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## Article

# Exploring Bottled Water Purchase Intention via Trust in Advertising, Product Knowledge, Consumer Beliefs and Theory of Reasoned Action

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**Abstract:** As the bottled water market is projected to grow continuously worldwide, so is the plastic waste that pollutes the environment. The beverage industry's marketing campaigns have played an important role in sustaining the popularity of bottled water. Social science theory-based empirical research examining how consumers make bottled water consumption decisions remains limited. To help fill this literature gap, the current study tested a conceptual framework to explore the influence of trust in bottled water advertising and perceived product knowledge on consumer beliefs about bottled water, in conjunction with theory of reasoned action. The study surveyed a sample of college students in the U.S. (N = 445). Findings showed that greater trust in bottled water advertising as well as more false knowledge and less factual knowledge were significantly related to consumer beliefs about bottled water's product content and image. Furthermore, more favorable cognitive beliefs, affective beliefs, attitude and perceived subjective norms toward bottled water consumption were positively related to purchase intention. To reduce bottled water purchase among young adults, it would be beneficial to utilize marketing strategies to popularize and normalize carrying a reusable water bottle as an environmentally friendly habit and a preferred lifestyle choice.

**Keywords:** trust in advertising; affective beliefs; bottled water consumption; cognitive beliefs; product knowledge; theory of reasoned action



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## 1. Introduction

Over the past decade, the bottled water market has witnessed an annual growth rate of 5% each year (Johnson 2019). Consumption of bottled water surpassed the per capita consumption of carbonated soft drinks in 2016, for the first time in the U.S. (Maloney 2017). In 2019, per capita consumption of bottled water reached roughly 43.7 gallons in the United States; by comparison, only about 10% of Americans reported that they drank tap or filtered water exclusively in 2018 (Conway 2020). The global bottled water market size is expected to reach USD 505.19 billion by 2028 (PR Newswire 2021). Although the recent COVID pandemic has left homebound consumers buying fewer bottles of water, leaving the bottled water industry with a slight decline in revenues, the U.S. is still the largest bottled-water-consuming country in the world (Abboud and Evans 2020).

As bottled water is packaged in polyethylene terephthalate (PET) bottles, the discarded bottles are a constant source of environmental pollution. Research has shown that harmful toxic chemicals such as antimony can leach from these PET bottles to poison the earth and sea (Alabi et al. 2019; Shotyky et al. 2006). Recycling rate of PET and jars was 29.1% in the U.S. in 2019 (United States Environmental Protection Agency 2021). While caps and lids from PET bottles are among the top three common types of ocean debris (Chung 2020), only 8.4% of the plastic waste was recycled in the U.S. and the rest was left behind as landfills in

2017 (Peçanha 2020). Of the recycled bottles, a very small percentage are used to make new bottles. For example, Coca Cola and Nestlé Waters North America produced only 7% and 6% of their plastic from recycled material, respectively (TAPP Water 2018).

According to a large national study using a stratified random sample of U.S. adults, younger adults were more likely to drink bottled water than their older counterparts (Hu et al. 2011). Another study examining the data collected for the National Health and Nutrition Examination Survey (in three waves during 2011–2016) found that American adults aged 30–50 consumed more bottled water than those aged 19–30; these results, however, were not adjusted through sample weighting, as the sample size for the former was 1.56 times larger than the latter (Vieux et al. 2020).

As for college student studies, a 2016 national study of Generation Z college students (those born after 1996) showed that 42% of them planned to drink more bottled water and 22% only drank bottled water (Buzalka 2016). Based on this study, the top reasons for purchasing bottled water included: “all-natural,” “low-calorie,” “organic,” “vitamin-enhanced” and “zero-calorie.” Similar findings were demonstrated in a follow-up 2018 national study, which indicated that bottled water remained the most favorite beverage among Gen Z college students, as nearly 44% of them reported drinking seven or more servings each week (Sudano 2018).

Even so, a national poll conducted by Pew Research 2020 showed that 77% of the American young adults (ages 18–29) considered environmental protection to be a top national priority. A subsequent Pew Research study also reported that more Gen Zers considered climate change a top personal concern than any other cohorts (Tyson et al. 2021). These polling results appeared to reflect the public’s sentiment associated with perceived safety of drinking water in the U.S. Specifically, a Gallup poll indicated that more Americans expressed a “great deal” of concern with pollution of drinking water (63%) and water ways (i.e., rivers, lakes and reservoirs) (57%) than all other environmental concerns (McCarthy 2017). The same study also reported that 80% of non-Whites and 75% of low-income Americans were worried about drinking-water pollution, compared to 56% Whites and 56% higher-income individuals.

Extant literature on bottled water research primarily contains work that studied topics related to environmental research, science education, natural resource management and similar areas. Social scientific theory-based empirical research addressing bottled water use behavior remains limited (Jovarauskaitė et al. 2020). The current study aims to help fill this theoretical and empirical gap by integrating a set of antecedent cognitive and affective factors with theory of reasoned action (TRA) to explain bottled water consumption intention. Similar to the approach adopted in previous research that applied the TRA framework (e.g., Bagozzi et al. 1992; Fitzmaurice 2005; Langdridge et al. 2007), this study measured antecedent variables relevant to bottled water marketing and consumption in conjunction with the TRA constructs in the context of consumer decision-making. Specifically, this study aims to investigate two major theoretical questions regarding bottled water perceptions and purchase decision-making: (1) how trust in advertising and bottled water knowledge influence cognitive and affective beliefs toward bottled water; and (2) how consumer knowledge and beliefs impact their attitude and perceived social norms to explain their purchase intention.

### 1.1. Literature Review

For consumers, advertising is a major source of product information about bottled water (hereafter, BW). For example, Fiji water promotes its brand with social media hashtags such as #EarthsFinest; its television commercials feature statements—such as “Untouched by man. It’s earth’s finest water”—accompanied with images of innocent-looking children in a serene tropical location. However, as pointed out by Jones et al. (2017), “FIJI Water is not from a source surrounded by a tropical rainforest or the sort of coastal or floral environments evident on their packaging...FIJI Water’s glamorous packaging bears little resemblance to the environmental reality that at its source point” (pp. 119–20).

