



## Beliefs, Attitudes, Subjective Rules and Perceived Control about Water Saving Behavior

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### Abstract

*Water scarcity in Brazil is a reality. Residences in various parts of the country have gone through water rationing through the past years. The Theory of Planned Behavior (TPB) is formed by beliefs, attitudes, subjective norms, perceived control and behavioral intentions in relation to a specific behavior. This theory seeks to identify individuals' behavioral intentions and, consequently, predict peoples' behavior. This study aimed to identify the beliefs and attitude components, social norms and perceived control in relation to the behavior of saving water. Twenty-six interviews were supported by a questionnaire related to TPB components. The obtained results indicated the attitudes in terms of saving water are related to economic advantages, in financial terms from cheaper water bills. In addition, there is an advantage to society in the future about the water availability for human use, as well as avoiding rationing and preserving a natural resource that is becoming scarce. Regarding to saving water problems, the need to change habits and the possibility of places and belongings getting dirtier over time has been described. The social norms are current present in the family figure, friends and neighbors mainly. In the case of perceived control, changes of habits, government campaigns and even the client - among other factors - were considered as factors that help or hinder individuals trying to save water.*

**Keywords:** Consumer behavior, Theory of planned behavior, Attitudes, Water rationing, Water economy.

### 1. Introduction

Several studies are currently concerned with consumer behavior and their attempt to save water by using it more consciously. A topic with several recent researches, such as: Linkola, Andrews and

Schuetze (2013), Mondéjar-Jiménez et al. (2011), Marandu, Moeti and Joseph (2010) and Gatersleben, Steg and Vlek (2002).

The threat of rationing or restriction on water supply has already changed consumers behavior of products mainly related to toilets. Discharge valves were preferred by 95% of consumers in the past. Currently coupled boxes are preferred and valves are purchased by only 5% of consumers. Other products such as timers and economic showers have also increased consumer demand (Choucair, 2015).

Beyond that, saving water behavior and using water in a more rational way has already been used in other countries for a long time. Many of these countries are rich, but the population has learned that it is necessary to save water (Takahashi, 2015).

This studies' main goal is to identify which are the main beliefs and attitudes from the consumers' part in trying to save water. Also, to identify the people who influence this attempt to save water (social norms), as well as what factors facilitate or hinder this process, that is, the perceived control by peoples' trying to save water process. These items are part of the Theory of Planned Behavior (TPB) (Ajzen, 1985).

In managerial implications terms of this researches' results, it can be emphasized that public managers will know the beliefs and attitudes regarding the process of trying to save water, which will serve as a subsidy for the decision making process about marketing communication, facilitators creation for citizens to conserve water, programs creation and reward projects (water bill discount) and punishment (rate increase for those who behave in an adverse way), in short, managers will be able to interact and create projects and procedures to reduce water use in society.

Based on the current water scarcity scenario, knowledge about the beliefs and attitudes related to consumers' behavior becomes essential, as well as the commitment of governments (Ciminelli, 2015).

Human behavior is the focus of several researches carried out not only today but also over the last few years. Its importance is enormous, mainly by contributing to the solution of social and health problems that affect individuals, which are often caused by smoking, excessive alcohol, lack of physical activity, inadequate nutrition and by overweight (Ajzen and Manstead, 2007).

The importance and benefits of studying consumer behavior are widespread. It must be emphasized: theory strengthening of consumers' behavior, better understanding of marketing theory, and the possibility of influencing government and public policy issues (Mowen and Minor, 2001).

This studies' validity for the Consumer Behavior area is supported by the fact that it contributes to the discussion about the contribution of the theory on reality explanation - in this case, the intention to save water.

In addition, it is possible to better understand - in relation to consumers - how their possible action consequences and procedures of doing something influence their decision process. Thus, it is possible to collect a series of important information that will facilitate the understanding of choosing individuals process on the methods of trying to save water.

