

*Full Length Research Paper*

# The influence of green consumption cognition of consumers on behavioural intention - A case study of the restaurant service industry

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Global warming and climate anomalies have caused green lifestyles and green consumption concepts to become topics of focus in recent years. In particular, how to apply these topics to the restaurant service industry has already become an important developmental trend in many countries. Restaurants account for the largest proportion of businesses in the restaurant service industry. The main purpose of this study was to apply the theory of planned behavior (TPB) to investigate the interactive influence of the green consumption cognition of consumers regarding the restaurant service industry on their consumption behavioral intentions by using structural equation modeling. A total of 620 questionnaires were distributed, and 435 valid questionnaires were returned, resulting in a valid response rate of 70.16%. The results of this study showed that the green consumption cognition, green consumption attitude, green subjective norms, and green perceived behavioral control of consumers regarding a restaurant were elements of significant positive influence. Additionally, the green consumption cognition, green consumption attitude, green subjective norms, and green perceived behavioral control of consumers with regards to a restaurant were shown to have significantly positive influence on their behavioral intention to patronize the restaurant.

**Key words:** Green consumption, behavioral intention, theory of planned behavior (TPB), restaurant service industry.

## INTRODUCTION

### Research background and problem

The global pursuit of continuing economic growth has resulted in massive impact on the earth's resources and created threats to the ecological environment, such as global warming, and air and water pollution. The environmental protection has become a topic of utmost concern for governments and citizens alike. Under the influence of this wave of green thinking, green restaurants have begun to emerge. However, many

restaurant service industry do not necessarily have a clear awareness of green consumption concepts.

Previous studies have indicated the relevance between the three variables constituting the theory of planned behavior (TPB) and behavioral intention (Balderjahn, 1988; Chan, 1999; Straughan and Robers, 1999; Han et al., 2009). Other related studies have indicated the relevance between the three variables constituting the TPB and the green consumption cognition of consumers (Fishbein, 1963; Roper, 1966; Robertson, 1971; Ajzen and Fishbein, 1977, 1980; Ajzen, 1989; Bandura, 1994, 1997; Taylor and Todd, 1995a; Feist and Feist, 1998; Pervin et al., 2005).

However, few studies have combined the interactive influence among the green consumption cognition of

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consumers, TPB, and behavioral intention applying in research of restaurant service industry. Also few studies discussed the green consumption cognitions of consumers at a restaurant service industry. Moreover, the consumers' performance of green consumption behavior at a restaurant may be influenced by internal factors (such as information, ability, emotions, and lack of awareness) and external factors (such as time, opportunity, and whether dependence on others is required). Even a past negative experience with such behavior may be an influencing factor. However, the traditional theory of reasoned action is often incapable of fully explaining behavior that is not entirely controllable through individual will. In such circumstances, TPB (Ajzen, 1985; Lee et al., 2004) must be used for further interpretation. Therefore, this study used the theory of planned behavior proposed by Ajzen (1985, 1989) as the theoretical basis for model construction.

### Research objectives

According to Alam (2011) guideline in the field of social science, the main aims of this research were as follows:

- (1) To investigate the interactive influence between the green consumption cognition of consumers as regards the restaurant service industry and their green consumption behavioral intention.
- (2) To use the three constructs of TPB (behavioral attitude, subjective norms, and perceived behavioral control) to investigate the interactive influence between elements of the restaurant service industry with regard to these three constructs and the green consumption behavioral intention of consumers.

The rest of this paper is organized as follows; literature review, green consumption cognition and also, the theory of planned behavior (TPB); relationships between green consumption cognition, TPB and behavioral intention; proposal of seven hypotheses based on the described references; introduction of the proposed framework with the overall process and detailed procedures; indication as to whether the research results support the hypotheses of this study or not; conclusion of the paper with some findings and contributions in this research to deal with the research questions.

