KNOWLEDGE ISN'T EVERYTHING: DEVELOPMENT OF A THEORY OF PLANNED BEHAVIOR QUESTIONNAIRE FOR THE EXPLORATION OF HEALTHY BEVERAGE CONSUMPTION

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ABSTRACT

Research documents an increase in the consumption of sweetened beverages within the United States. This trend is important as sweetened beverage consumption is consistently associated with high BMI, weight gain, diabetes, and several related health problems (Harvard University School of Public Health, 2023). While researchers have looked at marketing's role in promoting sweetened beverages, research leading to an understanding of the behavioral antecedents of beverage consumption is scant. Extant literature supports the premise that knowledge of the benefits (dangers) of healthy (unhealthy) activity alone is insufficient to evoke behavioral change. To this end, this paper employs the Theory of Planned Behavior (Ajzen, 1991, 2002, 2006, 2010, 2020; Ajzen & Fishbein, 2000; Ajzen et al., 2011; Barbera & Ajzen, 2022) to investigate the relationship between the antecedents of behavior; (attitudes, subjective norms, and perceived behavioral control), and the consumption of healthy versus sweetened beverages. Results showed that attitudes and perceived behavioral control significantly influenced behavioral intentions, while subjective norms had minimal impact on healthy vs sweetened beverage choices. Overall, all three factors effectively drove behavioral intentions and behaviors. Thus, we argue that marketing (demarketing) campaigns focused on increasing (decreasing) healthy (unhealthy) beverages should be positioned to address these antecedents. Research and managerial implications are explored.

Keywords: *Theory of Planned Behavior, sweetened beverages, behavior change, dietary change, diabetes*

INTRODUCTION

Sweetened beverages, defined as sodas, energy drinks, fruit punches, sweetened teas, and real fruit juices with added sugar, sugared coffee, and sports drinks are now the largest single source of sugar in the American diet (Harvard University School of Public Health, 2023). Such beverages supply two to four times the daily recommended sugar intake per 8oz serving (California Center of Public Health, 2009; Harvard University School of Public Health, 2023). Consumers have substantially increased their consumption of sweetened beverages over the last 45 years (Frank, 2004; Briefel and Johnson, 2004; Duffey and Popkin, 2007; Lu et al., 2014;

American Heart Association, 2022; Harvard School of Public Health, 2023). This trend hurts consumers and the marketplace in general.

Sweetened beverage consumption's dramatic implications on public health, especially as causes of obesity and diabetes, have been well documented. For example, the average American consumes 800 cups of sweetened beverages annually (2.19 cups a day), drinking four to eight times the recommended sugar intake yearly (Harvard University School of Public Health, 2023). Of note, adults who drink one or more sweetened beverages daily, more than 365 sweetened beverages annually, are 27% more likely to be overweight (Must et al., 2009; California Center for Public Health, 2009; Harvard University School of Public Health, 2023). In addition to obesity, the excess consumption of added sugars, especially from sugary drinks, has also been linked to an increase in the development of type-2 diabetes in adults and adolescents that has created a national health crisis (Schulze et al., 2007; the American Heart Association, 2022). Indeed, a global status report indicated that sweetened beverages were a primary contributor to non-communicative diseases (including type 2 diabetes), posed a significant cause of stress on global health systems and the world's socioeconomic development, and urgently required research and practice aimed at reducing their consumption (Te et al., 2019).

A look at the cost and negative impact of sweetened beverages is exemplified in the case of its relationship with diabetes. Current estimates suggest that 37 million Americans (11% of the population) have type 2 diabetes, and another 97 million (29% of the population) have prediabetes (blood sugar levels that are predictive of one becoming a type 2 diabetic in the future) (Harvard School of Public Health, 2023). Further, diabetes costs the country over $327 billion per year, with $237 billion attributed to direct costs (hospital inpatient care, prescription medications, anti-diabetic agents and diabetes supplies, and physician office visits) and another $90 billion attributed to loss of productivity (increased absenteeism, reduced productivity while at work, the inability to work as a result of diabetic disability and lost productive capacity due to early mortality) (Te et al., 2019). To this end, policymakers, researchers, and practitioners have focused on changing the public's consumption practice by increasing (decreasing) the availability of unsweetened (sweetened) drinking options (i.e., the removal of sodas in school vending machines) and increasing no-sugar or low sugar branded offerings (i.e., Coke Zero).

Notably, marketing research and tactics have also focused on changing consumers' consumption behavior with "knowledge programming," marketing that seeks to increase consumers' knowledge of the consequences of consuming sweetened beverages. Still, the consumption of healthy drinks, along with the number of type 2 diabetes patients and the associated annual cost of diabetes, is on the rise. It has been estimated that if all things remain constant, the number of Americans under the age of 20 with type 2 diabetes will increase by approximately 675% by 2060 (Dillinger, 2022). Thus, we question whether knowledge programming effectively changes consumers' consumption of sweetened beverages. The purpose of this paper is to 1) identify additional predictors of behavioral change regarding (healthy vs. sweetened) beverage choices and to develop a questionnaire that can be used to explore healthy vs. sweetened beverage choices. More specifically, the goal is to test a more holistic model, the Theory of Planned Behavior (TPB), and to create a valid scale for measuring its antecedents' effective paths for behavior and, thus, suggest paths for influencing behavioral change. The TPB

