cooking process. | Tier 4, 5 |
| Trondsen et al (2003) | A lack of a fresh fish supply, inconsistent quality, few choices and families who do not like the taste of fish. | Tier 2, 7 |
| Olsen (2004) | Price factor, convenience, knowledge and availability. | Tier 1, 2, 3, 7 |
| Current Study (2018) | All barriers were included and structured based on a touch point orientation. | Tier 1, 2, 3, 4, 5, 6, 7 |

Conclusions. The consumer expression 'it's complicated' conveys multiple meanings that have been discovered by the ethnographic study in this paper. Various barriers that appear at each stage of the daily journey of the consumer constitute a tier-based, hierarchical set of layered barriers. Hence, trying to solve this problem with a simple and superficial marketing communication strategy will not result in a significant increase in fish consumption. One national Indonesian event, the Fish Recipe Cooking Competition, aims to solve adoption barriers by providing many new recipe choices for consumers. However, the results of this study reveal that that event, which produces a collection of new recipes, is not effective because consumers are still left with other hidden adoption barriers to in-home fish consumption.

The academic contribution of this study provides a new understanding of consumer adoption theory; it is among the first studies to integrate the concepts of Rogers' adoption barriers and the principle used in the hierarchical effects model. This notion of tier-based barriers is a new concept that is useful for understanding the factors preventing the adoption of a product that faces adoption difficulties or includes a complex problem, such as fish in-home consumption.

Managerially, the results of this study clearly provide solutions for decision makers in the fish business and in state and community policy. Decision makers need to strategically reduce the cost of marketing, which has been ineffective and inefficient in its attempts so far. Then, with a new understanding from the insights obtained from this study, the contextual design of a marketing communication program that directly addresses the problems at each stage of fish consumption barriers may be commenced.

Acknowledgements. This work was supported by the Ministry of Research, Technology, and Higher Education, Republic of Indonesia, as a part of 'Penelitian Dasar Unggulan Perguruan Tinggi (PDUPT)' Research Grant to BINUS University, entitled "Mapping of the supporting and inhibiting factors of fish home consumption in the various behavioral-based consumer segments in Indonesia", with contract number: 024/KM/PNT/2018.

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Received: 9 May 2019. Accepted: 12 June 2019. Published online: 27 August 2019.

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How to cite this article:

Maulana A. E., Diniah, Setiawan D. P., 2019 'It's complicated': tier-based adoption barriers to in-home fish consumption of Indonesian urban consumers. *AACL Bioflux* 12(4):1300-1315.