## LITERATURE REVIEW

### Green consumption cognition

The ideological trend behind green consumption concepts originated in Europe at the end of the 1970's. The upsurge in consumer awareness gave rise to global

green consumption trends. The core concepts of green consumption can be divided into the 4R's and 3E's: Reduce, Reuse, Recycle, Refuse, Economic, Ecological, and Equitable. The goal of these seven types of green consumer actions or behavioral features is reduction of unnecessary consumption and selection of green products that pose less harm to the environment, in order to take both environmental protection and consumption into consideration (Gilg et al., 2005).

Combining the aforementioned viewpoints, this study defined green consumption cognition as the views and level of understanding of consumers with regard to restaurant incorporation of environmental protection concepts as evidenced by surroundings, facilities, and service; the obtainment and use of such information, and the internal/external factors considered by consumers prior to eating at a restaurant.

### Theory of planned behavior (TPB)

Ajzen (1985) was the first to propose the theory of planned behavior (TPB). Ajzen used the concepts of belief, attitude, intention and behavior in social psychology to attempt to create an appropriate model for interpretation and prediction of various human behaviors. Many studies on environmental behavior have also cited this theory. For example, the TPB model has been applied to waste recycling (Brown and Harris, 2001) and green consumption (Stavors et al., 1999).

The research of scholars in related fields of behavioral study (Ajzen and Fishbein, 1980; Kassem, 2003; Ajzen, 2002, 2006a, b) has provided detailed explanation of the concept of TPB. According to the viewpoint of TPB, when wishing to predict the specific behaviors of an individual, the best three predictive variables are the attitude and subjective norms of the individual towards this behavior, and the level of control that the individual perceives himself/herself to have over this behavior. Behavioral attitude can thus be viewed as a function of the beliefs of an individual with regard to the results of a behavior. Subjective norm (SN) refers to an effect exercised by influential individuals or groups on the decision of an individual as to whether to engage in specific behavior. Perceived behavioral control (PBC) refers to the individually perceived level of ease/difficulty in completing a particular behavior.

Behavioral intention (BI) reflects the willingness of an individual to engage in specific behavior, and can be determined according to whether an individual is willing to exert himself/herself in trying and how much effort he/she is willing to expend to realize a particular behavior (Fishbein and Ajzen, 1975). Kassem et al. (2003) found that consumption behavioral intention can forecast consumption behavior. A number of previous studies have shown that when an individual feels he/she is equipped with the ability or related resources/opportunities to

execute an action, his/her perceived behavioral control over the execution of this action is strengthened (Ajzen, 1985; Conner and Abraham, 2001; Francis et al., 2004; Cheng et al., 2006; Baker et al., 2007).

## RELATIONSHIPS BETWEEN GREEN CONSUMPTION COGNITION, TPB AND BEHAVIORAL INTENTION

The “cognition” of a consumer with regard to a specific subject can be defined as “the obtainment and use of knowledge”. The method of measuring cognition involves recognition and recollection (Solomon, 2008). Fishbein and Ajzen (1975) proposed that to change an individual's behavior and intentions, one must first alter his/her attitudes and subjective norms; and to alter attitudes and subjective norms, one must start from changing the beliefs that form the attitudes and subjective norms.

“Green consumption attitude”, “green subjective norms”, and “green perceived behavioral control” are internal psychological variables that directly influence green consumption behavioral intention (Lien and Chen, 2010). The external variables that influence these three internal psychological variables must be determined. These external variables indirectly influence behavioral intention through their influence on internal variables and include various factors that influence beliefs, such as beliefs and attitude concerning the object, demographic variables and personality features (Lin et al., 2000; Ajzen, 1989). Therefore, this study viewed green consumption cognition as an internal variable influencing “green consumption attitude”, “green subjective norms”, and “green perceived behavioral control”.

Green consumption attitude generally refers to outlook or viewpoint on green consumption, and the resulting positive or negative assessment of the consumer with regard to the surroundings, facilities, and services of a restaurant at which the consumer intends to engage in green consumption behavior. Fraij and Martinez (2006) found that consumers with environmental protection-oriented beliefs more actively engaged in green consumption behavior.