was selected due to its usefulness in effectively predicting healthy eating habits in various populations (for example, see Barnes et al., 2007) and its ability to provide a pathway to scale development across multiple disciplines (for example, see Barnes et al., 2007; Rudea et al., 2015; Moeini et al., 2023; Shanbhag et al., 2023). To this end, this paper is constructed in the following manner. First, we review prior research on knowledge programming and provide evidence of its limitations in evoking change behaviors. We next ground our research for behavioral change within the Theory of Planned Behavior. We then administered two pretests to gain an understanding of beverage consumption within a college dining hall and to aid in the development of a Theory of Planned Behavior questionnaire. Next, we construct the TPB questionnaire (see Ajzen 2006) and leverage it to explore its proposed behavioral antecedents' (attitude, subjective norms, and perceived behavioral control) contribution to behavioral intent (time 1) and actual behavior (time 2). The steps for creating and implementing the TBP Questionnaire (Ajzen, 2006) are outlined in Table 1.

TABLE 1: TBP QUESTIONNAIRE DEVELOPMENT

Step	Number of Subjects	Overview
1. Item Generation and Initial Questionnaire Development	Pretest 1 (N = 47)	Formulation of five to six seven-point-bipolar scale items for each of the theory's major constructs Formation of 44 scale items. Two expert judges remove ambiguous or redundant items to create a parsimonious ten-item scale. Clearly Define the behavior of interest in terms of Target, Action, Context and Time (Tact)
2. Scale Purification	Pretest 2 (N = 371)	Inter-item correlations suggested the elimination of one item to create a 9-item scale.
3. Further Scale Validation and Test-Retest Experimentation	Study 1 Time 1: Intention (N = 282) Time 2: Behavior (N = 262)	Confirmatory Factor Analysis was conducted to check the validity of the scale. Scale measures were regressed on behavioral intentions (Time 1) and behavior (Time 2)

LITERATURE REVIEW

Educational Arguments and Behavioral Change

Scholars and practitioners in healthcare, public policy, and marketing have attempted to change unhealthy choices to more healthy ones but have yet to provide insight into strategies for long-lasting success. These results are chiefly predicated on programs that attempt to manipulate knowledge to achieve behavioral change. Such research and practice have focused on modifying behavior by increasing educational materials and healthy options or changing recommended consumption guidelines (Duffey, Popkin 2007), which we will refer to as "knowledge programs."

Knowledge programs are rooted in the theology that behavioral changes will follow educational information, which attempts to increase consumers' knowledge about the benefits of the desired behavior, the dangers of the undesired behaviors, or some combination of the two. The premise of the programming is that humans are rational and, therefore, will rationally change their behavior when presented with convincing arguments. However, humans are not rational animals. Research on persuasion and behavior has shown that increasing peoples' general knowledge using knowledge programs usually fails to produce changes in health behaviors. For example, Congress's attempt to change unhealthy food and beverage behavior through education resulted in the 1990 Nutrition Labeling Education Act (NLEA). NLEA legislated that food and beverage manufacturers place product-specific nutritional information on product labels. Congress assumed that when given knowledge about the nutritional content of food and beverages, people would alter their behavior and make healthier food and beverage choices. While impressive in scope and scale, this countrywide program did not change the consumption of unhealthy foods and beverages (Teisl and Levy, 1997). More notably, the "Got Milk" ad campaign of the 1990s and 2000s that featured celebrities sporting a milk mustache and provided knowledge points about the benefits of milk increased consumers' awareness of milk and its benefits. The celebrated campaign made its mark in advertising by collecting nearly every industry award, including multiple Clio awards, several Effies, several Gold Addy awards, a Silver Lion at the Cannes International Advertising Festival, and a David Ogilvy Research Award. Still, this knowledge-based programming did not increase the consumption of milk. Indeed, one study suggested that the tagline "got milk" slogan achieved national awareness at a rate 12 times greater than the slogan for Pepsi, six times greater than the sports drink Gatorade's tagline, and four times greater than Coke's. However, sales of these sugary beverages increased while milk consumption per person declined by 20% during the period of the ad campaign (USDA/Economic Research Service, 2006). Thus, to change health behavior, realizing why such knowledge programming falls short is essential.

Ajzen (2010) stated that accurate information is neither sufficient nor necessary for the performance of a desired (health-related) behavior, and thus, most knowledge-based health education programs are "useless." The general finding buttresses this argument that knowledge of the benefits or risks of a behavior does not correlate with participation in the behavior (Wallace, 2002). Indeed, Wallace's (2002 p. 170) research regarding Osteoporosis prevention among college-age women posits that "knowledge has been consistently shown to be non-influential in predicting behavior." Further, Feeley and Servoss (2005) found a negative correlation between knowledge about being an organ donor and the actual practice of signing up to be an organ donor. Indeed, Ajzen et al. (2011) found that knowledge of the ill effects of alcohol was unrelated to drinking behavior and that environmental knowledge had no effect on energy conservation. Vicerra (2021) also finds that higher levels of knowledge about COVID-19 were not correlated to behavior regarding COVID-19 prevention practices among older consumers. Research on "green consumption" suggests that knowledge alone cannot contribute to the formation of attitudes nor resulting "green consumption behaviors (Zhou et al., 2022).

Regarding changing consumption behaviors of sweetened beverages to healthy ones, little evidence shows that knowledge programs can effectively moderate such change. Indeed,

previous studies have shown little to no correlation between the increased knowledge generated by educational programs on weight loss, dieting, low-fat diet, eating fruits and vegetables, or food choices (Ajzen, 2010). Again, the reason for such is that knowledge programming seeks to change behaviors based on the premise that exposure to factual information will lead to new or changed attitudes. However, this is not how information and attitudes are used in decision-making behaviors. To this end, we focus on additional literature streams regarding information attitudes and behaviors.

The Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1980; Petty & Cacioppo, 1981; Petty et al., 1983; Bennett et al., 2020; Bennett et al., 2022) provides insight into how attitudes are used and formed. ELM states that people make decisions via one of two pathways: the central or peripheral routes. The central processing route is used when consumers face a complex decision. Here, consumers leverage energy and effortful thought processes for decisions that they feel most deserve time for reflection. Here, strong arguments based on information increase the formation of a positive attitude toward an object (Petty et al., 1994; Bennett et al., 2020; Bennett et al., 2022). Hence, the result of central processing is the formation of enduring attitudes that predict behavior. In the case of the sweetened versus healthy beverage choice, increased information could lead to adequately formed knowledge and would be considered a strong argument, thus leading to attitudes and subsequent behavioral change. That is, if the central processing route were used. However, for most people, beverage choice is a simple decision processed in the peripheral route.

The ELM posits that people have neither the ability nor motivation to carefully evaluate information available prior to committing to a behavior. Therefore, individuals sometimes form attitudes about behaviors by leveraging peripheral processing routes. Here, simple heuristics aid decision-making, such as a celebrity's endorsement, to cue the product's efficacy (Petty et al., 1994; Bennett et al., 2020; Bennett et al., 2022). This buttresses the notion that knowledge programming which points out the benefits or dangers of a product will not aid in the decision process regarding beverages. Thus, to effectively change behaviors, models that leverage such educational programming will be abandoned at this point in the pursuit of exploring more holistic theories of behavior and behavioral change.

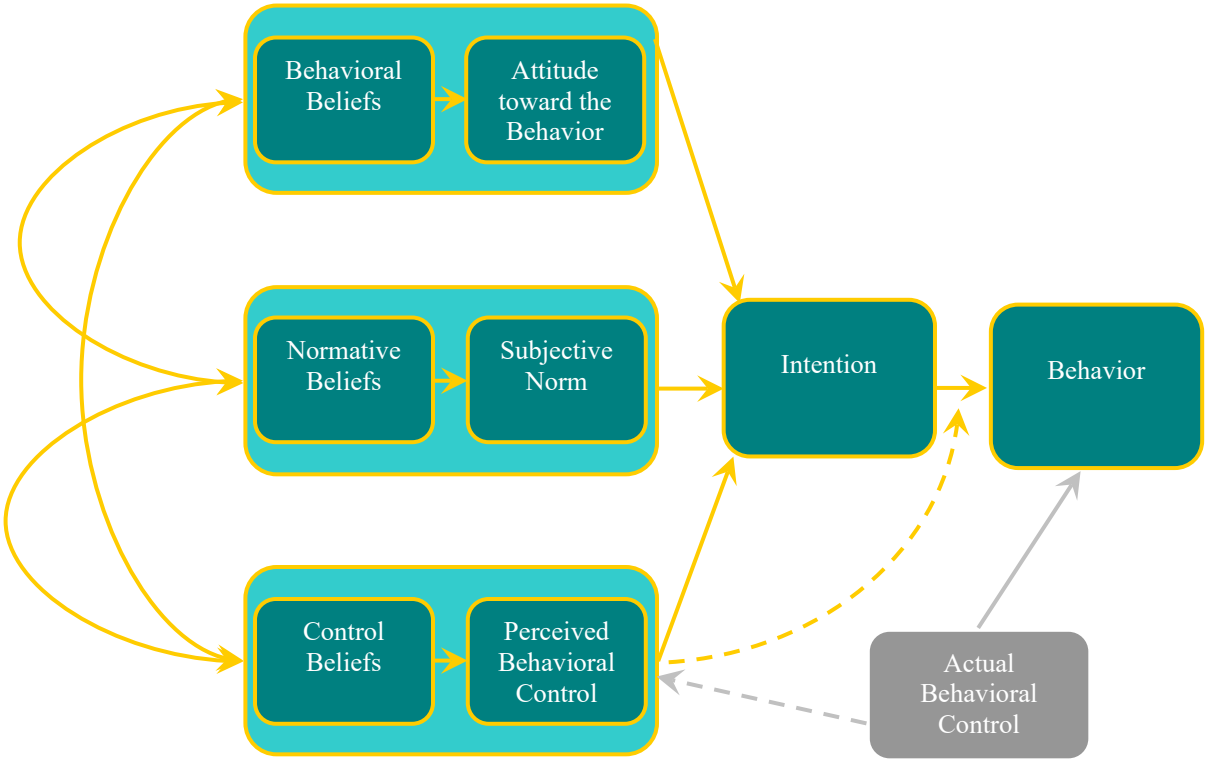
The Theory of Planned Behavior and Hypothesis Development

