The Effect of Demarketing Strategies on Consumer Attitudes toward Household Water Consumption

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Abstract: Water access is a critical public policy problem that many people face worldwide. As demand for fresh water rises and supply declines, a growing number of towns will be compelled to respond to water shortages. Therefore, the purpose of this paper is to determine the effect of demarketing strategies on consumer attitudes toward household water consumption. An empirical research was conducted to test the hypotheses, using primary data collected via a survey questionnaire. A structural equation model (SEM) is used to examine the data collected from 356 users. The findings reveal that there is a relationship between independent variables (i.e. product, price, place, and promotion), and consumer attitudes toward household water consumption. Furthermore, the moderator "regulation beliefs" reinforced these relationships.

Keywords: Demarketing strategies, water, regulation beliefs, and consumer attitudes.

1 Introduction

To meet the Sustainable Development Goals (SDGs), it is critical to improve present water usage patterns, notably SDG 6 (Ensure availability and sustainable management of water and sanitation for all) [1]. Without the active engagement of household consumers, this UN target will be impossible to accomplish [2]. Consumer demand for water has been increasing not just as a result of expanding population [3,4], but also as a result of rising income and consumption in emerging nations, leading various investigations into how to meet such rising demand sustainably [5,6,7].

The fast growth in urban water needs poses a significant challenge for water supply utilities in terms of reliably supplying for the world's rising population, as water shortages are expected to become a severe global concern [8,9]. The Middle East and North Africa (MENA) area, which is home to 6.3 percent of the world's population, is the world's most water-scarce region, with only 1% of the world's accessible freshwater resources [10,11].

Palestine has among of the world's scarcest water resources, with supplies barely meeting the population's demands. The Gaza Strip (GS) in Palestine is one of these places. The Israeli government's geographical constraints on the GS have made it more impossible for the GS's more than 2 million people to obtain water, forcing them to buy it privately despite financial hardship and poor water quality [12]. In reality, much of the water purchased is frequently contaminated [13]. Total household water consumption in 2018 was 83.1 million cubic meters, falling short of the World Health Organization's (WHO) recommended minimum of 100 liters for basic family requirements such as cooking, drinking, bathing, and washing. In 2018, Israel used 2,237 million cubic meters of water. Although Israel's population is just twice that of the GS and the West Bank combined, it consumes more than five times as much water [14]. As a result, it is reasonable to expect that increasing supplies will not be able to alleviate the GS's extreme water shortage problem in the foreseeable future due to political reasons, and that it will be restrain.

According to previous research and experience, effective water-demand management strategies may enhance the supply-demand balance in water-stressed areas while also providing many advantages to all stakeholders. Reducing water consumption is a typical water-demand management strategy used to address the water problem since it is the cheapest and safest approach to protect water resources [15,16,17].

Demarketing is a little-known approach that may be used to reduce water use. Demarketing simply means preventing people from eating or purchasing certain items, either because they are hazardous or because demand exceeds supply [18]. Demarketing has been studied in the literature in light of McCarthy's four Ps of the marketing mix (product, price, place, and promotion). Demarketing tactics and initiatives to improve water conservation behaviors have only been studied in a few

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earlier research [19]. Pricing techniques (imposing costs for water usage) have been shown to encourage customers to save water in some areas [20,21]. Other research that looked at how to promote sustainable home water usage came to the conclusion that demarketing's potential should be determined in order to link awareness to behavior [22,23]. Many of the elements driving the demarketing of water use are evidently semi-consensus among academics in different countries. The current study uses Kotler and Levy's [24] technique to examine how consumers perceive and react to water demarketing activities.

This research contributes in two ways. The first contribution is to see how demarketing strategies influences consumer attitudes toward household water consumption in the GS. The second contribution of this research is to investigate the moderating effect of regulation beliefs, and their handling of the water situation. In conclusion, this study adds to the body of knowledge on demarketing, consumer behavior, water studies, and sustainability.