On the other hand, the behavioral intention model of attitude proposed by Ajzen and Fishbein (1977) can be used to explain the relationships among the cognition, behavioral attitude, and subjective norms of consumers. The behavioral intention model of attitude proposed by Ajzen and Fishbein (1977) emphasizes that the behavioral intention of consumers is influenced mainly by their behavioral attitude and subjective norms. The subjective norms of a consumer regarding green consumption behavior are influenced mainly by awareness of others' viewpoints and individual motivation to comply (Fishbein, 1963; Ajzen and Fishbein, 1977).

“Green perceived behavioral control” refers to the individually perceived level of ease/difficulty in completing an action, and is limited by the resources and opportunities of the participant. The belief of a consumer

regarding the relative ease or difficulty of engaging in green consumption behavior at a restaurant reflects the experiences of the individual in previous engagement with similar behavior. For example, elements such as recommendations from the Internet or family/friends, or use of environmentally-friendly tableware or green cleaning equipment, may influence consumers to engage in green consumption behavior at restaurants. These elements are vital in a consumer's decision whether or not to engage in green consumption behavior.

Due to the similarity between the concept of perceived behavioral control in TPB and the concept of self-efficacy, the concept of self-efficacy was developed by Bandura (1977). Bandura felt that self-efficacy is the result of the interaction between external environment, personal abilities, and achievements. The self-confidence resulting from this process determines the level of individual intrinsic motivation.

In other words, self-efficacy refers to one's belief that he/she is capable of utilizing various resources to complete specific tasks; it is also a type of individual expectation and belief in his/her ability of self-expression (Pervin et al., 2005). When the self-efficacy of an individual is combined with specific goals and demonstrated knowledge, it can become an important predictive variable of future behavior (Bandura, 1994). When consumers have higher green consumption cognition with regard to restaurants that have incorporated concepts of environmental protection, they can then more clearly perceive their own viewpoints regarding green consumption at restaurants, which produces stronger perceived behavioral control. This shows that the green consumption cognition of consumers with regard to restaurants that have incorporated concepts of environmental protection positively influences perceived behavioral control. Thus, this study inferred that the relationship between individual knowledge or skill and behavioral intention is influenced by feelings of self-efficacy.

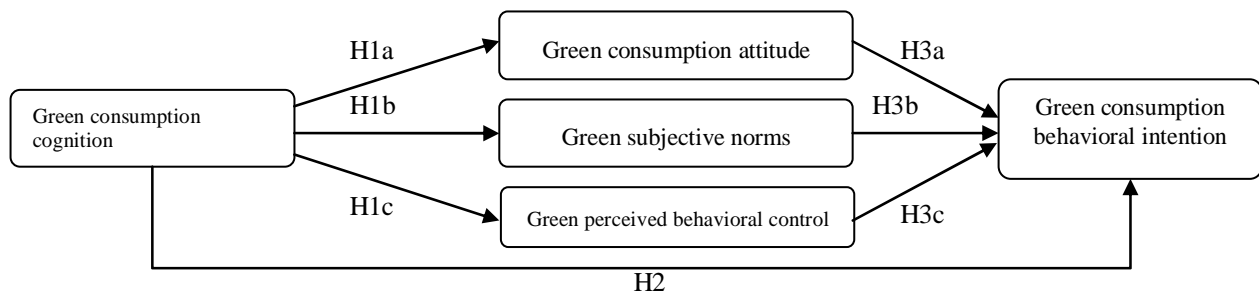
On the basis of the aforementioned references, this study inferred that green consumption cognition positively influences green consumption attitudes, green subjective norms, and green perceived behavioral control, and proposed the following hypotheses:

**H<sub>1a</sub>:** The green consumption attitude of consumers positively influences their green consumption attitude.

**H<sub>1b</sub>:** The green consumption cognition of consumers positively influences their green subjective norms.

**H<sub>1c</sub>:** The green consumption attitude of consumers positively influences their green perceived behavioral control.

