

# FACTORS AFFECTING THE PURCHASE INTENTION OF HOUSEHOLD WATER-SAVING PRODUCTS IN LANZHOU, CHINA

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**Abstract:** *This study aims to identify the critical factors affecting consumers' attitudes and purchase intentions with respect to household water-saving products in the city of Lanzhou, China. A total of 400 questionnaires were distributed to the respondents, people living in several selected condominiums in Lanzhou who had never bought household water-saving products before. Descriptive analysis and Pearson correlation were used for analysing the data. The findings of the study reveal that attitude, product characteristics and subjective norms can be critical predictors of purchase intention with regard to household water-saving products. The results also suggest that consumers' attitude toward purchases can be influenced by ecological affect, ecological knowledge and product familiarity.*

**Key words:** *Purchase intention, attitude, product characteristics, and ecological issues.*

## 1. Introduction

According to McCarthy and William (1984), an organization aims all its efforts at satisfying its customers. As a result, all its activities hinge upon its regular customers and also upon attracting new ones. In its effort to develop its customer base, a company will also pay particular attention to consumers at large - its potential customers. Specifically, it will look at consumers' wants, needs and purchase intentions, all of which will then become very valuable information for the company. As Armstrong et al. (2000) argued, purchase intentions are likely to provide better forecasts of future sales than a simple extrapolation from past sales trends. Thus, predicting purchase intention and identifying the critical factors affecting it is very important for a company especially in terms of new product marketing.

Berger et al. (1994) recommended that managers' efforts be focused on altering consumers' attitudes before guiding their behavioural decisions. Clearly, consumers' attitudes toward a new product or toward buying an existing product will determine to a large extent their purchase intentions and decisions. Some researchers have argued that in green marketing the degree of social pressure felt by consumers with regard to their behaviours has a direct impact on their purchase intentions (e.g. Stavros, Michael, Robert and Markos, 1999). Moreover, product characteristics as intrinsic product cues are one

of the most important factors consumers considered when evaluating a product before purchasing it (Zeithaml, 1988).

Water shortage problems have emerged as one of the most important environmental issues facing many countries in today's world, most notably India, China, a host of African nations. In China, because of the severity of the water shortage in recent years, the government has taken measures and implemented policies designed to improve the overall situation. In large cities in every province, the most efficient and relevant measure adopted by the government to solve water shortage problems has been to impose the use of water-saving products. In addition, many companies have been encouraged to introduce innovative water-saving products into the market (<http://gb.cri.cn/1321/2007/08/29/1569@1738737.htm>, 10/10/2010). Still, even though China has recently been experiencing severe water shortage problems, water-saving products have yet to be accepted by most people, who simply ignore their existence or in many cases do not even know about their existence. This lack of familiarity with these products may be due to insufficient communication with the market. This study primarily aims to investigate the latter through the exploration of the antecedent factors affecting the attitude and purchase intentions of household water-saving products.

## 2. Literature Review

*- Ecological Affect, Ecological Knowledge and Purchase Intention*

The concepts of ecological affect and ecological knowledge have been developed by

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Maloney and Ward (1973). Ecological affect refers to the level of emotional reaction of an individual toward environmental issues. Based on this definition, Maloney et al. (1975) developed some related questions and scales to measure the degree of ecological affect of consumers toward environmental issues. Further research has found that ecological affect has a positively significant relationship with behavioral intentions and actual behaviors (e.g. Ricky and Loret, 2000; Dispoto, 1997; Chan, 2001). The concept of ecological knowledge refers to the amount of knowledge an individual has about environmental issues. To measure ecological knowledge, ten questions related to environmental issues in the original construct have been developed. Similar to ecological affect, ecological knowledge has been reported to have a positively significant relationship with behavioral intention and real action (Hoch and Deighton, 1989; Park et al. 1994).

#### *- Product Familiarity, Attitude and Purchase Intention*

Familiarity is defined as a composite measure of cognitive and behavioral experience (Cheron and Hayashi, 2001). It has been reported to interact with or even directly affect attitude, preference and choice of a product or service. Alba and Hutchinson (1987) defined product familiarity as the direct and indirect experiences with the product category that have been accumulated by the consumer. Unfamiliarity with a new product leads to consumers' resistance to the product (Veryzer, 1998). The concept of product familiarity is similar to product compatibility, which has been found to directly influence attitude, subjective norm and behavioral intention in the area of innovation (Ho-Jung et al., 2004; Sara et al., 2008).