The resulting conceptual framework is depicted in Figure 1. This model combines the demarketing mix with the dependent variable, consumer attitudes toward household water consumption. It also shows the influence of the moderating variable on each hypothesized path from the demarketing mix elements to the dependent variable.
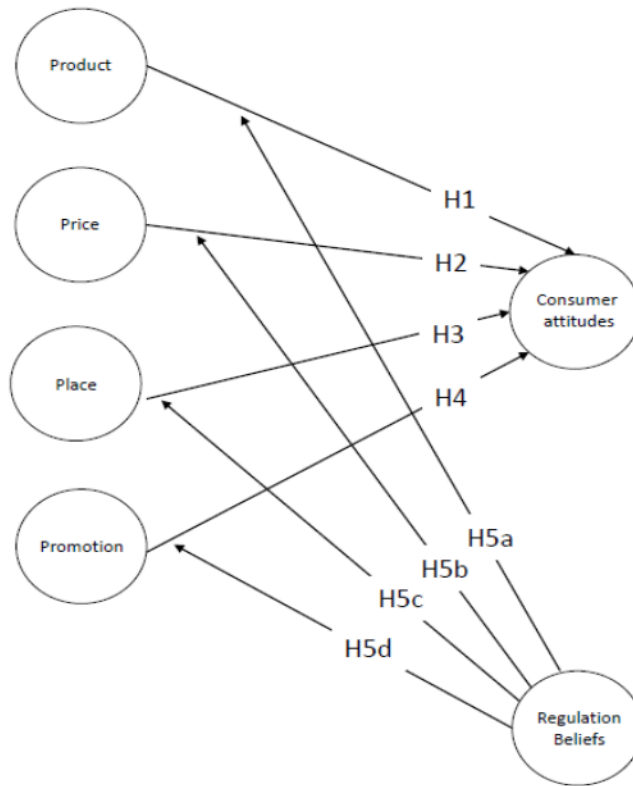

Fig. 1: The research framework.

2 Methodologies

2.1 Participants

The survey was completed and returned by 356 people in total. As shown in Table 1, Males made up 194 of the respondents, while females constituted 162. The majority of responders (268) had a bachelor's degree, and 284 were under the age of 40.

Table 1: Profile of employees' respondents

Variable	Interval	Frequency	Percentage
Age	30 years or less	131	36.8
	31-40 years	153	43.0

	41-50 years	42	11.8
	51-60 years	26	7.3
	61 years and above	4	1.1
Gender	Male	194	54.5
	Female	162	45.5
Education level	High school or lower	37	10.4
	Diploma	32	9.0
	Bachelor	268	75.3
	Master	14	3.9
	Ph.D.	5	1.4

2.2 Procedure

The study's population included all 1,899,291 people in the GS [14]. A simple random sample of 384 people was drawn from the population in the GS. Using the sample determination formula, the sample was estimated at a confidence level of 95 percent, giving the researchers a margin error of 5%. [25]. 356 out of 384 surveys were returned as complete and correct. The 356 participants provide a good representation of the GS demographics.

The descriptive approach was utilized to assess the effect of demarketing strategies on consumer attitudes toward household water consumption. As a consequence, the survey, which was performed using a Google form, served as the major data collection method for the study. The URL for the Google form was extensively shared on social media (Facebook, WhatsApp, and emails). The first question asked if the respondent was a GS resident. The participant was informed not to access the questionnaire's questions if he or she answered "No". To meet local language requirements, the original questionnaire was accurately translated into Arabic. Two native Arabic speakers were then asked to review and pilot test it for correctness.

2.3 Measures

A five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree") was used to collect all data. The four demarketing mix factors are measured as independent variables in terms of how consumers perceive them. Perceptions are important to measure since they represent the truth for customers. A four-item scale derived from Salem et al. [19] and Chaudhry et al., [26] was used to measure the product variable. A four-item scale derived from Al-Samydai and Yousif [27], and Salem [28] was used to assess price. A four-item scale derived from Medway et al. [29] was used to rate place variable. The promotion variable was measured using a four-item scale derived from Salem et al. [19], and Shiu et al. [30]. The moderating variable, regulations, was assessed using a three-item scale on consumer views about regulations modified from Maloney [31] and Beeton and Benfield [32]. The last section, "consumer attitudes toward household water consumption," adapts five elements from Sánchez-Bravo et al. [33], Harlan et al., [34], and Randolph and Troy, [35].

3 Results

3.1 Measurement model assessment

PLS-SEM model fitting was used to examine the collected data. The evaluation of structural equation models was done in two phases. Because the Cronbach alpha (used to evaluate construct reliability) values are more than (0.7) as shown in Table 2, the evaluation method in this study follows the standards given by Nunnally and Bernstein [36], indicating strong reliability. When applying another assessment criterion proposed by Henseler et al. [37] to measure convergent validity, the AVE values of all constructs are bigger than the 0.5 threshold, confirming the measuring instrument's convergence validity.

Table 2: Reliability and loading values of the constructs.