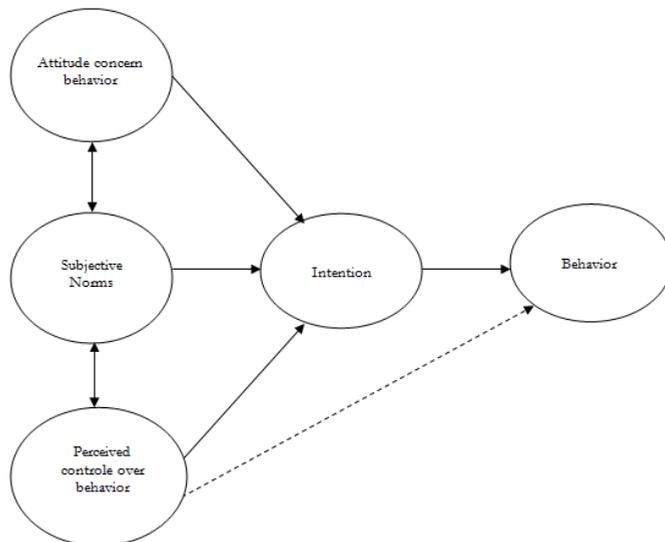
Knowing the present antecedents of peoples' decision-making process is central to the creation and effectiveness of programs with purpose to both raise and increase behavior incidence and decrease other specific behavior. It is possible to change peoples' attitudes toward a particular object or behavior through cognitive learning, emotion formation, feelings, and action. Another important point regarding to the use of TPB, concerns interventions aimed at changing the intentions and individuals behavior. This is possible because TPB provides an important and useful theoretical framework to identify behavior determinants. Therefore, it is possible to know in advance and design interventions to create the greatest possible impact on peoples' behavior change (Ajzen and Manstead, 2007).

## 2. The Theory of Planned Behavior

Intention plays an important role in TPB, which also presents the motivational factors that influence behavior. The more positive the individuals' beliefs are, the subjective norms about behavior and the persons' perception of behavior control, the greater will be the individuals' intention to act. This

is shown by the general rules. (Beck and Ajzen, 1991; Davis et al., 2002).

According to Figure 1, behavioral intention will be formed by attitudes towards behavior, influence of subjective norms and perception on the control of acting or not. Intention is the step immediately preceding the behavior. In the TPB case, the attitudes formation should consider the perception by individuals of trying both to act and to succeed as to try to act and to fail. Furthermore the effects of this attempt should be taken into consideration, whether being successful or a failure. These perceptions about the probabilities of success and failure should be reflected in beliefs about the presence of internal and external factors that may facilitate or inhibit expected outcomes or effects. In short, a person will try to act if he / she realizes that the success advantages of his / her attempt will outweigh the failure disadvantages in this attempt. TAR is a special case of TPB when the individual perceives or believes that there is no failure possibility in trying to act and that he / she has complete control over the internal and external factors that may make his attempt to behave unfeasible (Ajzen, 1985;)



**Figure 1:** The Theory of Planned Behavior

**Source:** Beck and Ajzen (1991, p.287).

Attitudes can be understood as a compound formed by cognitive items derived from individuals' beliefs and affective items, formed by peoples' emotions and feelings. Attitudes are basically characterized by peoples' willingness to respond favorably or unfavorably to an object (Fishbein and Ajzen, 1972) in a stable or permanent way over time (Haghighi, Rahrovv and Vaezi, 2012). It is a predisposition to behave in a certain way towards a particular object, whether favorably or not, through cognitive, emotional and motivational processes organization (Hawkins & Mothersbaugh, 2013). Attitudes directly influence peoples' behavior and are able to predict these behaviors (Mondéjar-Jiménez et al., 2011).

These definitions have some implications, like some attitudes - indeed, attitudes formed by beliefs - are in peoples' minds because they are predispositions that they are learned by people through information or direct experiences and they produce consistent responses (Sheth and Mittal, 2001).