The effect of product familiarity on purchase intention has caught up the attention of researchers in the product marketing area (Heimbach et al., 1989; Park and Lessig, 1981; and Cowley and Mitchell, 2003). Some of these studies suggest that product familiarity systematically influences consumers' information processing and decision making. In the case of product category familiarity, higher product familiarity has been found to influence attitude toward purchasing this product. And product familiarity can also indirectly affect purchase intention through attitude. According to Alba and Hutchinson

(1987), buyers assess multiple product attributes and various situational cues when behavioral intentions are forming. Park and Lessig (1981) argued that the assessment of multiple product attributes and various situational cues can be influenced by a buyer's level of product category knowledge. Product familiarity was also found to have an impact on the purchase intention of new products (Lijun and Meng, 2011). It is thus assumed that higher product familiarity could bring a more positive attitude and predict higher intention to buy new and innovative products.

Attitude is defined as the evaluative effect of positive or negative feelings of individuals in performing a particular behavior (Fishbein and Ajzen, 1975). It implies a learned predisposition to respond to an object in a consistently favorable or unfavorable way. Attitude is positively and moderately correlated to environmentally responsible purchase intentions (Scott and David, 2000). There is a moderate and positive relationship between attitude and purchase intention of processed tropical fruit products (Sara et al., 2008). Suddin's et al. (2009) research on predicted intention to buy halal products, which they carried out using the TRA model, indicates that attitude has a low and positive relationship with purchase intentions. In addition, several studies examined the relationship between attitude and purchase intentions by using theories other than the TRA model. For example, Chan (2001), investigated the determinants of consumers' green purchase behaviors. The findings indicate that, as a psychological factor, attitude is positively and strongly correlated to purchase intentions. And Jen-Hung et al. (2004) found a direct relationship between attitude and purchase intention of goods on the gray market.

#### *- Subjective Norms and Purchase Intention*

The concept of subjective norms was originally developed in the TRA model to deal with the influence of the social environment or social pressure on individuals and thus on behavioral intentions (Fishbein and Ajzen, 1975). Subjective norm is an original construct in the TRA model. Many studies have applied the TRA model to predict purchase intentions, but their results are not consistent. While some have determined that there is no significant relationship between subjective norms and purchase intentions (e.g. Davis et al., 1989;

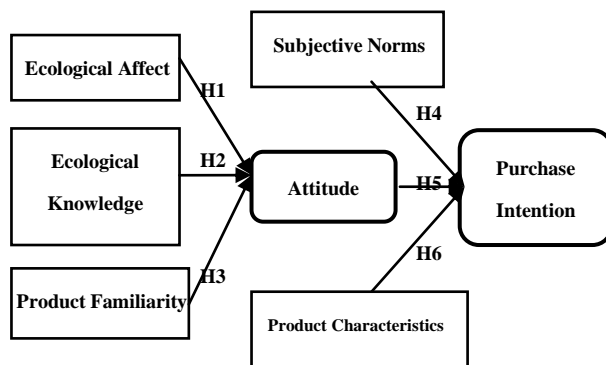
Mathieson, 1991; Chau and Hu, 2001; Lewis et al., 2003), others have shown the opposite. Ho-Jung et al. (2004), for example, found that subjective norms have a low and positively significant relationship with purchase intentions regarding new processed food products. And Suddin et al. (2009) pointed out that subjective norms have a strong influence on purchase intention.

#### - Product Characteristics and Purchase Intention

A product characteristic (PC) is a very important term in product management, but few studies have concerned themselves with this term in the product marketing area. Rogers (1983) studied the importance of product characteristic since products feature product innovation. Leo (2002) found that a product's tangibility has a significant impact on consumers' intentions toward internet shopping. They confirmed that product characteristics could be critical in predicting a particular product's purchase intention. Kyoung et al. (2008) showed that product involvement and product type all have significant relationships with purchase intentions. Gerard et al. (2010) found that country of origin of brand and product involvement all have a significant relationship with purchase intention.

### 3. Conceptual Framework

**Figure 1:** Modified Conceptual Framework



Source: created by the author for this study

Based on the conceptual framework, the following hypotheses were developed:

*H1o: There is no relationship between ecological affect and attitude toward household water-saving products.*

*H1a: There is a relationship between ecological affect and attitude toward household water-saving products.*

*H2o: There is no relationship between ecological knowledge and attitude toward household water-saving products.*

*H2a: There is a relationship between ecological knowledge and attitude toward household water-saving products.*

*H3o: There is no relationship between product familiarity and attitude toward household water-saving products.*

*H3a: There is a relationship between product familiarity and attitude toward household water-saving products.*

*H4o: There is no relationship between subjective norms and purchase intention with regard to household water-saving products.*