Green behavioral intention refers to the likelihood or tendency of a consumer to patronize a restaurant that has incorporated concepts of environmental protection (Ajzen and Fishbein, 1980; Taylor and Todd, 1995). Previous studies have also indicated that the green



**Figure 1.** Framework of the model for the green consumption cognition and behavioral intention of consumers with regard to the restaurant service industry.

consumption cognition of consumers positively influences green consumption behavior (Vining and Ebreo, 1990; Oskamp et al., 1998). For example, if a consumer wishing to engage in green consumption at a restaurant is unable to obtain green consumption information related to the environment, facilities, and service of the restaurant beforehand, this will produce a problem of asymmetric information, which may result in a failed green consumption experience.

When consumers have stronger and more positive inclinations towards the environmentally-friendly facilities or products of a restaurant, they are more likely to engage in green consumption behavior. Thus, this study inferred that green consumption cognition positively influences the green consumption behavioral intention of consumers, and proposed the following hypothesis:

**H<sub>2</sub>:** The green consumption cognition of consumers positively influences their green consumption behavioral intentions.

In this study, green consumption behavioral intention can be measured by whether a consumer is willing to exert himself/herself in trying and how much effort he/she is willing to expend to realize green consumption behavior. Connotations of this intention include refusal to use non-environmentally friendly tableware, use of recyclable, resource-conserving, reusable products and use of other recycling systems (Fraj and Martinez, 2006).

Previous studies have indicated the relevance between the three constructs that influence TPB (green consumption attitude, green subjective norms, and green perceived behavioral control) and green consumption behavioral intention. For example: Balderjahn (1988) found that a relationship exists between the individual features of consumers and green consumption behavior, Certain previous studies have also found that a significant relationship exists among green consumption attitude, level of environmental concern, and green consumption behavioral intention (Chan, 1999; Straughan and Robers, 1999). Han et al. (2009) used the TPB framework for empirical research on the selection

decisions of consumers with regard to green hotels. The results of their research showed that behavioral attitude, subjective norms, and perceived behavioral control must definitely influence the behavioral intentions of consumers. This study proposed the following hypotheses based on the aforementioned references:

**H<sub>3a</sub>:** The green consumption attitude of consumers positively influences green consumption behavioral intention.

**H<sub>3b</sub>:** The green subjective norms of consumers positively influence green consumption behavioral intention.

**H<sub>3c</sub>:** The green perceived behavioral control of consumers positively influences green consumption behavioral intention.

## RESEARCH METHODS

### Research framework

This study used TPB and the research of Lien and Chen (2010) as the basis for application and modification of model. Moreover, as suggested by Alam (2011) this work also refers to related international and domestic researches, to investigate and examine the interactive influence of the green consumption cognition of consumers in the restaurant service industry on green consumption attitude, green subjective norms, green perceived behavioral control and green consumption behavioral intention. This study constructed its research framework based on the aforementioned hypotheses, as shown in Figure 1.

### Research targets and questionnaire design

This study targeted regular consumers to investigate the model of green consumption cognition and green consumption behavioral intention with regard to restaurants. Previous studies (Tanner et al., 2004) have shown that level of education and family income significantly influence engagement in ecological consumerism with regard to purchase of food products, and that people in higher income areas are more accepting of concepts of green consumerism or environmental protection. The Report on the Survey of Family Income and Expenditure, published by the Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Taiwan, reported that in 2007, Taipei City/County and Hsinchu City/County were the areas with the highest income per

family in Taiwan. Therefore, this study adopted consumers in the Taipei City/County area and Hsinchu City/County area who had patronized restaurants as the survey targets for this research. A total of 620 questionnaires were distributed, and 435 valid questionnaires were returned, resulting in a valid response rate of 70.16%. Due to time limitations and cost considerations, this study used convenience sampling for its questionnaire survey. This study referred to the research of Ajzen and Fishbein (1980), Vining and Ebreo (1990), Taylor and Todd (1995a), Oskamp et al. (1998), Feist and Feist (1998), Wallace (2005), Pervin et al. (2005), and Han et al. (2009) in questionnaire design.