### 1.2. Trust in BW Advertising

Trust in advertising is a concept that extends beyond being a dimension of the perceived credibility construct, as it includes additional components such as perceived benevolence and willingness to rely on others (e.g., [Doney and Cannon 1997](#); [McAllister 1995](#)). As suggested by [Soh et al. \(2009\)](#), “The willingness to act on advertising is considered a more appropriate indicator of trust in advertising than actual trusting behavior” (p. 86). The general concept of trust in advertising or advertising trust is usually conceptualized as “accuracy” or integrity of advertising, as delineated from falsehood in advertising, and has been commonly evaluated with a single-item measure (e.g., [Menon et al. 2002](#); [Obermiller and Spangenberg 1998](#); [Soh et al. 2009](#)). As a primary function of advertising is to enable consumers to evaluate brand/product information to help them make a consumption choice (e.g., [Nelson 1974](#)), lacking alternative information sources can lead to reliance on advertising information to make that choice.

[Martin \(2003\)](#) reported that advertising was the most common source for learning about BW’s quality and production process among college students, followed by friends/family, classes/lectures, and scientific literature. [Islam and Habib \(2009\)](#) suggested that brand advertising was an important aspect influencing intention to purchase BW products. [Etale et al. \(2018\)](#) contended that advertising messages, which typically depict BW as a product synonymous with youthfulness, energy, trendiness and social status, could result in higher consumption intention. [Prasetiawan et al.’s \(2017\)](#) study conducted in the Indonesian market suggested that substantial marketing efforts highlighting BW’s appeal via desired good quality, convenience and health benefits had resulted in high trust in BW as a product. Similarly, BW information learning and brand familiarity due to repeated exposure to advertising messages can help build consumer trust in a product, which can translate into purchase intention and behavior ([Ha and Perks 2005](#)).

In 2019, BW advertising expenditure ranked third in total beverage advertising, trailing behind beer and carbonated soft drinks ([International Bottled Water Association n.d.](#)). While the primary information source for learning about a BW brand/product for college students is advertising, research has found that college students lack factual knowledge about the content of BW and its environmental impact ([Saylor et al. 2011](#)). Other research has also shown that college students’ knowledge about drinking water was low ([Johnson and Courter 2020](#)). This lack of factual knowledge is not surprising, as bottled water advertising campaigns have helped create and shape misapprehension and false knowledge about BW products among consumers ([Klein and Huang 2008](#); [Wilk 2006](#)).

For example, Nestlé’s Poland Spring advertising campaigns have falsely claimed that ice mountain water is the only source of their product, instead of filtered tap or well water ([Macias 2018](#); [Prevos 2013](#); [Stempel 2019](#)). Even though Nestlé’s false advertising claim (e.g., “Filtered through the 10,000-year-old glacial aquifers of Maine, Poland Spring has natural electrolytes for a crisp and refreshing taste”) has been subjected to repeated legal challenges, the company was still ranked 29th in the top 100 most reputable companies in 2021—along with two other largest BW producers—the 58th-ranked Coca Cola and 20th-ranked Pepsi Corp ([The 2021 Axios Harris Poll 100 2021](#)). In essence, the marketing machine of these large beverage companies has been able to establish strong brand trust among consumers.

Based on the empirical evidence discussed above, it is reasonable to speculate that greater trust in BW advertising could be related to false knowledge about BW product (e.g., purity and health benefits) and the opposite could also be true for factual knowledge (e.g., negative environmental impact) about BW. To empirically test the potential connection between trust in BW advertising and BW knowledge, two research questions are posed below.

RQ1a-b: Will trust in BW adverts be (a) positively related to false BW knowledge, and (b) negatively related to factual BW knowledge?

### 1.3. Consumer Beliefs

To examine consumer beliefs about BW, the current study conceptualizes this construct via two different dimensions: cognitive vs. affective dimensions. The theoretical relevance of each of these conceptual dimensions is discussed below.

**Cognitive Beliefs.** Cognitive beliefs refer to individuals' evaluative responses about an attitude object based on their beliefs (Manstead and Parker 1995; van der Pligt et al. 1997). Advertisers constantly promote BW (an "attitude object") as a product with "pure," "healthy" and "protected" quality (usually with images of beautiful mountains and springs) against tap water's "inconsistent" and "unpredictable" quality (Ferrier 2001; Prevos 2013; Whitman 2016). Numerous advertising campaigns have helped create the beliefs that BW contains health benefits that tap water does not (Hu et al. 2011; Johnstone and Serret 2011; Ward et al. 2009). Past studies have also revealed that college students consumed a lot of bottled water because they perceived bottled water as providing additional health benefits relative to tap water, even though they could not name those benefits when questioned (e.g., Ward et al. 2009). As such, advertising has shaped consumer perceptions or cognitive beliefs of BW quality, in terms of its greater purity, cleanliness, taste and even nutritional values, when compared to tap water (Geerts et al. 2020; Ballantine et al. 2019; Klein and Huang 2008; Wilk 2006).

**Affective Beliefs.** Affective beliefs reflect individuals' evaluative responses, based on emotional and affective reactions engendered by an attitude object (Ballantine et al. 2019; Manstead and Parker 1995; van der Pligt et al. 1997). Major BW marketers often depict their BW products (an "attitude object") as a status symbol or desirable consumer identity, coupled with innovative packaging design such as bottle shape and labeling (Islam and Habib 2009). Etale et al. (2018) argued that bottled water advertising messages promoting an image of youthfulness, energy, trendiness and social status have been successful in eliciting positive affective responses and stimulating consumption intention. Biro's (2019) study of a restaurant's water menu (made available at a dining establishment), is an example of the social status prescribed by different branded water to its patrons. Similarly, Brewis et al.'s (2021) reported that when consumers in a large U.S. city were asked to consider and rank different models of water consumption, Fiji-brand water emerged as the most prestigious type of drinking water across the "bottled water lover" model, "technology positive" (nanotechnology- and RO-treated water) model, and the "elitist anti-tap" model.

