Reliability and Validity of Consumers' Decision Making Investigation of Safe Street Food Purchasing, Pilot Study in Nakhon Si Thammarat, Thailand

J. Khongtong, M. S. Ab Karim, M. Othman, and J. B. Bolong

***Abstract*—Although street food has been the sources of unsafe food for consumption in the world including Thailand, it is interesting that many people are still choosing the food from here. The aim of this study is to investigate consumers' decision making regarding purchasing safe street food. There is very limited research in this area, therefore this study purposes to develop and test the quality of the instrument. The instrument was developed base on purchasing decision making model, and then tested the validity and reliability of data that collected from 150 pilot respondents by using SEM analysis. The results showed the drawn model was fit with the data. Moreover, the construct reliability (CR > 0.7), convergent validity (AVE > 0.5) and discriminant validity (AVE > r^2) were acceptable. As a result, this instrument is capable to be applied in main study and test the research hypotheses. This pilot study can confirm that the instrument is workable and minimize the potential problem that probably occurs according to unclear instrument.**

***Index Terms*—Consumer, decision making, food safety, reliability, street food, validity.**

I. Introduction

The changing lifestyles and food consumption have influenced today's consumer's food purchasing behavior. Food preparation at home is replaced by eating out and becomes more frequent. As a result to the number of meals prepared outside the household has increased dramatically. Beside the need for eating, consumers also seek for convenience, so street food is the best answer for consumers in many countries [1].

Street food, according to FAO is defined as ready-to-eat-food that is prepared or sold by street vendors or hawkers in the public places. There are various types of food stalls such as push carts, roadside stands, balance basket, etc. The street food entrepreneur is operating in the major economic areas with heavy population density [2].

Nevertheless, food and beverage outside home is considered the source of food borne illness [3] and is one of the problems for people all over the world [4]. Poor hygienic practice of the vendors, comprising of improper cooking, inadequate food storage temperature, and food contamination can be all sources of microbial hazard to consumers that the microbe is mostly found causing consumers food borne illness rather than other factors. *Escherichia coli*, coliforms and mesophilic bacteria have been discovered having the highest count in street food. However, the hazard can be prevented by paying attention to food preparation [5]. Food that is cooked properly is safe for consumption while the pre cooked food and the food is left for more than four hours is potential of risk. The mistake in hygiene of food preparation affects vast of consumers probably illness [6]. The percentage of patients who suffered from food borne disease in industrialized countries each year has been increased up to 30%. The Canadian government has to allocate budget amount around $3.7 billion dollars each year for 11 million cases of the illness [7].

The research group from FAO in 1995 reported that food safety is the most important aspect that should pay attention for street food in Asia [8]. Thailand has the one highest number of street vendors in Asia and many people depend on them for the meal because it is cheap and nutritious as well [9]. However, the food safety also is one of the main problems similarly like other countries [10] because the location of the food is prepared, sold or consumed is not appropriate and easily exposes to food contamination [11].

Nakhon Si Thammarat province, has the highest population in southern Thailand and [12] has past evidence that relates to unsafe street food. Many street vendors do not pass the food safety standard regulation mean while the demand of street food does not decrease respectively [13]. The decision making process of consumers when they are purchasing street food that is assumed risky becomes the central question in this study. Such information can investigate the factor that may enhance consumers concern in food safety and can contribute to the strategies that can protect consumers from unsafe food purchasing.

Decision Making Model of Blackwell known as of EMB model [14] is the basis model to develop street food purchasing model in this study. In addition, the study model is utilized to develop the research instrument to measure consumers' decision making under the apprehension of food safety.

There is a shortage of validated and reliable instrument to measure consumers' decision making in safe street food purchasing. Thus, this pilot study purposes to develop the validated and reliable instrument because there is no scholarly research work to date and attempt to design the instrument by involving all individual factors in decision after reviewing the literature thoroughly.

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II. Methodology

This pilot study aims to investigate the validity and reliability of consumers' decision making measurement instrument before applying it in the main study [15]. Moreover, the content of questionnaire was agreed by respondents in order to have clear terms and easy for respondents to understand.