*H4a: There is a relationship between subjective norms and purchase intention with regard to household water-saving products.*

*H5o: There is no relationship between attitude and purchase intention with regard to household water-saving products.*

*H5a: There is a relationship between attitude and purchase intention with regard to household water-saving products.*

*H6o: There is no relationship between product characteristics and purchase intention with regard to household water-saving products.*

*H6a: There is a relationship between product characteristics and purchase intention with regard to household water-saving products.*

### 4. Research Methodology

The sample survey technique was applied. Self-administered questionnaires were distributed to gather primary data. The target population is people (age 18 or over) living in condominiums in Lanzhou who have never bought household water-saving products. To make the research more effective and reasonable, the researcher applied both the probability and non-probability sampling techniques to distribute the questionnaires. The sampling procedure includes judgment sampling, stratified random sampling and convenience sampling. A total of 400 valid

questionnaires were distributed and collected in four districts in Lanzhou.

The questionnaire is divided into nine parts and includes 40 questions in total. Except for the screening question and demographic information (Parts I and II), all the questions in Part II to Part VIII relate to each of the variable. A standard seven-point Likert scale is applied to part II to VII, ranging from 1 (strongly disagree) to 7 (strongly agree). Part VIII is about ecological knowledge and includes even questions. A single-response multiple choice scale is applied with 1.0 for a right answer and 0 point for a wrong answer. The score of ecological knowledge is  $X / 7$ , where X is summation of the correct answers scores. The possible range for the average summated mean score of ecological knowledge is between 0 and 1.

## 5. Summary and Discussion of Findings

181 respondents are between 36 and 50 year old, representing the highest percentage of the four age groups (45.2%). 220 respondents are males (55% of the total respondents). The highest portion of the respondents has a bachelor's degree, a total of 173 respondents, accounting for 43.2% of all respondents. As to the household monthly income, almost half of the respondents earn between 4,001 and 6,000 CNY.

**Table 1:** Summary of the Results of Hypotheses Testing

Hypotheses	Significance	Correlation Coefficient	Result
Hypotheses 1	0.000	.381**	Reject $H_0$
Hypotheses 2	0.000	.420**	Reject $H_0$
Hypotheses 3	0.000	.301**	Reject $H_0$
Hypotheses 4	0.000	.275**	Reject $H_0$
Hypotheses 5	0.000	.538**	Reject $H_0$
Hypotheses 6	0.000	.504**	Reject $H_0$

\*\*. Correlation is significant at the 0.01 level (2-tailed).

The mean score in respect of ecological affect shows that most of the respondents are sensitive to ecological issues. They care about water pollution and water shortage problems. Therefore, letting respondents know about

these problems and telling them that they are becoming more serious and are apt to affect their lives could be a marketing strategy to push household water-saving products.

The mean score with regard to product familiarity is the lowest one of all of the variables considered in this research. What this shows is that in spite of some experience using them, most of the respondents do not know much about household water-saving products. The same goes for water shortages and conservation even though they are concerned about them.

The researcher also found that although most of respondents have been using household water-saving products in other places before, they still are not very familiar with them and know little about them.

The mean score in respect of subjective norms indicates that most of the respondents have a neutral attitude with regard to outside pressure, especially pressure from people who are close to them. In other words, most respondents do not respond to either outside or inside pressure to buy household water-saving products.

As to attitude, the mean score attests that most respondents have a positive attitude toward purchasing water-saving products. This is a good foundation for household water-saving products' marketing as there is no outright rejection of the products or any reluctance to consider buying them. In fact, as indicated by the mean score with regard to product characteristics (the higher mean score of all of the variables), most of the respondents have a good perception and positive evaluation of household water-saving products. Clearly, the specific features of household water-saving products are accepted and approved by most respondents. In other words, they understand the relevance and benefits of these products to them in terms of financial savings as well as to society in terms of environmental benefits. It is therefore not surprising that the mean score with regard to purchase intention of household water-saving products shows that most of the respondents expressed an intention to buy household water-saving products. The intention, however, is not high. What this suggests is that a smart and appropriate strategy to market these products is important for marketers and companies to develop.

*Hypothesis 1:* The results of the Pearson correlation analysis indicate that there is a low

and positively significant relationship between ecological affect and attitude toward household water-saving products. This finding is similar to that of Ricky (2001) who found that there is a positive and significant relationship between ecological affect and attitude toward green purchasing. These results are also consistent with a number of other research studies, which determined that cognition, affect, and conation are three essential components of attitude (e.g. Bagozzi et al., 1979; Engel et al., 1990). Moreover, ecological affect is also considered a widely critical factor, directly and indirectly affecting actual purchase behavior in green marketing (Dispoto, 1997; Li, 1997; Ricky and Loret, 2000).