As little empirical research on the association between trust in BW advertising and consumer beliefs is available, two research questions are proposed to ascertain their relationship.

RQ2a-b: Will trust in advertising be positively related to (a) cognitive beliefs and (b) affective beliefs about BW consumption?

### 1.4. Consumer Knowledge

Consumer knowledge refers to a consumer's broad familiarity resulting from their accumulated consumption experiences, while product knowledge (a subset of consumer knowledge) reflects the actual or perceived sum of product class information and rules stored in their memory (Philippe and Ngobo 1999). As the current study assumes that trust in BW advertising could help formulate either factually accurate or inaccurate consumer/product knowledge, such knowledge is also expected to have an impact on consumer beliefs about BW consumption.

For example, factual knowledge about bottled water was found by Martin (2003) to be negatively related to bottled water consumption frequency among college students; the same was true for factual knowledge about the safety and quality of tap water. Foote (2011), however, failed to find a similar relationship and suggested that factual knowledge had little effects on BW consumption decisions instead. Xu and Lin's (2018) study of college students yielded mixed results and confirmed only selected findings from these prior

studies, suggesting that BW knowledge was negatively related to tap water consumption but irrelevant to BW consumption.

On the other hand, Saylor et al.'s (2011) study demonstrated that college students who preferred tap water were aware that most bottled water is not necessarily drawn from a "natural" or "more pure" water source, when compared to tap water; students also recognized that water source disclosure is missing on product labels and that plastic bottles can cause environmental pollution. van der Linden's (2013) study tested environmental messages with a college student sample and found that knowing the facts about the bottled water product itself—including the water supply source and manufacturing process—could potentially discourage students' BW consumption behavior.

Empirical evidence on the effects of false or factual knowledge on consumer beliefs is largely lacking. Insufficient empirical evidence notwithstanding, it would be logical to assume that more factual knowledge about BW could negatively influence rational cognitive beliefs (e.g., function-based) about BW consumption, but more false knowledge about BW could positively influence affective beliefs (e.g., image-based). To verify these assumptions, the following two research questions will be tested.

RQ3a-b: Will (a) factual knowledge be negatively related to cognitive beliefs about BW, and (b) false knowledge be positively related to affective beliefs about BW?

### 1.5. Consumer Beliefs and Theory of Reason Action

According to Theory of Reasoned Action (Ajzen 1985, 1991), intention to perform a behavior is a function of both attitude and subjective norms associated with that behavior; behavioral intention could further lead to actual behavior. While attitude is shaped by the beliefs and affective evaluation of behavioral outcomes, subjective norm reflects the normative beliefs of expectations from important others. Past research has applied theory of reasoned action (TRA) to study pro-environmental behaviors—such as global climate change (Kim et al. 2013), water conservation (Trumbo and O'Keefe 2005; Untaru et al. 2016) and green consumerism (Coleman et al. 2011)—but not bottled water consumption behavior. The ensuing discussion will review TRA in relation to BW consumption decision-making process.

As discussed above, advertising campaigns could influence consumer trust, knowledge and beliefs about water BW consumption. By extension, consumers' cognitive and affective beliefs, built on trust and knowledge about BW, could then potentially influence their attitude toward the product. For instance, Cote and Wolfe's (2018) content analysis study suggested that BW adverts and pro-BW campaigns associate the product with positive emotional appeals to (1) support consumers' self-esteem, (2) provide them with opportunities to engage in worldview defense through misleading environmental responsibility and local-community supportiveness messages, and (3) symbolically extend the consumers' perceived lifespan (i.e., quality and pure water leads to longevity).

These findings are consistent with past studies, which reported that advertising could shape consumer perceptions of BW quality, including cleanliness, taste, nutritional values, health benefits and safety (e.g., Klein and Huang 2008; Ward et al. 2009; Jovarauskaitė et al. 2020). This type of cognitive beliefs could then influence consumer attitude and purchase intention toward BW products. By the same token, consumer beliefs about bottled water brands could be shaped by their evaluation of affect-targeted appeals that convey a BW brand's image, status symbol, packaging design and pricing through advertising (Islam and Habib 2009). This type of affective beliefs could also have an influence on consumer attitude toward BW, which could lead to BW purchase intention.

As aforementioned, misleading information permeated through advertising messages about BW as a high-quality and safe choice preferred by consumers has helped create positive cognitive beliefs about BW consumption (Klein and Huang 2008; Ward et al. 2009; Jovarauskaitė et al. 2020). Advertising campaigns have also been found to lead a majority of consumers to believe BW's superiority over tap water (e.g., Hu et al. 2011). Marketing messages have pitched BW consumption as a social status-conferral purchase to project a

prestigious, cool and fun consumer image/identity to help shape positive affective beliefs about BW consumption (Cote and Wolfe 2018; Etale et al. 2018; Islam and Habib 2009). In essence, BW advertising portrays a lifestyle image or identity that the consumers may wish to project about themselves; this image or identity presents BW as a product that communicates youthfulness, energy, trendiness and social status (Etale et al. 2018).

Hawkins (2017) argued that mass marketing in the 1990s promoted a “hydration support” norm, which encouraged consumers to drink as much water as possible for better health, via purchasing and carrying BW around all the time. He further advanced an observation which encapsulated how the influence of BW marketing campaigns on consumer beliefs—via the superiority of BW over tap water—had helped shape BW consumption norm as follows: “Bottles are normalizing new modes of water governance that foreground the tensions between water as an individualized market good and water as a collective service.” (p. 2). Combining these respectively favorable cognitive and affective beliefs about BW as a healthy product and a preferred lifestyle-product choice, it is reasonable to assume that these consumer beliefs could also help contribute to the perception that BW consumption is an acceptable, supported and/or desirable social norm.