TABLE I: Respondents Profile (N = 150)

Demographic Factor	Frequency	Percentage (%)
1. **Age**		
20 - 30	123	82
31 - 40	21	14
41- 50	6	4
Total	150	100
2. **Gender**		
Male	41	27.3
Female	109	72.7
Total	150	100
3. **Status**		
Single	128	85.3
Married	21	14
Widowed	1	0.7
Total	150	100
4. **Household member**		
1 person	12	8
2 persons	13	8.7
3 persons	27	18
4 persons	43	28.7
5 persons	26	17.3
6 persons	20	13.3
> 7 persons	9	6
Total	150	100
5. **Highest education**		
Secondary	58	38.7
Diploma	46	30.7
Bachelor	39	26
> Bachelor	7	4.7
Total	150	100
6. **Occupation**		
Student	87	58
Self employment	11	7.3
Private	5	3.3
State enterprise	2	1.3
Government	39	26
Housewife	5	3.3
Others	1	0.7
Total	150	100
7. **Income** (Bath)		
< 5,000	43	28.7
5,000 - 10,000	40	26.7
10,001 - 15,000	45	30
15,001 - 20,000	12	8
20,001 - 30,000	4	2.7
30,001 - 40,000	3	2
> 40,000	3	2
Total	150	100

1 US$ ≈ 30 Bath

A. Instrument Development

The variables in questionnaire were determined base on the conceptual of consumers' purchasing decision making in EMB model [14]. The items for each variable were drawn from the modification of previous literature; consumers' attitude [15], [16], consumers' motivation [17], consumers' lifestyle [18], consumers' resources , consumers' need [19], [20], consumers' pre-purchase evaluation [21], [22], consumers' purchasing [21], [22], consumers' attitude toward food safety certificate [23] together with preliminary study: observation and in-depth interview, by focusing only on food safety. The respondents were asked to address their opinion or behavior in 7 point linkert scale with 1 represented strongly disagree or never involved in that particular behavior and 7 represented strongly agree or absolutely involved in that particular behavior.

B. Sample and Data Collection

Pilot study was done at one street food center located in front of a university in NST province. Consumers who are aged between 20 – 60 years old, were a resident in NST province at least 1 year and had patronage street food no longer than 6 months were asked to participate in the study by using convenience sampling data collection technique which was the common technique in psychological research [24]. The pilot study of 150 participants and their demographic profiles are demonstrated in Table I. According to Simon [2], 10 – 20 % of total respondents in main study is reasonable to be a number of respondents in the pilot study.

C. Statistical Analysis

The returned questionnaires were tabulated using SPSS software version 20 and demographic profiles of the respondents were analyzed using descriptive analysis. Structural Equation Model analysis using AMOS software version 20 was applied to test confirmatory factor analysis (CFA) of measurement model that will reveal the validity and reliability of research the instrument [4]. The validated and reliable instrument in pilot study illustrates that the instrument will probably have no problem when employed to main study [13].

III. Result and Discussion

A. Model Fit

Analyzing 2 levels of measurement model was done with confirmatory factor analysis and the model approached good fit according to critical fit index by the yield of: relative Chi-Sq (CMIN/ DF) = 1.33 (< 5.0) [25], [26] comparative fit index (CFI) = 0.94 (> 0.9) [27], [28], Incremental Fit Index (IFI) = 0.94 (> 0.9) [26], Tucker- Lewis index (TLI) = 0.93 (> 0.9) [29], and root mean squared error of approximation (RMSEA) = 0.05 (< 0.08) [30]. Thus, this measurement model based on EMB model was fit satisfactorily with the data and could be used for street food purchasing decision explanation.

B. Construct Reliability and Convergent Validity

The measurement model with 33 items with all factors loading exceed 0.5 which are significant at $p < 0.001$, so all the items achieved the recommended value and they are valid [23] to be parameters in construct reliability (CR) and average variance extracted (AVE) calculation. The values of those both parameters are demonstrated in Table II. The construct reliability (CR) is ranging from 0.74 to 0.89 that

shows good internal consistency (0.75 - 0.90) [31] other than consumers' purchasing factor which is 0.74 however the reliability of consumers' purchasing construct is acceptable (CR > 0.7) [32]. AVE value in the last column of Table II presents convergent validity of construct. The construct are considered valid when the AVE of each construct higher than 0.5 [32]. In Table II, all constructs have AVE is ranging from 0.51 to 0.66 that are valid except consumers' purchasing (AVE = 0.42). Taking the low AVE of this construct into consideration, consumers' purchasing variable probably be decided to be dropped from structural model if in main study the variable has still been exhibited value under the recommended level [1].

C. Discriminant Validity

Discriminant validity was determined by comparing r^2 of each pair of variables as the data shown in Table III against their AVE (Table II) of those two variables, if the AVE > r^2, the discriminant validity supported. All variables in this measurement model meet the criteria of discriminant validity. Thus, this instrument confirms discriminant validity and the individual variable will not measure the same thing [24], [32].

Nonetheless, overall validated and reliable of instrument in pilot test should be taken into consideration in terms of the accuracy because of limited number of participants [33].