The subjective norms are personal perceptions about the social pressures in relation to a certain behavior. They can be understood as the opinion of others in relation to a particular behavior that an individual considers important. The more positive the persons' attitudes toward behavior and subjective norms related to that behavior, the greater the persons' intention to act

and, consequently, the more likely it is to actually perform the behavior in question (Haghighi, Rahrov and Vaezi, 2012; Ajzen and Madden, 1986). For example, Daigle, Hrubes and Ajzens' study (2002) found that the choice of a particular leisure activity was directly related to peoples' perception of their positive or negative results. Both factors importance varies from person to person and from situation to situation. In general, both have a great influence on individuals' behavioral intention and the more important other peoples' opinion to the individual, the greater the social norms (Ajzen, 1985).

The perceived control by the individual can be conceptualized as his /her perception of his/her ability to act in a certain way and he/she was included in the TPB model with the intention of working with situations leading the individuals to notice little or no control over the behavior of interest. On the other hand, even when the individual perceives a high level of control over behavior, this new construct is also useful for predicting behavior, since perceived control can also be used in this situation as a behavior direct predictor (Haghighim, Rahrov and Vaezi, 2012; Ajzen, 2002).

Greater the individuals' perception of the factors' intensity in facilitating or inhibiting a particular behavior, greater will be the influence of the perceived control on intention and behavior prediction (Haghighi, Rahrov and Vaezi, 2012; Ajzen and Driver, 1991).

Regarding to the factors which individual perceives little or no control, it is possible to emphasize the lack of time, the lack of opportunity and the need of other people, which can change individuals behavioral intention from their attitudes (Ajzen, 1985).

Still on the subject, Beck and Ajzen (1991) point out that the formation of beliefs about perceived control comes from a source variety, such as the individuals' previous experience of behavior and the opinion and experiences of others who have already done so, this behavior and whose opinions are important for the individual, as well as other known factors such as time, resources and access that, when they change, also change the perception of control over behavior.

Although the three constructs are conceptually independent, it is important to note that they can influence and correlate with one another because they often have the same information source, especially in relation to similar behaviors already done in the past (Ajzen and Fishbein, 2005).

The importance of these three factors on individuals' behavior prediction changes depending on the behavior type and the population under study. In some situations, only attitude will have a strong influence on intentions. (Beck and Ajzen, 1991), so the conceptual diagram does not show the weights or the relative importance of each of the constructs (Ajzen and Fishbein, 2005) In a study about the willingness of black students to finish high school, the perceived control factor was the one that presented the greatest influence in the intention formation to complete or not (1998), which is the most important predictor of people behavior in weight loss, according to Schifter and Ajzen (1985). In a study of outdoor leisure activities, the perceived control construct also had a strong influence on the prediction of both intention and behavior (Ajzen and Driver, 1991).

As previously described, behavioral intention is the last phase before the individual acts or engages in behavior. In this case, the greater the behavioral intention, greater the possibility of the individual to act, and the less the possibility of the person changing his mind regarding behavior. Therefore, behavioral intention is a predictor of behavior (Armitage and Cristian, 2003; Ajzen and Madden, 1986; Ajzen, 1985).

### 3. Methodology

This is an exploratory qualitative research, whose purpose is to identify a series of factors related to consumer behavior in trying to save water.

Data were collected through interviews with people in public places. The instrument of data collection - interview script - was based on Ajzen (2006) and Moura (2010). In these studies, beliefs and attitudes, as well as influential people to the social norms and factors that impact on the perceived control by the individuals in relation to a determined behavior, were elaborated nine questions with the following topics:

- Regarding to the beliefs and attitudes towards the behavior of saving water were identified advantages, disadvantages and what are the other factors related to this behavior.

- Regarding to social norms, respondents were asked about people who would approve or disapprove their water-saving behavior. It was also asked which other people care, whether or not the respondent would try to save water.
- Factors related to perceived control were identified through questions that addressed which factors would facilitate or hinder peoples' behavior in attempting to save water. It was also asked what are the other factors related to the process of saving water being to be easy or hard.