Few (if any) studies have examined how consumer beliefs might have contributed to their attitudes and perceived social norms toward BW consumption. Nonetheless, the extant literature has validated how cognitive and affective beliefs could impact the consumption of sustainable goods. For example, Polish consumers reported that they would not purchase a “green” clothing product, if the clothing item did not provide enough aesthetic benefits to satisfy their aspirations (Rahman and Koszewska 2020). Another study that compared Canadian and Indian consumers also reported that consumers were more interested in psychic/aesthetic (e.g., style and color) and physical/functional (e.g., comfort and durability) cues than extrinsic and sustainable (e.g., price, brand name and eco-ethical labels) cues (Rahman et al. 2021).

Based on the prior work discussed above that connects consumer beliefs and TRA, the following hypotheses are postulated to validate whether consumers’ cognitive and affective beliefs about BW will be related to their attitude, perceived social norms and purchase intentions associated BW consumption.

**Hypothesis 1a–c (H1a–c).** *Cognitive beliefs will be positively related to (a) attitude and (b) perceived subjective norms, and (c) purchase intention associated with BW consumption.*

**Hypothesis 2a–c (H2a–c).** *Affective beliefs will be positively related to (a) attitude, (b) perceived subjective norms, and (c) purchase intention associated with BW consumption.*

#### 1.6. BW Attitudes, Consumption Norms and Purchase Intention

Meta-analyses on environmental behavior (Bamberg and Möser 2007; Klöckner 2013; Morren and Grinstein 2016) indicated a relatively stable and positive relationship between attitude and behavioral intention ( $r_z = 0.60 - 0.66$ ) across various types of environmentally friendly behaviors (e.g., recycling, water conservation, energy saving, and sustainable consumption). Existing research testing the TRA theory via the influence of attitude and perceived norms on BW consumption intention and behavior is scarce, however.

Of the limited empirical research that tested consumer attitudes, Levallois et al. (1999) reported that negative attitude toward tap water quality was a determinant for selecting BW as an alternative to tap water. Islam and Habib (2009) maintained that attitude toward the brand’s status symbol, attractive packaging design and brand advertising are important affective factors that influenced intention to purchase BW products. Qian’s (2018) study of college students across Hong Kong, Macau and Singapore similarly reported that positive attitude toward BW products was related to more frequent purchase behavior. To confirm the relations between BW attitude and purchase intent herein, the following hypothesis is posited.

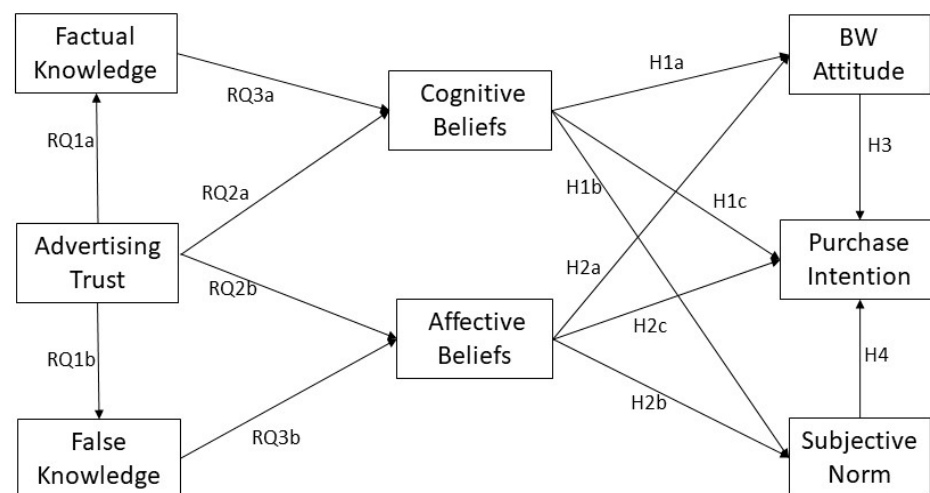
**Hypothesis 3 (H3).** *Attitude toward BW consumption will be positively related to BW purchase intention.*

Of the few available studies that referenced social influence, [Martin's \(2003\)](#) work demonstrated that peer pressure was a factor that could play a role in increasing BW consumption. Likewise, perceived subjective norms were found to predict increased green products purchasing ([Al-Swidi et al. 2014](#)), household waste recycling ([Ari and Veysel Yilmaz 2016](#); [Ahmad et al. 2016](#)) and household water consumption ([Jorgensen et al. 2009](#)). [van der Linden \(2013\)](#) revealed that Dutch college students exposed to a campaign message of BW's negative environmental impact and decreased BW consumption among their peers reported lower BW purchase intention. Another U.S. college student study also revealed that perceived positive subjective norms toward BW consumption contributed to BW purchase intention ([Xu and Lin 2018](#)). Moreover, a positive correlation between BW consumption and perceived subjective norms was found across three sub-dimensions—personal habits, family habits and environmental concerns—among college students from three different East Asian regions ([Qian 2018](#)). To further verify whether perceived subjective norms on BW consumption may influence purchase intention, the following hypothesis is proposed.

**Hypothesis 4 (H4).** *Perceived subjective norms toward BW consumption will be positively related to BW purchase intention.*

### 1.7. Proposed Conceptual Model

A conceptual model is proposed below to integrate the hypotheses and research questions stated above (see [Figure 1](#)). The model illustrates that trust in BW advertising is related to BW knowledge (factual vs. false) and the latter is associated with cognitive and affective beliefs. It also demonstrates how cognitive and affective beliefs are connected to attitude and perceived subjective norms toward BW consumption and purchase intention.



**Figure 1.** Proposed Advertising and Knowledge Conceptual Model.

## 2. Material and Methods

### 2.1. Study Sample and Procedure

An online survey was conducted with a sample of college students recruited from an introductory-level general education course at a large northeastern university, with prior IRB approval. Extra course credit was offered to those students who participated in the study. As BW marketing typically targets the young adult population ([Hu et al. 2011](#)), college students who have begun to make consumption decisions independently as emerging adults are a suited population for studying BW consumption behavior. College students



were also chosen for this study because they reportedly consumed 7.7 single-use bottles of water (500 mL bottle) on average per week (Saylor et al. 2011).

