

DEVELOPMENT OF CONSUMER BEHAVIOR MODEL AND DECISION SUPPORT FRAMEWORK IN HEALTHY BEVERAGES FOR AN AGING SOCIETY

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Abstract

The objectives of this research were 1) to analyze factors that influence consumer behavior on healthy beverages for an aging society and 2) to develop a consumer behavior model and decision support framework on healthy beverages for an aging society. Qualitative and quantitative approaches were used to collect data. The research tools were interview questions and questionnaires. The consultants for the in-depth interview were experts in healthcare and the beverage industry. The participants who answered the questionnaires were seniors who live in city and urban areas around Thailand. The data were analyzed using structural equation modeling. The results showed that the influential factors of consumer behavior on healthy beverages were composed of personal factors and psychological factors. Personal factors have a direct influence on psychological factors with a coefficient of 0.93 at a significance level of 0.05. Psychological factors have a coefficient to consumer behavior on healthy beverages of 0.84 at a significance level of 0.05.

Keywords: Factors for consumer behavior, healthy beverages, SEM, decision support framework

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Introduction

Beverages are classified into 2 categories, alcoholic and non- alcoholic beverages in which healthy beverages are an important segment. Healthy beverages mean beverages that are claimed to be beneficial to health. Normally, being healthy is the most desirable state for everybody and makes people interested in their longevity and quality of life. Hence, healthy beverages are a prominent channel to promote a person's health.

Healthy beverages have their own target groups according to lifestyles influenced by factors such as age, demography, and gender. Thus, an overlap of each target group normally occurs because of consumer acceptance (Kengpol, 2004, 2006). Though consumer satisfaction is a dominant key for business success in a highly competitive market (Kengpol and Wangkananon, 2015), the taste and benefits of beverages are crucial factors in consumer decision-making.

According to a panel of experts at the Asia Drink Conference 2016, the Asian beverage market presents huge growth opportunities for beverage manufacturers and the future market growth would be in the area of healthier products. The health and wellness beverage category presented a growth opportunity, from US\$100 billion in 2015 to US\$150 billion in 2020, in the Asia Pacific region. Thus, the future of the beverage industry is in the area of healthy products (Food Industry Asia, 2017).

Due to the development of modern medical science, longevity and the life expectancy of people have dramatically increased and populations have been transformed into aging societies. Normally, an aging population arises from 2 demographic effects: increasing longevity and a declining fertility rate, in which increasing longevity means that the average age of the population is increased by the numbers of surviving older people and a declining fertility rate means a reduction in the birth rate (Weil, 1997). Therefore, a study of consumer behavior for an aging society is needed to understand which factors affect decision-making.

Thus, this research aims to express the factors which dominate consumer behavior based upon personal factors and psychological factors. Moreover, from a literature review, there are few decision support frameworks (DSF) of consumer behavior on healthy beverages. The research concentrates on 2 objectives, which are (1) to analyze the factors that influence consumer behavior on healthy beverages for an aging society and 2) to develop a consumer behavior model and decision support framework on healthy beverages for an aging society. The DSF can also help manufacturers to choose ways to achieve consumer satisfaction. Therefore, the contribution of this research is that healthy beverage manufacturers can exploit influential behavior factors that affect why consumers purchase and consume healthy beverages.

This paper is organized as follows. Section 2 covers a literature review for this research. Section 3 describes the research framework and methodology and section 4 presents the research result and a decision support framework. Section 5 presents conclusions and research recommendations.

Literature Review

In this section, 2 main ideas, consisting of consumer behavior and structural equation modeling, are presented.