The sampling was done for convenience, which people are invited to participate in the research because they are willing to help, because they are more accessible and not because there is no probabilistic technique to guarantee some randomness in the process of choosing the interviewees (Malhotra, 2013). Twenty-six interviews were carried out, then digitally recorded and transcribed into the analysis process, and once the obtained data saturation was perceived, the data collection process was completed.

In relation to the results analysis process, the content analysis technique was used, in which activities were carried out to identify the frequency of certain contents in the interviews with similar meanings, classifying the reports in topics to help the understanding of what exists through the correspondence narrative (Bardin, 2004). The creation of the categories obeyed the theory, in which attitudes, social norms and perceived control were separated (Ajzen; 1985, 2001; Haghghi, Rahrov and Vaezi, 2012).

#### 4. Data Analysis

The qualitative analysis, although using tables to aid in the data analysis (analysis of content based on the frequency of the interviewees' opinions), was carried out to identify regarding to trying to save water, its benefits, its problems, the people who approve or disapprove this behavior and factors that make it easier or more difficult for people to try to save water.

Regarding the benefits perceived by people in trying to save water, 44 opinions were obtained, and three items stood out. The first is the money saving by reducing the amount paid on the water bill. This advantage was described by several interviewees as "water cost reduction", "reduction of the amount to pay on the bill", among others. In addition, the issue of having water available in the future, both for the people themselves and for future generations ("to benefit ourselves", "in the future will be better, because it won't have the lack of water", "have more water", "water economy" and others) was also a very popular factor. The third most mentioned item is described as avoiding the rationing and water preservations in the reservoirs. In the first case, it is noticed an economic advantage in financial terms from water use economics. In the second case, there is an advantage for society as a whole and also for the respondent himself in the future about the water availability for human use. Lastly, avoid rationing and preserve a natural resource that begins to get scarce.

Other options are also related to the advantages to humanity in general of protection to the environment and to natural resources' care, considering also a future situation of humanity.

The next item analyzed was the disadvantages or bad effects noticed from people in trying to save water, having obtained a total of 37 opinions on this subject. It is necessary to emphasize first, a larger group of interviewees does not believe that there are any disadvantages or harmful effects on saving water in the coming months. In relation to maltreatment, items related to cleaning tasks were mentioned, whether they are about goods such as automobiles, home, clothes and etc., as well as personal hygiene like bathing, as well as the disadvantage of changing habits.

The third issue analyzed were the other opinions people have about trying to save water in the coming months. In this case, a total of 53 opinions were obtained on this behavior type, which are usually items repetition already described in the first two questions, such as: saving water in general, saving water after a bath, reusing dish water and laundry water, washing sidewalks, leaving the faucet open and the need to save water.

In terms of this issues news, it is highlighted the economy in washing the sidewalks, leaving the taps open and reusing the water.

The next item in this data analysis concerns people who would approve the attempt to save

water in the coming months, with total opinions reaching a figure of 52 items. Three groups of people was the most remembered by those who were interviewed: family, children and friends. In the first case, family is perceived as a main supporter of water economy. In the second case, children are viewed as supporters in an attempt to save money. And lastly, friends can also support individuals' initiatives in trying to save water. The other options were mostly people close to those interviewed.

Contrary to the above results, we also identified people who would disapprove of individuals' attempts to save water. 37 opinions were identified. Its noticed once again three opinions about groups of people who would disapprove the attempt to save water, which were "there are no such people", "selfish" and Copasa (Companhia de Saneamento de Minas Gerais). In the first case, it is noticed that respondents believe that all people would approve the attempt to save money. In the second case, there are those who are selfish and do not think of the common good. In the third case, Copasa would disapprove, because it would lose money to the cheaper water bills from due to people's water saving. There is also the "no-one else" group, in which people realize that there is also no one who disapproves the intention to save water.