Students who wished to participate in the study were invited to first log onto the study webpage to review the informed consent form. After expressing their consent, they responded to the survey questions measuring the variables tested in the H's and RQ's stated above, along with a set of demographic questions. The study sample yielded 445 valid cases, after removing the cases that had incomplete answers. Average age of the sample was 19.2 (SD = 1.3), 48% of which were males. The racial/ethnic breakdown of the sample is as follows: Caucasians (68.9%), African Americans (7%), Hispanics (7.2%), Asians (12.8%), Pacific Islanders (0.5%), Native Americans (0.2%), two or more races (2.3%) and other (1.1%). In terms of the BW consumption behavior of study participants, 39% of them reported drinking at least 5 bottles and 27% indicated consuming at least 7 bottles each week. With regard to drinking-water preference, 47% of them expressed a preference of bottled water over other types of water, 9.3% favored tap water instead, and 43% had no preference.

## 2.2. Measures

All study measures are presented in Appendix A. Trust in BW adverts was assessed by a single item on a seven-point scale (ranging from 1 = "don't trust all" to 7 = "totally trust"), following the measurement approach validated in the literature (e.g., Menon et al. 2002; Obermiller and Spangenberg 1998; Soh et al. 2009). Participants were instructed to consider how much they trust the information originated from BW product advertisements (e.g., Dasani, Poland Spring, Evian, and Fiji). Cognitive Beliefs were measured with five items adapted from previous research (e.g., Doria et al. 2009; Islam and Habib 2009; Ward et al. 2009) to indicate consumers' evaluation of BW product source and quality, on a seven-point scale (ranging from 1 = "strongly disagree" to 7 = "strongly agree"). Sample items include describing bottled water as follows: "It tastes good," "It is clean," and "It contains ingredients good for health." These items were combined to form a composite variable (Alpha = 0.86). Affective beliefs were reflected with three items adapted from previous research (e.g., Doria et al. 2009; Islam and Habib 2009; Ward et al. 2009) to describe how the product makes the consumer feel, on a seven-point scale (ranging from 1 = "strongly disagree" to 7 = "strongly agree"). These items include the following: "It looks cool to carry a store-bought bottled water around," "I like the shape/design of the store-bought bottle," and "I like the reputation of bottled water brands/companies." A composite variable merging these three items has an Alpha value of 0.85.

Seven items were developed to describe false knowledge, including six original items and one adapted item ("Bottled water is originated from spring water in nature.") based on Foote's (2011) measures of "environmental knowledge of bottled and tap water." Another seven items were constructed to illustrate factual knowledge, including six items adopted from Foote (2011) and one original item ("Three of five single-use water bottles are recycled in U.S."). Participants evaluated each item with a true/false response. A false knowledge index was created to sum up the number of inaccurate statements that participant considered to be true. Examples of these items include: "Bottled water is originated from spring water in nature," "Most people prefer bottled water over tap water," and "Single-use bottled water is different from tap water." A factual knowledge index was also generated to total up the number of accurate statements that were correctly identified. Examples of these items include "The cost of getting an annual supply of bottled water is about 100 times more than that for the same amount of tap water," "Producing disposable plastic water bottles requires the use of millions of barrels of oil," and "Over half of bottled water sold in the U.S. is tap water."

Subjective norms were gauged with four original items constructed to assess perceived norms of BW consumption approved by one's social circle on a seven-point scale (ranging from 1 = "strongly disagree" to 7 = "strongly agree"). Participants evaluated the following perceived norms from their social circle associated with single-use bottled water:

(1) approval of frequent consumption, (2) discouragement from purchasing (reverse coded), (3) support of their preference, and (4) displeasure with their spending (reverse coded). These items were then merged to construct the composite variable (Alpha = 0.91).

Attitude was indicated with five original items on a seven-point scale (ranging from 1 = “strongly disagree” to 7 = “strongly agree”). Sample items include whether consuming single-use bottle water (1) suits my lifestyle, and (2) makes me feel good about myself. These five items were averaged to create a composite variable (Alpha = 0.90). Purchase Intention was evaluated with ten original items that indicate ten different locations/scenarios for consuming bottled water, measured on the same seven-point scale (1 = “strongly disagree” to 7 = “strongly agree”). Sample items include reporting the intention to purchase bottled water when participants “exercise in the gym,” “attend outdoor events,” and “stop at a convenient store.” These items were averaged to form a composite variable (Alpha = 0.92).

### 3. Results

A structural equation modeling (SEM) analysis was used to test the research hypothesis and questions. The measurement model statistics showed that the model fit was acceptable,  $\chi^2 = 683.94$ , CMIN/DF = 2.28,  $p < 0.001$ ; CFI = 0.95, IFI = 0.95; RMSEA = 0.05. All factor loadings were above 0.63. Based on these results, exploratory factor analysis was conducted to confirm the factor structure of each composite variable and its reliability (as reported in the measures section above). Table 1 presents both descriptive and correlation statistics. All variables were significantly correlated. Correlation between BW attitude and purchase intention was at 0.68; the confirmatory factor analysis established that there was no multicollinearity concern.

**Table 1.** Correlations and Descriptive Statistics.

	1	2	3	4	5	6	7	8
1 Trust in Advertising								
2 False Knowledge	0.40 **							
3 Factual Knowledge	−0.24 **	−0.42 **						
4 Cognitive Beliefs	0.42 **	0.38 **	−0.25 **					
5 Affective Beliefs	0.29 **	0.24 **	−0.18 **	0.35 **				
6 Attitude toward BW	0.37 **	0.31 **	−0.26 **	0.46 **	0.38 **			
7 Subjective Norm	0.32 **	0.23 **	−0.27 **	0.35 **	0.21 **	0.33 **		
8 Purchase Intention	0.36 **	0.29 **	−0.30 **	0.49 **	0.37 **	0.68 **	0.44 **	
<i>M(SD)</i>	4.03 (1.45)	3.90 (1.31)	4.58 (1.45)	4.90 (1.20)	2.87 (1.42)	3.59 (1.34)	4.49 (1.25)	3.95 (1.39)

\*\*  $p < 0.01$ .