The theory of planned behavior (TPB) does not leverage knowledge as a predictor of change in the traditional knowledge programming sense. Importantly, the TPB posits that knowledge (alone) is not the antecedent to attitudes and that attitudes are not the only path to behavior. Indeed, TPB was constructed to explain three key antecedents' contributions to the adoption of specific behaviors. TPB posits that behavior is the product of three antecedents: attitudes, subjective norms, and perceived behavioral control. These antecedents are each based on the preexisting determinants of behavioral beliefs, normative expectations, and control beliefs, respectively (see Figure 1) which are influenced by knowledge and other background factors such as age, race, and culture (Ajzen 2002, 2006, 2020). Collectively, behavioral beliefs shape a person's attitude toward a behavior, either favorably or unfavorably. Normative beliefs

contribute to the perception of social pressure or subjective norms. Control beliefs, on the other hand, influence the perception of behavioral control or self-efficacy (Ajzen, 1991, 2006, 2020; Ajzen et al., 2011; Ajzen & Fishbein, 2000; La Barbera & Ajzen, 2022). In general, the TPB posits that when one holds a positive (negative) attitude, perceives social approval (disapproval), and feels a sense of being (not being) in control, their intentions to pursue (abandon) a particular behavior tend to be more robust (Ajzen, 1991, 2020; Ajzen et al., 2011; Ajzen & Fishbein, 2000; La Barbera & Ajzen, 2022).

It should be noted that the term "planned behavior" does not assume that actors are rational in their actions. On the contrary, the TPB does not posit that behaviors form without bias or rationality. Nor does it assume that one's attitudes, subjective norms, and perceived behavioral control represent reality accurately (Ajzen, 2011). Indeed, attitudes, subjective norms, perceived behavioral control, and their preexisting determinants of behavioral beliefs, normative expectations, and control beliefs may all rest on irrational premises, misinformation, biased judgments, and responses to emotions such as fear or jealousy. The behavior here is "planned" because regardless of how one arrives at their beliefs, normative expectations, and control beliefs, their attitudes, subjective norms, and perceived behavioral control then predict (plan) the behavior (Ajzen, 2011). Perhaps this inclusion of emotion void of rational thought is why the TPB offers a better path to understanding behaviors than knowledge programming. We next explore the TPB's three antecedents in more detail.

Figure 1: The Theory of Planned Behavior Model (Ajzen 1991)



Attitudes Toward the Behavior

Attitudes are one's degree of unfavorable or favorable feelings regarding a person, place, idea, or thing (Ajzen 1991, 2020). Attitudes are one of the central antecedents of behavior and, thus, behavioral change (Petty et al., 1983; Bennett et al., 2020; Bennett et al.,2022). Ajzen (2010) defines *attitudes* as the "readiness to respond to a psychological object with some degree of favorableness that may range from extremely negative to neutral to extremely positive." The TPB goes beyond the notion that attitudes alone predict behavior or that knowledge will change attitudes. Conventionally, *knowledge* is considered to be consumers' access to factual pieces of information, and thus, educating or exposing consumers to such information should lead to educated (good) decisions. However, in the TPB model, knowledge is not reflective of factual pieces of information at all. Indeed, Ajzen (2002) states, "Educational messages do not play a role in TPB; rather, information in the form of beliefs will lead to attitude formation regardless of how factual the information is." What matters within the TPB model is not whether the information the sender applies is true but rather what prior knowledge the receiver believes to be true, as beliefs are the determinants of attitude formation and, subsequently, behavior intent and

behavior (Ajzen, 1991, 2005, 2020; Ajzen et al., 2011; Ajzen & Fishbein, 2000; La Barbera & Ajzen, 2022).

Subjective Norms

Subjective norms reflect an individual's (normative) beliefs about what others think he or she should do. They deal with how one thinks others will view his or her actions. Subjective norms are influenced by source factors, such as age, sex, socioeconomic status, and numerous other variables (Ajzen 1992, 2002, 2010; La Barbera and Ajzen, 2022). In addition, subjective norms are influenced by the opinions of an individual's reference group members, including family, friends, teachers, and other influencers such as celebrities. In marketing, this deals with more than just the behavior of purchasing and using a product but also the marketing of oneself to others by doing so. As consumers construct messages to others through purchases (Belk, 1988; Belk, 2006; Wohlfeil & Whelan, 2012; Bennett et al., 2020; Bennett et al., 2023), here the seemingly "I am what I purchase" statement is really the "I hope you think I am what I purchase" desire.

Perceived Behavioral Control

Perceived behavioral control provides insight into whether individuals feel they have the skills, time, and resources to act (Ajzen 1991, 2002, 2010, 2020; La Barbera and Ajzen, 2022). Hence, perceived behavioral control is predicted by readily accessible beliefs about moderators of control over performance outcomes. Perceived behavioral control measures the extent to which an individual perceives his or her ability to perform an event (Ajzen, 1991. 2002. 2010, 2020; La Barbera & Ajzen, 2022). Ability ranges from easy, those activities needing little to no effort, to difficult activities requiring special skills or resources. Moreover, actual control, typically an unavailable measure, is considered a moderator of intentions. In the absence of actual control, perceived behavior control is typically an accepted substitute (Ajzen, 1991, 2002, 2005, 2010, 2020; La Barbera and Ajzen, 2022). Within the TPB model, perceived behavioral control is positioned veridically to actual control as it can serve as a proxy for actual control when predicting the behavior in question. Based on this understanding of the TBP model, we propose the following hypotheses:

H1a: Attitude, subjective norms, and perceived behavioral control are correlated to behavioral intention.

H1b: Behavioral intentions are correlated to behavior.