The other options are mostly related to people who are unaware of the importance of saving water for our planets' future.

The next analyzed subject concerns people who are identified when thinking of trying to save water and have identified 46 opinions. There are four groups of people whom respondents have identified when they think about saving water.

After this analysis, the items were grouped into categories, also considering the attitude constructs, social norms and perceived control already described in the theoretical framework.

In terms of the research categories, they can be described by means of the following:

**Table 1:** The categories generated and their content generated from qualitative research

Initial category	Interediate category	Final category
Attitude	Benefits of saving water	Money saving and financial advantage
		Ensure a better future for society and preserve nature
	Disadvantages of saving water	No water rationing
		Wash things less and they can get dirtier
Social Standards	People who approve or disapprove water saving behavior	Having to change the habits to use water
		Family
		Friends
		Neighbors
Perceived Control	Factor or circumstances that allow / facilitate or make it difficult or impossible to save water	People who are important to me
		Washing less things (cars, sidewalks, etc)
		Change the way you use water in your home
		Change the way I take a shower
		Close the faucets open and never leave them open

**Source:** prepared by authors with the support of statistical software SPSS

## 5. Final Considerations

The qualitative analysis of water-saving behavior considering the advantages, disadvantages, the people who support or criticize this behavior, as well as the consumers' factors that facilitate or hinder the attempt to save water can be summarized as shows the following bullet points:

- The interviewees' general opinion, the advantages or benefits of saving water in the coming months brings the possibility of maintaining a larger water supply for the current society and future generations, a greater water volume in times of drought and cheaper water bills, in addition to preventing the water rationing for the population. Therefore, respondents feel that people should "from today", start saving water and not necessarily wait for the future. Society will be benefited by preserving this valuable asset.

- Most respondents do not notice any disadvantages or harms of saving water in the coming months. Attitudes towards water-saving behavior are quite positive. Some interviewees reported the possible lack of personal hygiene and poor sanitation of material goods such as cars, clothing and the home itself. Others see it as a disadvantage to decrease bath time and change their drinking habits. In this item, the respondents misunderstood the disadvantages, that is, the consequences, with the attitudes and actions - perceived control - about the attempt to save water, through examples such as: changing habits, reducing bath time, failing to do certain things and others. This also occurred in the previous item - benefits in saving water - but with little intensity.
- Regarding other issues related to saving water consequences in the coming months - third item in the interview script - the respondents listed several factors already described in the two previous topics, such as nature protection, water for future generations, money saving and so on. However, these same respondents described a number of factors that are not the consequences of water-saving behavior, but rather their causes - perceived control - such as: faster baths, not washing sidewalks, not washing the car with a rose, changing habits, etc.
- Respondents emphasized that people who would approve water-saving behavior in the coming months are those who understand the importance of such an economy for all current and future people, people with a higher education, and who, in addition to family members, the neighbors and neighborhood residents and the same community.
- Some respondents said that there are no groups of people or individuals who would disapprove of the intention to save water in the coming months. The other party believes that uninformed, selfish and non-conscious people would disapprove such thing and a few others pointed Copasa and companies that supply water, as not supporting this cause, due to the use decrease and consequently the value paid for them.
- In addition, several people were quoted by the interviewees when they think about saving water in the coming months. They are: co-workers, family members, friends, people connected to the environment, those affected by the financial crisis, health professionals, water companies and even the government. Other respondents answered that there are no other people they identify when they think of saving water.
- In the case of factors that would allow or facilitate water savings in the coming months, the most common response was a possible water bill discount for those who save water or increase the bill for those who do not save water, and a few have suggested the use of different faucets and different water access ways with technologies aimed at reducing the use, and also cited the cold climate as a facilitator for the economy, and all individuals living in the same household have the same saving goal. It is possible to realize that some of these factors are beyond individuals' control, such as: peoples' greater awareness, warmer or colder weather, awareness campaigns, and others.
- The factors that would make it difficult or even impossible to try to save water would be: some rooted habits in people - was the most pointed out factor- and the hot climate that would lead to greater water use. But still the vast majority of respondents did not identify factors that made water saving difficult. Again, some factors that are not controllable by individuals - climate, government, etc. - were also quoted as hindering the attempt to save water.
- Regarding the general considerations about water economy, many of them came to the interviewees' minds. Emphasis was placed on the importance of people saving water now so the future generation can enjoy this great resource, the importance of people being proactive, starting the savings at their house, without the need to wait for someone else to start, helping then other people to do it. Almost all the respondents listed simple ways to save water, such as: shorter baths, not washing sidewalks with a rose, reuse dish water to water the plants and reuse laundry water as well to clean the house and other things. An important item mentioned by the interviewed people is efficient and important that awareness campaigns are constant and not only when there is a lack of water, so habits