#### Data analysis

This study used descriptive statistics, reliability and validity analysis, correlation analysis, confirmatory factor analysis, and structural equation modeling as tools in data analysis, to test the research hypotheses proposed.

### ANALYSIS RESULTS

#### Analysis of the demographic variables of respondents

Among the valid samples, a majority of consumers were female (68.7%). One reason may be that females could have been more willing to fill out questionnaires, resulting in a higher proportion of female respondents. Regarding age distribution, more consumers were concentrated in the under 20 age bracket (25.3%) and 21 to 30 age bracket (22.1%). Consumers who were university graduates (54.0%) accounted for the highest proportion with regard to level of education, followed by high school graduates (18.2%), and junior college/vocational school graduates (12.0%). With regard to living area, 54% of respondents lived in Taipei City/County and 46% in Hsinchu City/County. With regard to number of family members living together, consumers who reported four persons accounted for the highest proportion (25.1%), followed by three persons (16.1%). Average household income per month was NTD 50,001-80,000 for 29.4% of consumers, followed by NTD 30,001-50,000 for 29.0%.

#### Confirmatory factor analysis of green consumption cognition and green consumption behavioral intention

This study used CFA to test the reliability and validity of the scales of the valid questionnaires. To avoid a high degree of collinearity occurring between the variables, this study conducted correlation analysis for all variables and removed highly correlated variables (correlation coefficient >0.7) (Guieford, 1978). According to the results of CFA, this study removed items that did not reach significance and for which the absolute value of factor loading was less than 0.5 (Babin and Boles, 1998). A total of 19 variables from all of the 40 items were

removed.

Regarding the fit of the results of this study,  $\chi^2/DF = 3.16$  ( $p < 0.05$ ); SRMR = 0.17, which was not an ideal value; AGFI = 0.87, which, although not an ideal value, approached the standard value. The remaining indicators were as follows: GFI = 0.91, RMSE = 0.07, NFI = 0.90, CFI = 0.93, PNFI = 0.70, PGFI = 0.64; all these values fell within the standard range. Overall, this outcome showed that the fit of CFA in this study was acceptable.

Regarding the validity of the scales, because the design of the questionnaire in this study had a theoretical foundation and was based on empirical studies, it met the requirements for content validity. Additionally, average variance extracted (AVE) is a method of assessing the variance explanation capacity of each measured variable with regard to the latent variable. Bagozzi and Yi (1988) proposed a recommended value of AVE of 50% and up. The average variance extracted from each latent variable in the model of this research ranged from 60.22 to 72.30%, demonstrating that the latent variables of each scale exceeded the standard value of 50% and indicating that this study has good convergent validity.

Regarding the reliability of the scales, this study tested for composite reliability (CR) in the latent variables; CR refers to the combined reliability of all the measured variables and indicates the internal consistency of the dimension indicators. Higher CR indicates higher consistency among the indicators. This study used 60% as the lower boundary for CR (Fornell and Larcker, 1981). The CR value of each dimension of the scales in this study ranged from 85.47 to 91.25%, indicating that this study had good construct validity. Additionally, this study used Cronbach's  $\alpha$  to test the reliability of the questionnaire. Higher reliability indicates greater scale stability. Analysis results showed that the Cronbach's  $\alpha$  of each dimension of the scales in this questionnaire reached 0.75 or higher, demonstrating that these scales had high reliability (Guieford, 1978).

#### Structural equation modeling (SEM) analysis of green consumption cognition and green consumption behavioral intention

When the theoretical inferences and causal relationships of the research framework were completed, this study used structural evaluation modeling (SEM) based on the research framework to analyze the relationship between the green consumption cognition of consumers and behavioral intention. Measurement and verification of the model was performed according to the SEM flow (Figure 2).