Further, subjective norms deal with how one thinks others will approve of their behavior. While we posit that subjective norms would be a strong indicator of the conspicuous consumption of a beverage in some instances (i.e., the choice of an acholic beverage at a bar, a virgin daiquiri vs. a shot of whisky, may send messages to those in attendance of one's self-brand), we do not think the same applies to the consumption of everyday beverages that are typically consumed conspicuously at breakfast, lunch, or dinner. Thus, we predict the following:

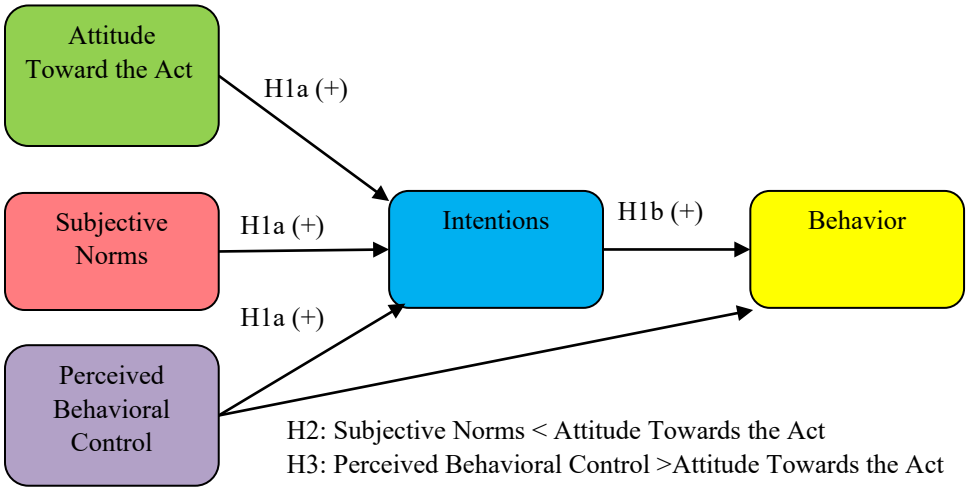
H2: Subjective norms will hold the weakest effect on behavioral intentions.

Perceived behavioral control in this context may relate to access to the options offered by the vendor as well as the consumer's addition to caffeine or sugar; thus, we hypothesize that:

H3: Perceived behavioral control will correlate more strongly to behavioral intention than subjective norms.

These hypotheses are outlined in Figure 2

FIGURE 2: HYPOTHESES DELEINATION FOR THE THEORY OF PLANNED BEHAVIOR INTENTIONS AND BEVERAGE CHOICE



METHODOLOGY:

The Theory of Planned Behavior has been used widely to determine drivers of human behavior. Indeed, at the time of this article's publication, a Google Scholar search for Ajzen's (1991) theory introduction indicates that the article has been cited over 128,000 times across scores of social sciences, including psychology, sociology, education, social work, marketing, and management. One aspect of the theory that makes it so applicable is the framework Ajzen (2006) created, which allows for novel scale development (a TBP questionnaire) and experimentation specific to the context and domain being investigated. That is to say, there is not one TBP scale that scholars adjust for their purposes. Rather, Ajen (2006) introduced a framework for developing a scale for measuring the constructs within the TBP model (Ajzen, 1991). The steps for creating a TBP questionnaire and experiment are as follows.

Item Generation and Questionnaire Development:

Because attitudes, subjective norms, and perceived behavioral control are latent constructs, initial scale items are obtained through direct observation or self-reports. These self-reports are generated in pretest from focus groups, journals, or other qualitative methods. Next, items are generated for each latent construct. Within these subscales, the behavior of interest must be specified in terms of Target, Action, Context, and Time (TACT). For example, a study of cheating could define TACT as college students (target) cheating (action) on exams(context) at the end of the semester (time) (see Ajzen 2006).

Scale Purification:

The scale is next administered in a second pretest. Here, items are analyzed using Cronbach's Alpha and removed and revised if needed.

Further Scale Validation and Test-Retest Experimentation:

The scale should be administered to respondents in a test (behavior intention = time 1) and a retest (actual behavior = time 2) experiment. Confirmatory Factor Analysis should be conducted to check the validity of the scale, and scale measures should be regressed on behavioral intentions (Time 1) and behavior (Time 2) to test the hypothesis presented fully.

Pretest 1, Item Generation and Questionnaire Development

The first step in creating a TPB questionnaire is the formulation of five to six seven-point-bipolar scale items for each of the theory's major constructs *(*Ajzen, 2006). To this end, a pretest was created to aid in the development of a TPB scale. Following the instructions from *Constructing A Theory of Planned Behavior Questionnaire (*Ajzen, 2006), a small sample of students (n = 47, self-reporting male = 40%, female = 60%, average age = 20) from a major northeastern university were used to represent the larger student population. The students were given extra credit for participating in this study or another option. In order to gain an understanding of readily accessible behavioral outcomes, normative referents, and control factors, the subjects were asked to answer open-ended questions regarding how often they drank a healthy beverage in the university's dining commons for at least one meal a day over the last two weeks.

Pretest 1Results

Of note, students' insights on things that might limit their perceived behavioral control within the dining halls were most unexpected and, therefore, most helpful. Students provided insights on beverage decisions. For example, the students suggested that long lines and broken or empty containers for healthier options will cause students to look for alternatives. These are

reflected in students' statements below in response to why they would choose a sweetened beverage.

"You got just a few juice machines and all the soda machines."
"The juice machine is always empty and the milk machine is broken"

Two judges evaluated the content of the resulting data. Each judge placed answers into lists of modal salient outcomes, referents, and control factors, first as individuals and then collectively. Recurring themes led to the creation of 44 scale items. The two expert judges remove ambiguous or redundant items. Disagreements in item placement between the judges were settled via discussion. The remaining ten scale items were then used in item construction for a TPB questionnaire.