A path analysis was utilized to test the proposed research questions and hypotheses (see Figure 2). The modeling statistics suggested that the model was a good fit,  $\chi^2 = 10.71$ , DF = 6, CMIN/DF = 1.79,  $p = 0.10$ ; CFI = 0.995, IFI = 0.995, NFI = 0.99; RMSEA = 0.04, but one proposed path was not statistically significant: between “affective beliefs” and “subjective norms.” After removing this non-significant path, a revised model also demonstrated a good model fit,  $\chi^2 = 12.29$ , DF = 7, CMIN/DF = 1.76,  $p = 0.09$ ; CFI = 0.99, IFI = 0.99, NFI = 0.99; RMSEA = 0.04. The overall equation explained 53% of the total variance in intention toward BW consumption.

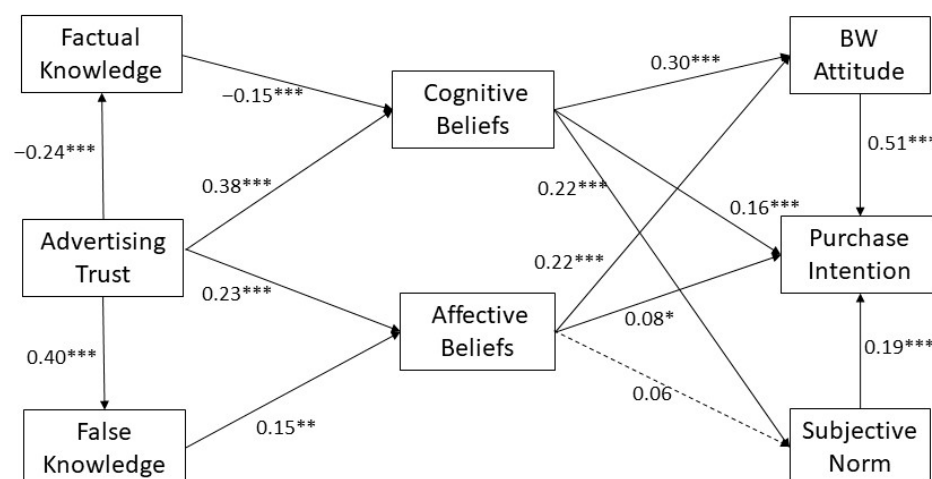


Figure 2. Path Model Results. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

RQ1a–b query whether trust in BW advertising is associated with factual and false BW knowledge. Results showed that trust in advertising was a negative predictor of factual knowledge ( $B = -0.24$ ,  $p < 0.001$ ) and a positive predictor of false knowledge ( $B = 0.40$ ,  $p < 0.001$ ), as anticipated. Per the query of RQ2a–b, the study tested whether trust in BW advertising is positively related to cognitive belief and affective belief about BW consumption. As expected, trust in advertising was found to be a positive predictor of both cognitive beliefs ( $B = 0.38$ ,  $p < 0.001$ ) and affective beliefs ( $B = 0.23$ ,  $p < 0.001$ ). RQ3a asks whether false knowledge is positively related to affective beliefs about BW consumption. Findings indicated that false knowledge was a positive predictor of affective belief ( $B = 0.15$ ,  $p = 0.002$ ). By contrast, RQ3b aims to attest the potential negative relationship between factual knowledge and cognitive beliefs about BW consumption. Factual knowledge emerged as a significant and negative predictor of cognitive beliefs ( $B = -0.15$ ,  $p < 0.001$ ).

H1a–c propose that stronger cognitive beliefs about BW benefits will be related to more favorable attitude and subjective norm, as well as greater purchase intention toward BW. Results revealed that cognitive beliefs positively predicted attitude ( $B = 0.30$ ,  $p < 0.001$ ), subjective norm ( $B = 0.22$ ,  $p < 0.001$ ), and purchase intention ( $B = 0.16$ ,  $p < 0.001$ ), validating H1a–c. H2a–c presume that stronger affective beliefs about BW benefits will be related to more favorable attitude and subjective norm, as well as greater purchase intention toward BW. Findings showed that affective beliefs was a positive predictor of attitude ( $B = 0.22$ ,  $p < 0.001$ ) and purchase intention ( $B = 0.08$ ,  $p = 0.02$ ), but not subjective norms ( $B = 0.06$ ,  $p = 0.21$ ). Hence, while H1a and H1c were supported, H1b was not.

H3 states that attitude toward BW will be positively related to purchase intention. As attitude was found to be a positive predictor of purchase intention ( $B = 0.51$ ,  $p < 0.001$ ), this hypothesis was supported. H4 asserts that there will be a positive relationship between perceived subjective norm and purchase intention. This positive relationship was validated ( $B = 0.19$ ,  $p < 0.001$ ), providing support for H4.

#### 4. Discussion

The current study makes an important theoretical contribution to the literature, as it is among the first to provide a conceptual framework that identifies and validates a set of theoretical constructs to help explain how young adults make BW purchase decisions. Study results have advanced our theoretical understanding of how trust in BW advertising is related to consumer knowledge and beliefs about BW product attributes—as well as how such beliefs along with consumer attitudes and perceived norms—could help explain BW purchase intention. Specifically, the proposed conceptual framework integrated relevant cognitive, affective and behavioral measures with the constructs of TRA. The structural model which tested the conceptual model accounted for 53% of the variance in BW purchase intention.