Through the indicators of SEM overall model fit, this study determined the level of consistency between the actual input matrix (covariance matrix or correlation matrix) and the matrix predicted by the model; higher level of consistency would indicate the acceptability of the

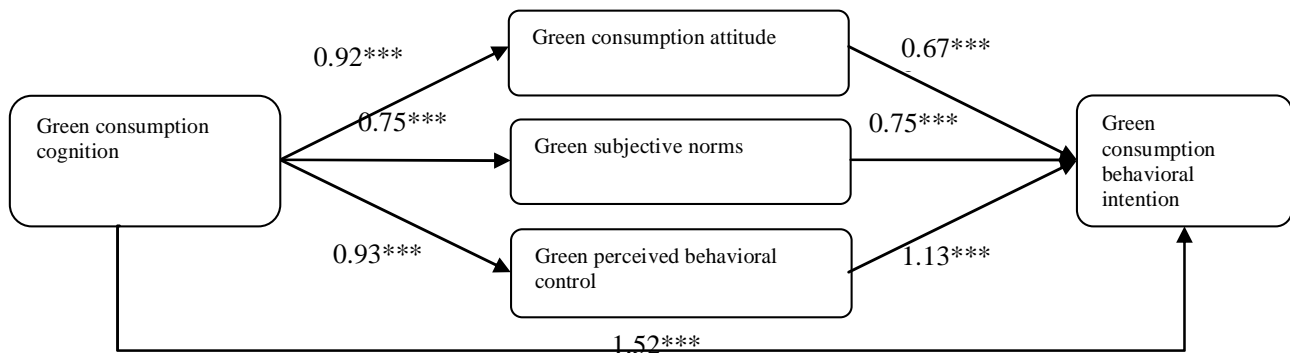


Figure 2. Structural equation modeling.

Table 1. Results of fitness indicators of SEM.

Tested model	$\chi^2/DF$	GFI	AGFI	SRMR	RMSEA	NFI	CFI	PNFI	PGFI
Model fit	2.82	0.90	0.87	0.04	0.07	0.90	0.94	0.74	0.67
Recommended value	The smaller, the better	$\geq 0.9$	$\geq 0.9$	$\leq 0.05$	$\leq 0.05$	$\geq 0.9$	$\geq 0.9$	$\geq 0.5$	$\geq 0.5$

model. With regard to the indicators of the degree of overall fit (Hair et al., 2006; Carmines and McIver, 1981; Joreskog and Sorbom, 1996; Hu and Bentler, 1999), only root mean square error of approximation (RMSEA) and AGFI did not reach the standard range, although they closely approached it. However, Babin and Boles (1998) pointed out that quality of paper evaluation by referees has no significant positive impact on the fitness of a model in terms of how well or how badly it fits. The remaining indicators all reached the standard range, indicating that the fitness indicators of SEM in this study were acceptable (Table 1).

It shows that the research results supported the hypotheses of this study:

**H<sub>1a</sub>:** A significantly positive relationship of influence was shown between the green consumption cognition and green consumption attitude of consumers with regard to the restaurant service industry. Hypothesis 1a of this study was supported.

**H<sub>1b</sub>:** A significantly positive relationship of influence was shown between the green consumption cognition and green subjective norms of consumers with regard to the restaurant service industry. Hypothesis 1b of this study was supported.

**H<sub>1c</sub>:** A significantly positive relationship of influence was shown between the green consumption cognition and green perceived behavioral control of consumers with regard to the restaurant service industry. Hypothesis 1c of this study was supported.

**H<sub>2</sub>:** A significantly positive relationship of influence was shown between the green consumption cognition and green consumption behavioral intention of consumers

with regard to the restaurant service industry. Hypothesis 2 of this study was supported.

**H<sub>3a</sub>:** A significantly positive relationship of influence was shown between the green consumption attitude and green consumption behavioral intention of consumers with regard to the restaurant service industry. Hypothesis 3a of this study was supported.

**H<sub>3b</sub>:** A significantly positive relationship of influence was shown between the green subjective norms and green consumption behavioral intention of consumers with regard to the restaurant service industry. Hypothesis 3b of this study was supported.

**H<sub>3c</sub>:** A significantly positive relationship of influence was shown between the green perceived behavioral control and green consumption behavioral intention of consumers with regard to the restaurant service industry. Hypothesis 3c of this study was supported.