Next, in agreement with Ajzen's (2006) instruction on constructing a TPB questionnaire, the behavior of interest was clearly defined in terms of its target, action, context, and time elements (TACT). The target population of interest was clearly defined as college students. Action, context, and time were defined as "How likely is it that you will drink healthy beverages with each meal you eat in the dining commons in the next seven days?" Respondents were given a seven-point bipolar scale (Table 1) to measure each of three to five items formulated for each antecedent of behavior, intention, attitude, perceived norms, and perceived behavioral control.

Pretest 2, Scale Purification

Following strictly the instructions for creating a TPB questionnaire (Ajzen, 2006), a survey was constructed using the ten items created in pretest 1. Students (n = 371, self-identifying as male = 41%, female = 58%, average age = 19) from a major university in the northeast completed the questionnaire regarding their beverage choices within the university's dining hall. The questionnaire was administered online, and students were allowed to take the survey alone in the location of their choice at the time of their choice within a one-week range. Students were compensated for time with extra credit in a
current class.

Pretest 2 Results

The questionnaire results were tabulated, and items for each antecedent were analyzed to determine if they effectively measured the antecedent (Spector, 2005). Inter-item correlations suggested that several questions were vaguely worded or not related. It was determined that items should be further analyzed and removed if necessary. In accordance with Ajzen (2006 p. 5), "this selection can rely on item-total correlations (Likert's criterion of internal consistency), or an analysis of reliability (e.g., Cronbach's alpha)." A reliability analysis was performed using SPSS 28. The scale reliability was assessed using Cronbach's Alpha. As a general rule, a Cronbach's Alpha of "0.6-0.7 indicates an acceptable level of reliability, and 0.8 or greater a very good level" (Ursachi et al., 2015, p.681). The ten-item scale produced a Cronbach's alpha of .598. The analysis suggested that removing one item would increase the score to that of .614,

and removing any other item would decrease the overall Cronbach's alpha (see Table 2). Thus, one item was removed, creating a stable scale with a Cronbach alpha greater than .6.

TABLE 1: ITEM-TOTAL STATISTICS

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Long lines and unavailability make drinking healthy beverages is… (Very Inconvenient – Very Convenient)	44.42	38.901	0.158	0.599
Consuming less tasty beverages is.. (Extremely Bad - Extremely Good)	45.20	38.706	0.118	0.614
Signs in the Dining Commons to drink healthy beverages…will be very useful reminders for me. (Strongly Disagree – Strongly Agree)	44.53	35.190	0.234	0.588
Having limited options will make drinking healthy beverages (Much More Difficult – Much Easier)	45.23	37.330	0.209	0.589
When it comes to drinking healthy beverages, how much do you want to do what your family members think you should do? (Strongly Disagree – Strongly Agree)	43.23	32.028	0.502	0.507
When it comes to drinking healthy beverages, how much do you want to do what your doctor thinks you should do? (Strongly Disagree – Strongly Agree)	42.80	33.368	0.486	0.517
When it comes to drinking healthy beverages, how much do you want to do what your friends thing you should do? (Strongly Disagree – Strongly Agree)	44.29	32.912	0.381	0.541
Consuming more vitamins, minerals and calcium is…(Extremely Bad – Extremely Good).	41.83	39.693	0.273	0.578
Strengthening my immune system is...(Extremely Bad – Extremely Good).	41.67	40.947	0.210	0.588
Controlling my body weight is.. (Extremely Bad – Extremely Good).	41.94	39.612	0.243	0.581

Study 1, Further Scale Validation and Test-Retest Experimentation

Study 1, Behavior Intent (Time 1)

A total of 282 students (self-identifying as male = 37%, as female 62%, average age = 20) from a major northeastern university completed two sets of surveys. Students were compensated for their involvement with extra credit in a current class. Items in the questionnaire were created for each construct in the TPB model and leveraged the key learning from the two pretests.

Students were informed during class time and again by email that they may fill out a survey on health behavior in return for extra class credit. The students were informed that a follow-up survey and email would take place two weeks later. The informative email included instructions for taking the survey and a link to the survey website. The students were advised to take the survey individually. Students were allowed to take the survey at any time and at a place of their discretion within a 5-day time period. Over 80% of the surveys were completed within the first 48 hours.

Study 1, Behavior (Time 2)

To measure the students' actual behavior, a follow-up survey (time 2) was administered to the same sample that took the initial (time 1) survey. A total of 262 of the 282 students (93%) from the initial study participated in the second part of the study two weeks after later. As in time 1, the students were given extra credit for their participation, instructed to fill out the survey individually, allowed to fill it out online at a place and time of their discretion, and given five days to complete the task. Over sixty percent of the surveys were completed within the first 48 hours of administration.

The surveyed behavior of interest was the student's behavior in terms of beverage choice over the past seven days. Here, behavior was clearly defined in terms of its target, action, context, and time elements (TACT) as follows, "In the past seven days, how often did you drink a healthy beverage with each meal you had in the Dining Commons. Scale items for behavioral intent were altered slightly to create measures of actual behavior (Ajzen 2006).