Consumer Behavior

Kotler and Armstrong (2016) indicated that consumer behavior is influenced by cultural, social, personal, and psychological factors. Different demographics, attitudes, and buying behaviors have significantly affected different types of consumer behavior in food purchasing due to the consumers' changing perspective on health and safety (Liang and Lim, 2011). Normally, the consumer makes a decision on food products based on brand loyalty. Brand awareness and brand quality have an influence on consumer behavior and are marketing strategies for reducing risk for

consumers (Rubio *et al.*, 2014). Furthermore, the consumers’ health consciousness has an important role in their attitude towards health benefits and the quality of organic food; and their health consciousness increases as their age increases. Research has proposed that health can motivate a consumer to purchase organic foods (Grossman, 1972; Schifferstein and Ophuis, 1998) and nutrition knowledge has an influence on consumers’ decision-making (Drichoutis and Lazaridis, 2004). Generally, consumers buy food products based on their basic knowledge of nutrition. The consumers’ nutrition knowledge directly affects their decision-making, especially those consumers who are concerned about health (Grunert *et al.*, 2010). A study of adult consumers showed that knowledge about the effect of sugar-sweetened beverages is significantly associated with sugar consumption (Park *et al.*, 2013). Therefore, health education, especially on the kilocalorie content of beverages, is very beneficial.

Thus, in this research, consumer behavior is composed of buying behavior, the quality of products, and information from manufacturers;

the independent variables are personal factors (health, knowledge, and price) and psychological factors (cause to drink, attitude, and brand).

Structural Equation Modeling

Structural equation modeling (SEM) is a statistical technique used to test and estimate the relationship of statistical data and qualitative causal assumptions. SEM is an extension of several multivariate techniques: factor analysis, path analysis, and multiple regression analysis (Hair *et al.*, 2006). The strength of SEM is the ability to construct latent variables (variables which are not measured directly but are estimated in the model from several measured variables). Therefore, SEM is appropriately used to analyze consumer behavior such as the study of food safety knowledge and behavior (Lim *et al.*, 2016), brand engagement and consumer behavior towards clothing (Goldsmith *et al.*, 2012), why consumers buy functional food (Carrillo *et al.*, 2013), and factors affecting consumer behavior (Anastasiadou, 2014).

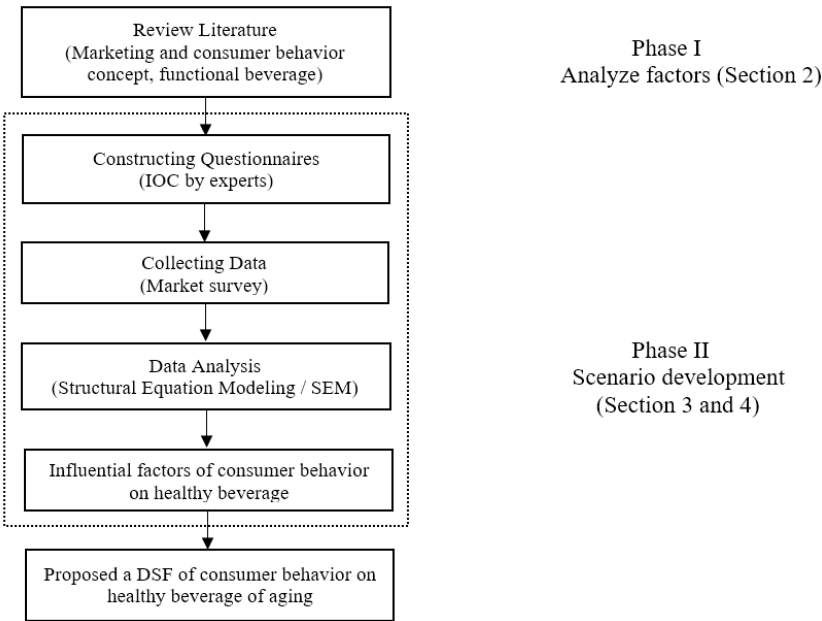


Figure 1. The research methodology for consumer behavior on healthy beverage

Research Methodology and Research Framework

Research methodology comprises 2 phases which are a literature review and a scenario development. The research process is shown in Figure 1.

Phase I: Literature Review

In the first phase, many kinds of research and theories of marketing concepts, consumer behavior concepts, and healthy beverages were studied to identify appropriate factors which affect consumer behavior on healthy beverages for an aging society.