Based on the aforementioned research results, this study concluded that green consumption attitude, green subjective norms, green perceived behavioral control are positively influenced by green consumption cognition of consumers. Also, green consumption behavioral intention was positively influenced by green consumption attitude, green subjective norms, and green perceived behavioral control, which was consistent with the results of previous research (Ajzen, 1988, 1991; Han et al., 2009).

## DISCUSSION

This study investigated the interactive influence between the green consumption cognition of consumers and green

consumption behavioral intention from the point of view of the restaurant service industry. A summary of the aforementioned analysis results produces the following arguments:

1) This study found that a significantly positive relationship exists between green consumption cognition and the green consumption attitude, green subjective norms, and green perceived behavioral control of consumers regarding the restaurant service industry. This outcome was consistent with those of previous studies and indicated that if consumers adopt concepts of green consumption cognition; this will increase their willingness or desire to choose to patronize a restaurant that has incorporated concepts of environmental protection. This demonstrates that the green consumption cognition of a consumer regarding a restaurant influences his/her green consumption attitude, green subjective norms, and green perceived behavioral control.

Therefore, if restaurant service vendors could enhance the provision and exchange of information for consumers, this would increase positive consumer identification with the green foods of the restaurant and increase the willingness and desire of consumers to engage in green consumption at these restaurants. Examples of such enhancement and improvements include:

- a) Use of mass media, literature, and events to increase awareness of the concepts and actions of green consumption; and
- b) Utilization of green lifestyle information websites to post information and event notifications related to green consumption.

Additionally, when a consumer fully understands the green foods offered by restaurant service vendors, this accelerates the consumption process. If a consumer has an inadequate understanding, he/she must expend more resources in searching for others' endorsement of the green foods he/she is considering. More importantly, in promotion of green restaurants, governments must incorporate the elements of green energy, noise control, green foods, waste management, and staff training into the standard management framework for such restaurants, to effectively establish selection criteria. Governments should also provide incentives for restaurant vendors to increase their willingness to comply, as well as encourage consumers to patronize such establishments and increase their knowledge and awareness of green restaurants, to stimulate the growth of a green restaurant service industry.

2) This study found that the green consumption attitudes, green subjective norms, and green perceived behavioural control of consumers had significant and positive influence on their green consumption behavioral intention with regard to patronizing of green restaurants. This outcome was consistent with those of previous related

studies. Therefore, relevant government entities should enhance consumer education in green consumption. Through sponsoring, participating in, or hosting green-themed public benefit activities, restaurant service vendors can create a positive image for themselves. This may influence consumers' attitude toward green foods and attract more green consumers to notice or purchase the foods of green establishments. Green consumption is a national movement, and green procurement of restaurant vendors is an optimal tool for putting green consumption into practice. Green procurement refers to purchasing behavior in which environmental impact plays an important role, and may involve purchasing foods manufactured from recycled materials or purchasing products that pose the least harm to the environment or human health. At the same time, governmental environmental protection and health departments should play a leading role in actively advancing key developments for green restaurants such as green policies, laws and regulations, information provision, and evaluation and assessment methods.

## Conclusions

The results of this research show that along with providing daily necessities and pursuing better quality of life, will motivate governments to advance future policies and regulations related to green restaurants. Governments will strive to move societies toward a green consumption culture of sustainable development through conceptual promotion and awareness enhancement, and thereby subtly influence consumer behavior and encourage consumer support for a green restaurant service industry.

In recent years, the topics of energy conservation and carbon reduction have received considerable emphasis, causing various industries, including the restaurant service industry, to begin to focus on related issues. This study used consumers in the restaurant service industry as research targets. Additionally, follow-up studies could investigate the differences between the green consumption cognition of consumers with regard to restaurants and their actual consumer behavior. Such information can serve as a future reference for restaurant service vendors in incorporating green consumption concepts and conducting green marketing, and relevant government entities in promoting green consumer lifestyles.

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