Study 1, Analysis and Results

While TPB results are commonly analyzed by adding up the scores of each antecedent prescribed measure and using OLS regression (Ajzen 2006), we felt that it was necessary to leverage an Exploratory Factor Analysis (EFA) to ensure that the scale items created for the TPB questionnaire were actually measuring the constructs they were intended to measure. To this end, we sought to determine if the scale measures loaded on the theoretical antecedents they were prescribed to load on. We make this adjustment based on two observations. First, we find that the recommended aggregation of data is more applicable to physical measurements, such as length or weight, rather than to latent constructs, such as attitude, which are imperfectly measured (Keller, 2010). Second, we need to explore the possibility that there are not more (or less) than three factors that are able to explain the majority of variance across the attributes.

The ten scale items from our TPB questionnaire were factor analyzed using a Principal Component Analysis with orthogonal (varimax) rotation. The resulting screen plot's point of inflection indicated the formation of a stable plateau after three factors (see Figure 3). The EFA produced three factors, one for each of the expected antecedents, that explained 61.5% of the variance between the attributes (see Table 3). However, all the attributes loaded favorably on their predicted factors, with each having a strong loading (above .6) on its intended factor and non-holding heavy cross-loadings (above .4) on additional factors (Brakus et al., 2009; Bennett et al., 2023).

FIGURE 3: TPB QUESTIONNAIRE EFA SCREE PLOT

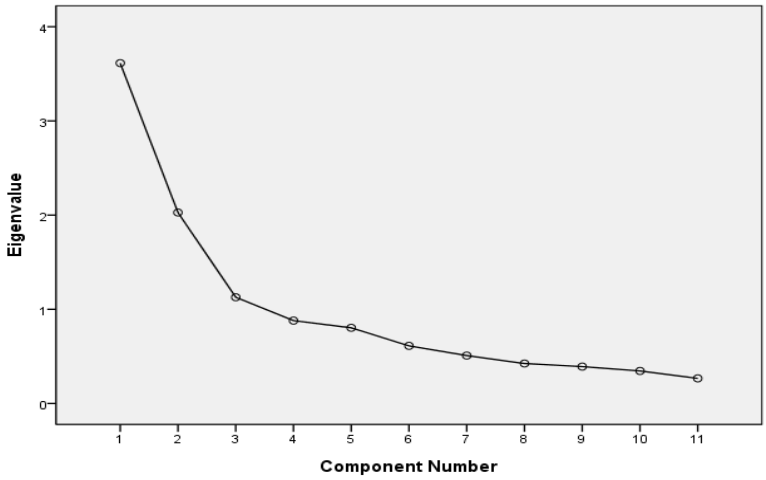


TABLE 3: STUDY 1 TPB QUESTIONNAIRE EXPLORATORY FACTOR ANALYSIS RESULTS

Rotated Component Matrix[a]

	Component		
	1	2	3
	PBC	Sub Norm	Attitude
PBC 1: Long lines and unavailability make drinking healthy beverages…(Very Inconvenient – Very Convenient)	.792	.049	.116
PBC 2: Signs in the Dining Commons to drink healthy beverages…will be very useful reminders for me. (Strongly Disagree – Strongly Agree)	.700	.259	.037
PBC 3: Having limited options will make drinking healthy beverages (Much More Difficult – Much Easier)	.784	.134	.086
SN1: When it comes to drinking healthy beverages, how much do you want to do what your family members think you should do? (Strongly Disagree – Strongly Agree)	.292	.646	.204
SN2: When it comes to drinking healthy beverages, how much do you want to do what your doctor thinks you should do? (Strongly Disagree – Strongly Agree)	.028	.833	.004
SN3: When it comes to drinking healthy beverages, how much do you want to do what your friends thing you should do? (Strongly Disagree – Strongly Agree)	.058	.627	-.312
Attitude 3: Consuming more vitamins, minerals and calcium is…(Extremely Bad – Extremely Good).	.151	-.026	.870
Attitude 1: Strengthening my immune system is...(Extremely Bad – Extremely Good).	.365	.166	.504
Attitude 2: Controlling my body weight is.. (Extremely Bad – Extremely Good).	.072	-.035	.881

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 4 iterations.

Component Transformation Matrix

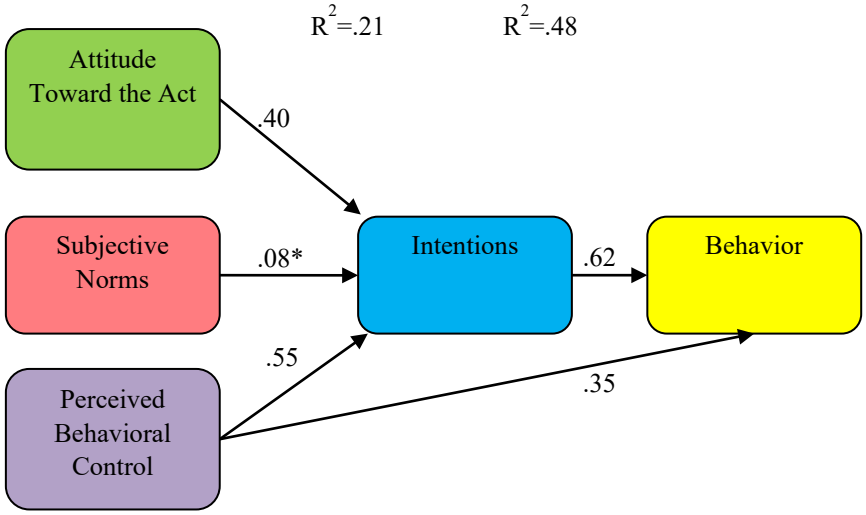
Component	1	2	3
1	.748	.467	.472
2	-.023	.728	-.685
3	-.664	.501	.555

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Next, the composite scores of each factor were regressed on behavior intention and behavior. Our findings showed a significant correlation between attitudes, subjective norms, and perceived behavioral control and behavioral intention (R^2 = .21) as well as behavior (R^2 = .48) (see Figure 3). Thus, we are able to support H1a and H1b. The regression also provided evidence that perceived behavioral control (B = .55, sig = .000) is the strongest predictor of behavior intention and that subjective norms (B = .08, sig = .355) were the weakest (See Figure 3). Thus, we are able to support H2 and H3.