Phase II: Scenario Development

In this phase, there are 3 steps: construction of questionnaires confirmed by experts, collection of quantitative data by market surveys from 400 samples, and then analysis of the data using a statistical analysis program which is the SEM. The research framework explores the effect of personal factors (health, knowledge, and price) and psychological factors (cause to drink, attitude, and brand) on consumer behavior in respect of healthy beverages (buying behavior, quality of products, and information from manufacturers). Meanwhile, the relevant demographics are sex, age, and family incomes.

The hypotheses can be expressed as:

- H1: Personal factors have positive effects on consumer behavior.
- H2: Personal factors have positive effects on psychological factors.
- H3: Psychological factors have positive effects on consumer behavior.

An Empirical Study

This research is designed into 2 phases: analysis of factors in phase I and scenario development in phase II. Then, after reviewing the literature, some interesting variables for the research are found in phase I. They are health, knowledge, price, cause to drink, attitude, brand, buying behavior, quality of products, and information from manufacturers. Next,

construction of the questionnaire from these variables with insights from index of consistency experts, performing a market survey, analyzing data by SEM analysis, and proposing a DSF of consumer behavior on healthy beverages for an aging society are held in the phase II scenario development. An empirical study is expressed as follows.

Sampling

Sampling is separated into groups according to gender, age, and demographics in the northern, southern, northeastern, and central parts of Thailand. A healthy beverage is selected from the list of beverages from by the community based on a consumer satisfaction survey (Kengpol *et al.*, 2016).

The questionnaire is composed of 2 sections. Section 1 is general information about the respondent that includes gender, age, demographic, status, income, and education; section 2 is on the factors that influenced consumer behavior on healthy beverages using the 5-point Likert scale. The questionnaire was examined for content validity with the index of consistency technique by experts who were inspectors of the Agricultural Research Development Agency (Public Organization) and major beverage manufacturers. After testing with a pilot group (60 subjects), the reliability test using the Cronbach alpha coefficient was accepted (0.864).

Results

Sample Characteristics

Most of the respondents were men (50.80%) aged more than 65 years old (54.20%), Buddhists (80.30%), and married (85.80%).

Reliability and Validity

The consistency of the collected data tested by the Cronbach's alpha model was 0.82 where the reliability's coefficient was accepted at 0.70 (Fornell and Larcker, 1981).

Hypotheses Testing

SEM was used to analyze the data. The criteria for the overall model fit of the SEM

were composed of the relative chi-square ($\chi^2/\text{degree of freedom}$), comparative fit index (CFI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), root mean squared residuals (RMR), and root mean square error (RMSEA) (Grunert *et al.*, 2010). The results of the model fit were: $\chi^2/\text{df} = 1.557$ (criteria <2.00), CFI = 0.993 (criteria >0.90), GFI = 0.985 (criteria >0.90), AGFI = 0.962 (criteria >0.90), RMR = 0.006 (criteria <0.05), and RMSEA = 0.037 (criteria <0.05). An adequate level of the overall model fit is shown in Table 1.

The 3 hypotheses were tested at a significance level of 0.05. The result shows that personal factors (PEF) are slightly associated with the consumer behavior (CB) meaning that H1 is not supported, whereas the PEF have a strongly positive influence on the psychological factors (PYF) meaning that H2 is supported with a significance level 0.05. Otherwise, the PYF are highly positively associated with the CB, confirming H3 with a significance level of 0.05. Furthermore, the R^2 of all the regression model analysis ranges from 0.83 to 0.86, indicating a strong explanatory power of the model (presented in Figure 2). The PYF exogenous constructs account for 86% of the total variance in the CB ($R^2 = 0.86$) and the PEF+PYF can construct a forecasting power

for 84% of the total variance in the CB ($R^2 = 0.84$).

Therefore, Figure 3 expresses the decision support framework for the CB on healthy beverages for an aging society and is composed of the PEF and PYF. The PEF have an indirect effect on the CB through the PYF with a highly strong relationship at a significance level of 0.05. Another latent variable, the PYF, has a direct effect on the CB with a highly strong relationship at a significance level of 0.05 as well.