Construct	Item	Factor Loading "FL"	Composite Reliability "CR"	Cronbachs Alpha "CA"	Average Variance Extracted "AVE"
Product	Q2.1	0.846	0.852	0.771	0.764

Construct	Item	Factor Loading "FL"	Composite Reliability "CR"	Cronbachs Alpha "CA"	Average Variance Extracted "AVE"
	Q2.2	0.814			
	Q2.3	0.862			
	Q2.4	0.803			
Price	Q3.1	0.828	0.843	0.763	0.746
	Q3.2	0.804			
	Q3.3	0.837			
	Q3.4	0.805			
Place	Q4.1	0.807	0.829	0.768	0.692
	Q4.2	0.826			
	Q4.3	0.834			
	Q4.4	0.813			
Promotion	Q5.1	0.836	0.841	0.837	0.784
	Q5.2	0.809			
	Q5.3	0.853			
	Q5.4	0.833			
Regulation beliefs	Q6.1	0.822	0.846	0.827	0.753
	Q6.2	0.850			
	Q6.3	0.842			
	Q6.4	0.835			
Consumer attitudes toward household water consumption	Q8.1	0.853	0.842	0.751	0.736
	Q8.2	0.852			
	Q8.3	0.828			
	Q8.4	0.797			
	Q8.5	0.838			

The Fornell-Larker criteria was used to measure discriminant validity [38]. The criteria state that AVE should be greater than the highest squared correlation among all other constructs for each latent construct, as indicated in Table 3.

Table 3: Discriminant Validity of the Constructs.

	P1	P2	P3	P4	RB	CA	ME1	ME2	ME3	ME4
P1	0.839									
P2	0.642	0.842								
P3	0.562	0.523	0.834							
P4	0.485	0.573	0.376	0.838						
RB	0.386	0.467	0.465	0.456	0.822					
CA	0.532	0.386	0.355	0.347	0.521	0.807				
ME1	0.476	0.468	0.531	0.338	0.553	0.537	0.821			
ME2	0.620	0.451	0.419	0.571	0.671	0.452	0.558	1.000		
ME3	0.359	0.370	0.378	0.481	0.342	0.344	0.541	0.631	1.000	
ME4	0.456	0.432	0.237	0.366	0.229	0.419	0.425	0.429	0.524	1.000

Note: P1 = Product; P2 = Price; P3 = Place; P4 = Promotion; RB =Regulation beliefs; CA = Consumer attitudes toward household water consumption; ME1= Moderating Effect 1; ME2= Moderating Effect 2; ME3= Moderating Effect 3; ME4= Moderating Effect 4.

3.2 Structural model assessment

Positive relationships between consumer attitudes toward household water consumption and product (t = 2.482, p < 0.000), price (t = 2.574, p < 0.000), place (t = 3.257, p < 0.000), and promotion t = 3.852, p < 0.000) were found in the research,

supporting H1-4. We also predicted that regulation beliefs would regulate these four associations. Table 4 shows that the proposed hypotheses are somewhat supported. H5a-d indicated that customer perceptions about regulation will increase the link between product, price, place, promotion, and consumer attitudes toward household water consumption. H5b (t = 2.835, p < 0.000), H5c (t = 2.458, p < 0.000), and H5d (t = 2.187, p < 0.038) are supported by the data, while H5a (t = 1.215, n.s.) is not.

Table 4: Results of structural equation modeling.

Dependent variable : Consumer attitudes toward household water consumption		Model (1)		Model (2)	
Path model (*n*, model fit indices)		Coef.	*t*-value	Coef.	*t*-value
(1) Base model (SRMR = 0.076, d_ULS = 0.728, d_G = 0.276, NFI, 0.864)					
	P1	0.148	2.841*	0.134	2.453**
	P2	0.151	2.934**	0.142	2.482*
	P3	0.158	3.432**	0.138	2.942**
	P4	0.164	3.848***	0.164	3.078***
(2) Regulation beliefs (SRMR = 0.083, d_ULS = 1.443, d_G = 0.349, NFI, 0.859)					
	RB			0.142	3.042**
	P1 × RB			0.064	1.211
	P2 × RB			0.124	2.457*
	P3 × RB			0.138	2.672*
	P4 × RB			0.143	2.746**