Overall, these studies provide evidence that attitudes and perceived behavioral control are antecedents for behavioral intentions and behavior. Specifically, our findings suggest that while attitude is a strong predictor of behavior, attitudes alone are not the only route to behavioral change. This is in line with past research finding, which has suggested that attitudes, subjective norms, and perceived behavioral control are predictors of behavioral intentions and behaviors.

FIGURE 4: PATH ANALYSIS FOR THE THEORY OF PLANNED BEHAVIOR INTENTIONS AND BEVERAGE CHOICE



All regression coefficients are significant at the 0.000 level except for subjective norms to behavior intentions which was insignificant (.355) (see Table 4 and Table 5).

TABLE 4: REGRESSION OUTPUT FOR BEHAVIOR INTENTIONS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.455[a]	.207	.198	1.34992

a. Predictors: (Constant), A-R factor score 3 for analysis 7, A-R factor score 2 for analysis 7, A-R factor score 1 for analysis 7

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.863	.080		72.941	.000
	Attituded	.404	.081	.268	5.014	.000
	Subjective Norm	.075	.081	.050	.927	.355
	PBC	.548	.081	.364	6.810	.000

a. Dependent Variable: Intentions Scale

TABLE 5: REGRESSION OUTPUT FOR BEHAVIOR

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.695[a]	.482	.478	1.19258

a. Predictors: (Constant), Intentions Scale, A-R actor score 3 for analysis 7

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.201	.335		9.569	.000
	PBC	.351	.086	.214	4.099	.000
	IntentionsScale	.624	.055	.588	11.293	.000

a. Dependent Variable: Behavior Scale

DISCUSSION

There has been a growing concern about the ill effects of sweetened beverages. To combat this, researchers and practitioners seek to change consumer behavior with knowledge

programming, educating consumers on the benefits or risks of a behavior. However, these attempts have had limited results. This is due to a knowledge behavior gap as consumer attitudes reflect their beliefs, which are weighted on what they think to be true rather than what messages they receive. To this end, we sought to identify and test a model that provides a more holistic approach to identifying and measuring the antecedents of behavior to suggest more effective paths to evoking behavior change. The Theory of Planned Behavior model was adopted for this purpose. The model includes the construct of attitudes and the antecedents of perceived behavioral control and subjective norms as predictors of behavioral intentions and change. In creating a TPB questionnaire, nine items were employed to measure consumers' attitudes, subjective norms, and perceived behavioral control as it relates to sweetened vs healthy beverages. Our results indicate that attitudes and perceived behavioral control significantly affect behavioral intentions. Our model indicated that subjective norms had little impact on behavioral choice within the context of healthy vs. sweetened beverages. Together, all three antecedents proved effective in driving behavioral intentions, which, in turn, predicts behaviors.

These results support each of the stated hypotheses. In addition, this paper produced a valid scale and TBP questionnaire for measuring attitudes, subjective norms, and perceived behavior control as they relate to behavioral intentions and actual behavior. Still, this study is not without limitations. The study leverages a student population's consumption within the dining hall. The student's proximity to and reliance on the dining hall may reduce their beverage choices. The students' age may make subjective norms such as family or doctor's input less important to them than that of the general or older population. Future studies should leverage a more representative sample. Additionally. practitioners and researchers alike should explore the effect of slogan's or claims that promote leverage subjective norm (i.e., "Doctor's recommend," or "nine out of ten moms agree') in their messaging.

Future studies should also explore celebrities as influencers of subjective norms for student populations and beyond. Celebrity endorsements are prevalent in product marketing (Bennett et al., 2020). Celebrity endorser's influence on consumers' subjective norms can be attributed to celebrity inclusion in the consumers' aspirational reference group (Bennett et al., 2020). Aspirational reference groups provide standards of achievement to which consumers aspire. This holds for those members who are further removed from the consumer and whose behavior the consumer watches but has no direct interaction with (Bennett et al., 2020). The possession of products used by aspirational reference group members provides consumers with psychological benefits, including social approval, personal expression, and outer-directed self-esteem (Bennett et al., 2020). Future studies should investigate if celebrity endorsements affect subjective norms. Of interest, future research should explore which types of celebrities (athletes vs actors) are more (less) influential and for which consumer groups.

In conclusion, academics and practitioners who wish to engage in marketing (demarking) campaigns to increase (decrease) the consumption of healthy (unhealthy) drinks would be better served to do so by attempting to change consumers' perceived behavioral control rather than seeking to change attitudes or subjective norms as perceived behavioral control held the strongest correlation to behavioral intent. Based on our findings. managers seeking to change beverage consumption should increase perceived behavioral control by increasing point-of-

purchase messages reminding the consumer of the healthy beverage and ensuring that healthy beverage options are widely available. Thus, we call for further research that investigates messages and marketing that focuses on changing perceptions of perceived behavioral control (i.e., how easy it is to break a bad habit) in an attempt to alter consumers' perceived behavior control.

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