The statistical analysis concludes that H2 and H3 are accepted at a significance level 0.05 but H1 is rejected. The detailed explanation is below:

H1: The PEF have slight effects on the CB in which the result is rejected. The PEF and CB have little relationship with no significance. This SEM expresses that the PEF have no direct effect on the CB and it implies that the PEF act as an indirect influence through the PYF. Therefore, manufacturers who aim their new products for the aging society should attract the CB by concentration more on the PYF.

Surprisingly, the PEF have no influence on the CB, especially health. Much of the literature informs that normally health is an

Table 1. Statistics for adjusted SEM

Statistic	Criteria	Value	Result
χ^2	P-value	28.033	Pass
	>0.05	($P = 0.062$)	
χ^2/df	<2.00	1.557	Pass
CFI	>0.90	0.993	Pass
GFI	>0.90	0.985	Pass
AGFI	>0.90	0.962	Pass
RMR	<0.05	0.006	Pass
RMSEA	<0.05	0.037	Pass

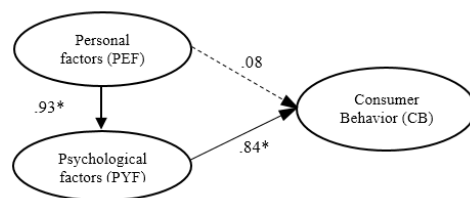


Figure 2. The SEM fit model

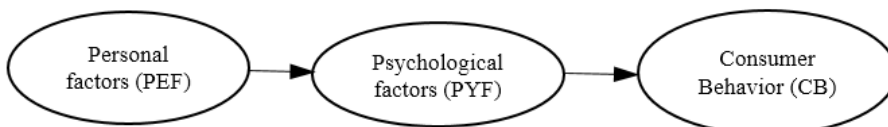


Figure 3. The DSF of consumer behavior on healthy beverage for aging society

important criterion for consumer decision-making. Further, aging market surveys by manufacturers confirm that aging consumers do not pay much attention to their health when buying a beverage. They always buy the products according to their own appreciation of the products.

H2: The PEF have positive effects on the PYF which shows a significance with a high coefficient (0.93). Thus, H2 is accepted. This implies that the PEF have a strong positive relationship with the PYF. When aging consumers realize the benefits of healthy beverages, they are willing to consume them and have a positive attitude to the products. Consequently, a reasonable price can easily encourage them to make decisions.

H3: The PYF have positive effects on the CB. The result shows a significance with a high coefficient (0.84). Thus, H3 is accepted. This implies that the PYF have a strong positive relationship with the CB. The cause to drink, attitude, and brand become influential factors for manufacturers to recognize when they launch new products. The literature addresses that attitudes and brand have significant effects on the CB in food purchasing. Generally, consumers' decision-making depends on price after being compared with brand, quality, and product benefit.

Conclusions

The objectives of this research were to investigate the influential factors of consumer behavior on healthy beverages and to propose a decision support framework of consumer behavior on healthy beverages. The value of this research is to find dominant variables of consumer behavior in a decision support framework. Personal factors have positive effects on psychological factors and a slightly positive effect on consumer behavior. Ordinarily, consumers select products and make decisions by using a combination of different sources of references such as product brand, price (Tarnanidis *et al.*, 2015), and knowledge of nutrition (Drichoutis and Lazaridis, 2004; Grunert *et al.*, 2010; Kolyesnikova *et al.*, 2009).

Though health education is essential (Park *et al.*, 2013), aging consumers still select healthy beverages depending on their attitudes and tastes.

The research contribution is in the development of a decision support framework of consumer behavior on healthy beverages to inform manufacturers to exploit the influential factors. The benefit is that manufacturers can concentrate on these factors to save time and budget when launching a new beverage.

The limitation of this research is the small sampling size of healthy beverages for an aging society because of budget limitations.

Further study should be conducted with other variables by combining different sources of references such as peer groups, marketing promotion, and consumer finance.

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