can really change.

About this studies theoretical contributions it is possible to describe the importance of the study object application in Brazil, because some studies have been found in the international literature, but no article on the saving water behavior in Brazil, even because, the water scarcity in water reservoirs of large Brazilian cities is a recent phenomenon. Therefore, this study offers subsidies for the questionnaire correct preparation to apply and test.

In addition, this study provides insights to the questionnaires' correct preparation to apply and test the Theory of Planned Behavior. From this researches' results, it was identified that the main beliefs related to water saving behavior are financial economy, nature conservation and added or even cancellation of a possible water rationing, but also water use economy means changes of habits and less cleaning of goods and utensils by individuals.

Compared with other studies, items related to personal washing or bathing are important in regarding to water use (Linkola, Andrews and Schuetze, 2013; Marandu, Moeti and Joseph, 2010), mainly in terms of lathering, brushing the teeth, washing clothes with full load, washing the cars less frequently and others (Mondéjar-Jiménez et al., 2011) are consistent with the results obtained.

There are several practical implications of this study, because households are large consumers of drinking water and behavioral strategies are important for reducing water use (Linkola, Andrews and Schuetze, 2013). From the obtained, public managers can create public awareness campaigns in advantage terms for the current generation and also for future generations on changing habits. In the study by Mondéjar-Jiménez et al. (2011) demonstrated that the ecological awareness level influences the way individuals consume water. Thus, guidelines are important for people to realize that small changes in behavior can lead to a large reduction in the water use of an entire population, as well as seek to create and increase individuals' environmental awareness (Marandu, Moeti and Joseph, 2010). In addition, economic factors have been also identified as important factors in terms of water use behavior and, therefore, initiatives that financially reward their change in water use through cheaper tariffs or, on the contrary, initiatives that punish those who do not change their behavior in relation to that, through higher tariffs have high chances of success. In addition, most people have a positive attitude toward water use. Distribution of small devices that help to save water - for example, devices to be placed on faucets or showers to reduce water flow - can be a good initiative from the governments, given the positive attitudes population. In short, a programs series and projects can be developed from the information collected in this research.

This researches' main limitation is related to the convenience sampling process, which prevents results generalization for the general population. As an exploratory study, the results may serve as a basis for other research or as a hypotheses construction to be tested in other studies.

In relation to future studies, this study offers enough information to prepare a questionnaire for the application of TPB to the general population consuming water. The results may serve to test and validate TPB in terms of water-saving behavior as well as a subsidy for social marketing actions. For the application of TPB, the most important is the correct measurement of beliefs and its unfolding in the constructs development of the theory (Ajzen and Fishbein, 2005), which are the results obtained in this research. In general, the more information about behavior consequences is available to individuals, they will likely form more realistic attitudes and intentions, which improves future behavior prediction (Ajzen, 2002).

From the TPB application, public managers will know the behavioral intentions of the general population in saving water terms and will also discover what are the factors - attitudes, social norms and perceived control - that most influence individuals intention in trying to save water or not. This information will support decisions to be taken by managers to increase their intention to save water, as well as to encourage people to actually act according to their intentions.

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