Note: P1 = Product; P2 = Price; P3 = Place; P4 = Promotion; RB =Regulation beliefs; CA = Consumer attitudes toward household water consumption; ME1= Moderating Effect 1; ME2= Moderating Effect 2; ME3= Moderating Effect 3; ME4= Moderating Effect 4.
.* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Finally, the standardized root mean square residual (SRMR) and the Stone-Geisser Q2 (predictive relevance) [39] were used to evaluate the fit model in PLS. The Q2 calculation determines how well the model and its predicted parameters fit the data. A Q2 score of more than 0 shows that the data is predictive. The composite model SRMR value of independent and dependent variables was 0.075, which was lower than Hu and Bentler's [40] suggested value of 0.08, suggesting good model fit. The squared R2 value of 0.526 indicates that independent factors account for 52.6 percent of the variation in consumer attitudes toward household water consumption. The composite model SRMR value was 0.077 in the presence of the moderating variables, which is lower than Hu and Bentler's [40] recommended value of 0.08, showing that the model is well-suited. When the moderating impact of regulation beliefs is taken into account, the modified R2 value of 0.578 shows that the independent factors account for 57.8 percent of the variation in consumer attitudes toward household water consumption.

4 Discussions

4.1 Discussion of findings

Demarketing strategies were used to see whether consumer attitudes toward household water consumption might be affected. The research also examines how successful regulation is in influencing consumer attitudes toward household water consumption. The results reveal a positive association between the independent factors (product, price, place, and promotion) and the dependent variable (consumer attitudes toward household water consumption). The findings show that promotions, place, price, and product all raise consumer attitudes toward household water consumption. Suppose that customers are given more equal options, such as preventing illegal connections, and equitable distribution across geographies. In this scenario, place is the most important factor in demarketing. Second, pricing changes based on use (i.e., paying more [less] when more [less] water is utilized), and third, public awareness campaigns on the need to minimize waste and use. The product is a less effective technique for managing water use. However, we have discovered that dissatisfaction with water supply leads to deconsumption.

However, we expected that, contrary to previous research, regulation beliefs would modify these four main connections. In other words, whereas regulation beliefs modify the link between consumer attitudes toward household water consumption and three of the demarketing mix factors (price, place, and promotion), they do not moderate the association between product and consumer attitudes toward household water consumption. The findings suggest that more regulation may not be an

effective strategy to directly lower consumer attitudes toward household water consumption. Instead, if consumers are provided dynamic pricing depending on their consumption levels, have access to a more efficient/equitable network, and are exposed to water usage reduction promotional activities, they are more inclined to reduce their use.

It is intuitive that place and product have a consistent favorable influence on demarketing under higher regulation beliefs to decrease water usage. However, a more thorough examination of these connections reveals some positive aspects. Price, place, and promotion reconfigurations that favor deconsumption appear to contribute to realistic deconsumption intents. In practice, this causes providers to alter their price, supply chains, and communication tactics without necessarily changing the substance of their products. These findings should urge policymakers to enact legislation that supports initiatives in order to have a greater influence on consumer attitudes toward household water consumption. This analysis not only confirms prior research that pricing modulations lead to demarketing [41], but it also uncovers two new factors: place and promotion. Furthermore, customers' reactions to government rules can improve the efficiency of demarketing.

Overall, the outcomes of the study support White and Thomas [42]'s assumption that price and place impact consumer attitudes toward household water consumption. We also discovered that consumer attitudes toward household water consumption are influenced by promotion and product. However, increasing legislation supporting demarketing does not greatly boost the product effect. As a result, without the help of policymakers, supplier product modifications might affect consumer attitudes toward household water consumption. Regulations, on the other hand, boost the influence of the other three aspects of the demarketing mix, namely price, place, and promotion.

In contrast to previous smoking studies, which focused solely on product, price, and place (e.g., White and Thomas, [42]), we show that promotion plays an important role in demarketing. Promotion, on the other hand, is least favorably reinforced by supportive regulation, whereas price and location are most strongly reinforced. Price modulation appears to be the demarketing component that interacts the most strongly with surrounding legislation, implying that price modulation (such as dynamic pricing, for example) will contribute to water deconsumption more effectively under stronger regulation.

4.2 Limitations and Future Research Directions

The study is restricted in scope to the GS, and its findings cannot be applied to all of Palestine, including the West Bank. Demarketing variables might be assessed in future studies to rationalize water in both Palestinian areas.

Further research on factors impacting demarketing of water usage for each sector (residential, industrial, agricultural, etc.) independently would be beneficial. This type of research could aid in the development of sector-based deconsumption strategies. There are also cultural distinctions between Palestinians and western communities. Future study might look at using culturally relevant criteria as a moderator on the link between demarketing and consumer attitudes.

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