The current study theorized and validated the role of trust in BW adverts in influencing consumer knowledge and beliefs about BW products. This conceptual approach is different from what was commonly adopted in the extant literature, which typically measured advertising exposure frequency to explain how consumers might acquire product perceptions/beliefs (e.g., Klein and Huang 2008; Wilk 2006). As suggested by the findings, trust in BW adverts was also relevant to both rational and emotional thoughts about BW products. In particular, those who trusted BW adverts more also held a stronger level of cognitive beliefs about BW's functional quality (e.g., purity, cleanliness, health and/or safety) and affective beliefs about BW's symbolic value (e.g., fun, cool, prestigious and/or social status).

These findings hence provided preliminary evidence to validate our assumption that trust in BW advertising could influence how consumers think and feel about BW products. Not surprisingly, BW marketers relentlessly reinforce the beliefs that BW is superior to tap water and represents a desired lifestyle choice. Such marketing efforts appears to have been relatively effective, as two of the top reasons for purchasing BW products among college students were "all-natural" and "organic" (Buzalka 2016). Likewise, social symbol was found to be related to consumer preference of BW as their drinking water (e.g., Etale et al. 2018; Islam and Habib 2009). Furthermore, the current study revealed that perceived trust in BW advertising was a positive predictor of false BW knowledge and a negative indicator of factual BW knowledge. This suggests that when consumers trust the BW advertising content more, they could also have more misapprehensions about BW products, and vice versa.

The relationship between consumer knowledge and beliefs showed us that BW knowledge contributed to explain cognitive and affective beliefs about BW consumptions. Interestingly, while factual knowledge was negatively related to consumers' cognitive beliefs, false knowledge was positively related to their affective beliefs. Hence, the more factual knowledge that consumers possessed, the more strongly that they disagreed with the functional attributes promoted in BW advertising. On the other hand, when consumers had more false knowledge, they more strongly embraced the symbolic meanings asserted in BW advertising.

The significance of affective beliefs evidenced here is consistent with the work of Brio and Brewis et al. (2021), which demonstrated how BW's symbolism is related to consumer beliefs about BW preference and consumption. From a physiological perspective, a study that utilized electrophysiological responses to examine purchase tendency for hedonic and utilitarian products (Chen et al. 2019) found that those with a low social status had a strong tendency to prefer hedonistic products associated with symbolic status meaning. By comparison, those with a high social status did not show any preference between these two types of products.

In terms of perceived social norms, as cognitive beliefs were found to be positively related to perceived subjective norms of BW consumption, the same was not true for affective beliefs. These results suggest that while more positive beliefs about BW's functional value are associated with more favorable perception of BW consumption norms in one's inner circle, more positive beliefs about BW's symbolic value are irrelevant to such social norm perception. It is possible that consumers who hold a stronger belief about BW's status-conferral-related claims may not wish to associate such seemingly "superfluous" beliefs with social approval. These findings thus help signify the need for shifting the social norms away from habitual BW consumption to drinking water from a reusable water bottle. Specifically, past work has found the combined message of social norming and environmental conservation aiming to reduce BW drinking intentions among college students was effective in an experimental study setting (van der Linden 2013). Likewise, a study that utilized an approach of institutional "norm-signaling" of a "prototypical behavior"—carrying drinking water in a university-issued reusable water bottle—also appeared to contribute to a decrease of BW purchase frequencies among college students (Santos and van der Linden 2017).

As hypothesized, cognitive beliefs about BW's quality-related attributes were shown to be positively related to purchase intention. This finding verified prior study results, which demonstrated favorable perceptions about the quality and health benefits of BW leading to purchase intention (Johnstone and Serret 2011; Klein and Huang 2008; Wilk 2006). Affective beliefs about BW's product image and symbolism were also positively related to purchase intention. Again, this finding also confirmed past research that reported how positive affective response toward image-laden BW advertising messages—highlighting youthfulness, fun and high-quality hydration choice as a status symbol—had helped facilitate purchase intentions (Cote and Wolfe 2018; Etale et al. 2018; Islam and Habib 2009). The importance of cognitive and affective beliefs as validated here also echoes the findings reported by a systematic literature review of creative media advertising effects (Eelen et al. 2016). This study suggested that when mediated by positive feeling and thoughts toward the brand, advertising can generate positive attitudes toward, word-of-mouth about and sales of a brand. By comparison, as advertising was found to strengthen positive brand associations over time, it was either a non-significant or negative factor in recall of product information (e.g., the factual knowledge in the current study context).

Turning to the TRA constructs, attitude was a positive and significant predictor of BW purchase intention, in line with the finding from previous studies (e.g., Bamberg and Möser 2007; Klöckner 2013; Morren and Grinstein 2016). With regard to perceived subjective social norms of BW consumption, this variable was also positively and significantly related to purchase intention. This finding thus validates past research that addressed the relations between subjective norms and different types of environmental behavior (Ahmad et al. 2016; Al-Swidi et al. 2014; Ari and Veysel Yilmaz 2016). The combined findings which support consumer attitude and peer influence to be positive correlates to BW purchase intention are consistent with the assumption of TRA, which is a widely utilized theoretical model for explaining consumer behavior in the environmental conservation context.

## 5. Conclusions

The current study explores a set of theoretical factors—including knowledge, beliefs, attitudes, social norms and trust in BW advertising—to help explain young adults' bottled water purchase decision-making process. Consumers who trusted BW advertising more generally demonstrated more false knowledge about BW products and exhibited stronger beliefs about BW's health benefits and symbolic image—along with more favorable attitude and perceived social norms toward BW use—as well as a greater level of purchase intention. As companies invested heavily in advertising campaigns to make the claim that their BW product is of better quality and more desirable than tap water (Whitman 2016), they could cultivate consumer trust in their advertising narrative and hence trust in their brand over time.