*Hypothesis 2:* There is a medium and positively significant relationship between ecological knowledge and attitude toward household water-saving products. Again, this finding is in keeping with that of Ricky (2001), who argued that ecological knowledge influence one's attitude toward green purchases. Ecological knowledge is a factor influencing attitude, which in turn influence purchase intention. This direct relationship between ecological knowledge and purchase intention was confirmed by a number of other studies (e.g. Horton and Turnage, 1976; Hoch and Deighton, 1989; park et al., 1994; Ricky and Loret, 2000).

*Hypothesis 3:* Product familiarity has a low and positively significant correlation with attitude toward household water-saving products. This result is supported by HoJung et al. (2004), who found that there is a low and positive relationship between product familiarity and attitude toward new food products. Product familiarity also has an impact on purchase intention. As Lijun and Meng (2011) mentioned, new products' purchase intention are apt to be affected by product familiarity. Similarly, Sara et al. (2008) found that product familiarity can influence purchase intention of processed food.

*Hypothesis 4:* Subjective norms are positively correlated to purchase intention toward household water-saving products at a low level. This finding is supported by Stavros' et al. (1999) study which considered subjective norms and purchase intention in green marketing. And as Lee (2008) pointed out, in Hong Kong, social influence has proven to be the best predictor of green purchase intention. As indicated earlier, though, the respondents in

Lanzhou are less influenced by their social environment, which therefore is less of a predictor. Environmental issues, water shortage problems and purchase behavior toward household water-saving products may also relate to some ethical issues in society. Since no regulation influenced the purchase behavior of the respondents, their purchase intention is not subject to much influenced by outside pressure and incentives.

*Hypothesis 5:* Attitude has a medium and positively significant correlation with purchase intention with regard to household water-saving products. In this study, attitude seems to be the best predictor of purchase intention. This is consistent with Scott's and David's (2000) study in which it is suggested that attitude is a critical predictor of environmentally responsible purchase intention. A similar finding from Balderjahn (1988) concluded that a positive attitude toward environmental issues will almost invariable generate an ecologically response.

*Hypothesis 6:* The product characteristics variable has a medium and positively significant relationship with regard to household water-saving products. As special attributes belonging to a specific product, product characteristics in this research are different from others such as product involvement, product type and country of origin. This finding is also supported by Stephen and Itamar (1996), who argued that some characteristics can influence the success of a new product or a brand.

## 6. Conclusion and Recommendations

As the descriptive analysis of the demographic factors shows, the majority of the respondents are males, in their late twenties and up to 50 years old who have a bachelor's degree and a middle-class household monthly income. They represent the main potential customers for household water-saving products.

As the descriptive analysis of the variables indicates, even though most respondents do not have much ecological and water conservation knowledge, they are nonetheless directly affected by ecological issues. Being the direct recipient of the problems caused by water shortages, one would think they would be eager to do something about it. Yet, most of the respondents are not very familiar with water-saving products or anything else devised

to address water shortage issues. In spite of a positive attitude toward purchasing household water-saving products, most of them did not express a high intent to buy them. In other words, they like the water-saving concept, which they endorsed, but are not ready - and willing - to disburse money for it.

Consistent with the main objective of this study, subjective norms, attitude and product characteristics are identified and confirmed as three critical factors affecting purchase intention of household water-saving products. Attitude and product characteristics are relatively important factors to predict household water-saving products' purchase intention of consumers, who have never buy household water-saving products. Their intention to buy these household products can be slightly influenced by social pressure which can operate as a personal incentive.

Attitude toward purchase household water-saving products is apt to be affected by ecological concerns, ecological knowledge and product familiarity. Of the three, ecological knowledge has a higher effect on attitude toward purchasing, which suggests that to change one's attitude toward purchasing household water-saving products, there is a need to step up marketing efforts. Specifically, much emphasis should be put on ecological information and one's role as a responsible, environment-conscious citizen.

Since the selected critical factors have been shown to have an impact on both the attitude and purchase intention of respondents toward household water-saving products, albeit in a limited way, the following recommendations can be made to (i) manufacturers, (ii) marketers and (iii) policy makers:

*- Recommendations to Manufacturers:*

As aforementioned, the significant gap in the average mean score among the product characteristics items stems from the fact that the respondents have given low evaluations to the product durability and affordability items as well as to their conformity with environmental protection standards. As a result, the researcher recommends that the quality and durability of the household water-saving products be consistent with environmental protection standards and meet reasonable consumer expectations. In short, manufacturers of household water-saving products need to improve the durability of their products and ensure a high level of quality,

which will among other, help justify the generally highest cost of these eco-friendly products.