TABLE II: RESULT OF CONFIRMATORY FACTOR ANALYSIS OF CONSUMERS' DECISION MAKING IN SAFE STREET FOOD PURCHASING (N = 150)

Factor Codes	Items	Factor Loading	Mean (SD)	CR	AVE
Consumers' Attitude (CATT)	Improper food storage can be a health hazard.	0.55	5.98(1.28)	0.80	0.51
	Meat should be prepared well done.	0.65	6.39(1.01)		
	Negative effects of food may affect my health.	0.74	6.24(1.11)		
	We should enjoy the food, but still aware about the food safety.	0.87	6.22(.98)		
Consumers' Motivation (CMOT)	I pay attention on food safety because…			0.81	0.52
	It can help me prevent food poisoning.	0.66	6.31(.85)		
	It can force the vendors to improve their food safety practices.	0.67	6.05(1.02)		
	I am concerned with my health.	0.71	6.21(1.03)		
	It relates to my lifestyle.	0.84	5.95(1.05)		
Consumers' Lifestyle (CLIF)	I buy street foods because…			0.89	0.66
	It is not expensive.	0.81	4.61(1.65)		
	It will reduce the amount of food preparation and washing up.	0.81	4.50(1.66)		
	It allows me to have more time to relax.	0.88	4.37(1.73)		
	I really enjoy buying street food.	0.74	4.00(1.57)		
Consumers' Resources (CRES)	Price is important for me when selecting a place.	0.71	4.73(1.57)	0.80	0.51
	Street food is suitable for low income.	0.65	4.59(1.70)		
	Distance is important.	0.83	4.71(1.42)		
	Eating street food can save time for me.	0.65	4.75(1.41)		
Consumers' Need (CNEE)	The stall should provide clean utensils.	0.83	6.45(.91)	0.87	0.63
	The vendor should demonstrate personal hygiene.	0.88	6.38(1.01)		
	The food should be cooked properly.	0.70	6.46(.82)		
	No pest or domestic animal around the stall.	0.76	6.49(.83)		
Consumers' Pre Purchase Evaluation (CPRE)	I check the vendors' appearance.	0.78	5.13(1.36)	0.84	0.58
	I observe the vendors' behavior.	0.89	5.25(1.26)		
	I check if there's an undesirable smell.	0.76	5.37(1.32)		
	I concern the presentation of food.	0.57	5.87(1.13)		
Consumers' Purchasing (CPUR)	I will choose the stall with good food aroma.	0.59	5.13(1.24)	0.74	0.42
	I will not buy food from other stalls.	0.66	4.22(1.62)		
	I will not choose too crowded stalls.	0.67	4.46(1.41)		
	After receiving good information about the stall, I will go to that particular stall.	0.67	4.53(1.25)		
Consumers' Attitude Toward Food Safety Certificate (CFSC)	I believe all certified stalls carry out food safety practices.	0.78	5.26(1.29)	0.84	0.52
	I trust certified stalls use good food preparation techniques.	0.81	5.09(1.30)		
	I do not trust when it is not certified.	0.51	4.95(1.36)		
	The certificate is an assurance of food safety.	0.78	5.40(1.35)		
	The presence of the certification attracts me.	0.67	5.20(1.34)		

TABLE III: SQUARE OF CORRELATION COEFFICIENT BETWEEN TWO VARIABLES

	Square of Correlation Coefficient (r^2)							
Variable Codes	1	2	3	4	5	6	7	8
1. CATT	-							
2. CMOT	0.504	-						
3.CLIF	0.014	0	-					
4.CRES	0.003	0.001	0.168	-				
5.CNEE	0.130	0.063	0.032	0	-			
6.CPRE	0.048	0.023	0	0.001	0.044	-		
7. CPUR	0.020	0.044	0.109	0.058	0.014	0.109	-	
8.CFSC	0.005	0.003	0.084	0.006	0.001	0.005	0.116	-

IV. Conclusion

This pilot study focused on testing the validity and reliability of the instrument to avoid inappropriate questions in the main study. The measurement model was confirmed fit with data, and all factors met the criteria of reliability and validity. Even though one variable: consumers' purchasing, had AVE value a little bit less than the recommended value, the other items met the criteria, so this instrument was satisfactory to be applied in further study. This study will benefit future researchers in order to evaluate the level of validity and reliability of this instrument for measuring consumers concern regarding safe street food purchasing. Nevertheless, the nature of street food consumption varies based on the location or different demographic. Data collection from a diverse group of consumers will have a wider perspective.

V. Limitation

This study aimed to examine the reliability and validity of instrument, so the number of respondents in this study was only for trial in pilot scale and too specific for one group. The information in this study cannot be representative for the street food purchasing behavior of consumers in whole province however the confirmation about validated and reliability of decision making instrument from this pilot study can further be applied in the main study. The success in validity and reliability of instrument test in pilot study cannot warrantee it will be completely in the full scale study.

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