By nature, consumers are creatures of habit (Bamberg et al. 2003) and will not stop purchasing the same product until a change in their perception and/or attitude toward that product is sufficient to alter their beliefs and behavior. The recent trend of “accessorizing” with a stylish reusable water bottles as a status symbol among millennials and the 20-somethings is an example of how consumers could be motivated to purchase a “conspicuously sustainability-conscious” product (Mull 2019). Previous research has already shown that status consciousness among consumers could encourage green product purchase when shopping in a public setting, especially when the green products are costlier than the non-green products under consideration (Griskevicius et al. 2010). Since 51.8% of the Generation-Z college students surveyed in a national study indicated that they drank filtered water and nearly all of them agreed that BW packaging negatively impact the environment (Sudano 2018), it would be useful to disseminate social marketing campaigns that normalize carrying filtered water in a reusable water bottle as a “cool” and popular trend among younger consumers.

Several study limitations should be noted here. First, study participants were mostly white college students (68.9%). Ideally, a more diverse and multiracial young adult sample

could be studied in the future to increase generalization of the current findings. Second, lacking established scales or indices that measure factual vs. false knowledge in the literature, the study adopted an existing index (with preliminary empirical validation) to measure false knowledge and developed original items to assess factual knowledge. Even though these knowledge items, when tested in research questions and hypotheses, confirmed our theoretical assumptions, the clarity of these measurement items could be improved. Third, the study did not evaluate perceived descriptive norms and only measured perceived subjective norms (a TRA construct). Descriptive norms could be an important factor for examining consumption pattern among college students, as demonstrated in meta-analysis studies that assessed their alcohol use behavior (e.g., [Armitage and Conner 2001](#); [Rivis and Sheeran 2003](#)).

As environmental attitude and awareness are major factors that can reduce consumer demand of BW and should be promoted through pro-environmental campaigns (e.g., [van der Linden 2013](#)), more scholarly research is needed to help formulate effective social marketing strategies that could reduce the purchase of bottled water. Future research could validate the current study findings with a more diverse emerging adult population. Additional studies could also test consumer trust in advertising strategies that promote reusable water bottles (and filtered tap water) as an alternative to purchasing bottled water. It would also be beneficial for future studies to explore the effectiveness of consumer trust in advertising messages in combination with BW knowledge measures that aim to reduce BW purchase among young adults in different marketing channels, especially the popular social media platforms. Young adults, including college students, remain a key consumer segment for this line of research. This is because, when properly motivated, they have the capacity to become social trend setters and could become avid environmental conservation advocates.

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## Appendix A

Table A1. Measurement Items.

Variables (Explained Variances)	Items	Factor Loading	Alpha Value
Trust in BW Adverts (N/A)	How much do you trust the information originated from the following sources? "Bottled water adverts/commercials" (e.g., Dasani, Poland Spring, Evian or Fiji). (1 = Don't trust at all to 7 = Totally trust)	N/A	N/A
Cognitive Beliefs (65.02%)	I drink bottled water bought from a store because ____ (1 = Strongly Disagree to 7 = Strongly Agree): It tastes good. It is clean. It is from pure and natural water sources. It is safe. It contains ingredients good for health.	0.75 0.73 0.83 0.66 0.63	0.86
Affective Beliefs (76.78%)	I drink bottled water bought from a store because (1 = Strongly Disagree to 7 = Strongly Agree): It looks cool to carry store-bought bottled water around. I like the shape/design of the store-bought bottle. I like the reputation of bottled water brands/companies.	0.66 0.72 0.92	0.85
False Knowledge (N/A)	Please indicate whether the following statements are true or false (0 = False, 1 = True). Most people consume a lot of bottled water. (False) The regulations for producing bottled water are very strict. (False) Bottled water is originated from spring water in nature. (False) Most people prefer bottled water over tap water. (False) Most single-use water bottles are recycled into other useful products. (False) Single-use bottled water is different from tap water. (False) Single-use water bottles don't have much impact on the environment. (False)	N/A	N/A
Factual Knowledge (N/A)	Please indicate whether the following statements are true or false (0 = False, 1 = True) The cost of getting an annual supply of bottled water is about 100 times more than that for the same amount of tap water. (True) There are stricter regulations for bottled water than for municipal tap water. (False) Over-pumping of aquifers (i.e., a body of permeable rock that can contain or transmit groundwater) for producing bottled water has led to lowering of the water tables. (True) It takes less amount of water to produce the bottle as it does to fill it (False). Producing disposable plastic water bottles requires the use of millions of barrels of oil. (True) Over half of bottled water sold in the U.S. is tap water. (True) Three of five single-use water bottles are recycled in the U.S. (False)	N/A	N/A
Attitude (70.53%)	(1 = Strongly Disagree to 7 = Strongly Agree) I feel that consuming single-use bottled water: is a good habit. I feel that consuming single-use bottled water: is good for my health. I feel that consuming single-use bottled water: suits my lifestyle. I feel that consuming single-use bottled water: makes me feel good about myself. I feel that consuming single-use bottled water: connects me to nature.	0.78 0.71 0.81 0.85 0.68	0.90

Table A1. Cont.

Variables (Explained Variances)	Items	Factor Loading	Alpha Value
Subjective Norm (78.48%)	(1 = Strongly Disagree to 7 = Strongly Agree)		0.91
	People in my social circle won't discourage me from purchasing single-use bottled water.	0.75	
	People in my social circle approve of my frequent consumption of single-use bottled water.	0.93	
	People in my social circle support my preference for single-use bottled water.	0.91	
	People in my social circle won't be displeased, if I spend heavily on single-use bottled water.	0.77	
Purchase Intention (58.33%)	I plan to purchase bottled water, next time _____ (1 = Strongly Disagree to 7 = Strongly Agree)		0.92
	when I go run errands	0.82	
	when I attend indoor events such as going to a movie or shopping mall	0.70	
	when I exercise in the gym	0.71	
	when I attend outdoor events such as going to a football game or a baseball game	0.72	
	when I exercise outdoors, e.g., jogging or hiking	0.75	
	when I order food at an eatery such as a deli, bakery, coffee shop or cafeteria	0.67	
	when I buy grocery	0.74	
	when I stop at a convenient store	0.73	
	when I am thirsty	0.68	
when I go to school/work	0.77		

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