As part of ensuring that household water-saving products are affordable, the researcher also suggests that manufacturers try to decrease their costs by using different materials or advanced facilities to improve the efficiency of their operations, so as to reduce the prices charged for household water-saving products. As reported in one Lanzhou Daily Newspaper (Lanzhou Daily, 2009), according to one marketer of household water-saving products based in Lanzhou, price is a main barrier for consumers to buy these products. Although the price of household water-saving products has decreased, many respondents still can not afford the current high prices of the household water-saving products.

Household water-saving products in the Chinese market are still in their infancy. There is no famous brand of household water-saving products in China yet. Therefore, the researcher recommends that manufacturers try to develop their own brand of household water-saving products via advertising in magazines, newspapers and on television and also by taking advantage of the brand equity they may have. They should also develop some new various styles of household water-saving products to target different groups of consumers. For instance, developing various sets of household water-saving products by using different colors or different designs to target and attract different customers at different age levels or to match different styles of interior design.

*- Recommendations to Marketers:*

Hypotheses one, two and three confirm that product familiarity, ecological affect and ecological knowledge can influence one's attitude toward purchasing household water-saving products. And as hypothesis five shows, attitude is a critical factor affecting respondents' intention to these products. Since product familiarity, ecological affect and ecological knowledge have an indirect impact on purchase intention, household water-saving-product marketers should thus develop some related marketing strategies to improve the product familiarity of household water-saving products. For instance, marketers should develop some TV advertising with an emphasis on the important characteristics of household water-saving products. They should

also conduct some promotional activities in public places such as supermarkets, shopping malls and city squares to promote their products and let customers know about the design and benefits of these products.

#### *- Recommendations to Policy Makers*

As Liu (1994) argued, the green market in China needs more support and protection from the Chinese government. Since manufacturers and marketers of household water-saving products have a limited ability to do something about people's knowledge and understanding of the ecological impact of water use, policy makers in Lanzhou should take measures to limit the effects to the environment and enhance ecological knowledge, as both can influence the purchase intention of household water-saving products. The Gansu province or the Lanzhou government should consider conducting activities to educate officers and raise their level of awareness of ecological problems, especially water shortage problems. Policy makers also should set some related education programs or organize meetings to increase the ecological among the general population.

Since as hypothesis four suggests, one's purchase intention of household water-saving products can be influenced by social and personal pressure, the government and other policy makers should conduct classes and develop activities in junior and senior schools as well as at university. In addition, they should launch an advertising campaign that includes posting advertisements in public places to let people know about water shortage problems and encourage people to buy household water-saving products as well.

Policy makers should also set some policies to support the marketers or producers of household water-saving products. For instance, they could charge lower fees for marketers to advertise on television, or in newspapers and public places, and also give them more opportunity to do promotion in public places. Finally, they could also give some financial incentives to consumers, such as, for example, giving them a tax break when buying water-saving products.

#### *- Recommendations for Further Studies*

Given the novelty of the products considered in this study, this research has some limitations in terms of data collection, investigation of critical variables and also with regard to the application of the results. On the

basis of these limitations, the following suggestions can be made:

Firstly, regarding data collection, the present study only collected questionnaires from several condominiums in four districts in Lanzhou, yet, in China, there are several other cities experiencing the same severe water usage and supply shortage problems. Therefore, further studies may consider target respondents in two or more cities so as to get more meaningful findings and provide more useful suggestions for marketers and producers of household water-saving products.

Secondly, in respect of the results of the descriptive analysis of the demographic factors, since water-saving products are not common daily life products, some respondents may not

have had a clear sense of some of the questions included in the questionnaire. Thus, this research suggests that further studies consider the target population to be potential customers; that is customers about to buy household products for their future new houses. In that case, the results will be more useful for the marketers to set some related marketing strategies.

Thirdly, further studies should identify more critical factors affecting the purchase intention of household water-saving products. For instance, perceived price could be a critical factor influencing one's purchase intention of household water-saving products due to the fact that the average price of household water-saving products is higher than that of common products. The findings from an investigation of the effect of perceived price will provide useful information about the pricing strategy marketers and producers could develop.

Finally, further studies may add some qualitative surveys to obtain useful information from people who have already bought household water-saving products. Marketers would then know more about the main reasons they choose household water-saving products and develop strategies on the basis of these people's statements.

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