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Consumer attitudes and behavior: the theory of planned behavior applied to food consumption decisions

The author compares the multi-attribute and subjective expected utility (SEU) models popular in research on consumer behavior to the approach offered by the theory of planed behavior (TPB). Unlike the multi-attribute and SEU models, the TPB relies not on revealed preferences to infer the underlying decision process but instead on direct assessment of its theoretical constructs. According to the theory, the consumer's behavior is a function of intention to perform the behavior in question; the intention is based on attitude, subjective norm, and perceived behavioral control with respect to the behavior; and these factors are determined, respectively, by behavioral, normative, and control beliefs. The theory allows us to predict intentions and behavior with respect to the purchase or use of a single brand or product as well as in relation to choice among different brands or products.

1. Introduction

In developed countries, consumers of food products are confronted with a wide array of decisions in everyday life. Not only must they choose among a bewildering selection of different brands of the same products, they must also consider more basic issues in relation to their purchase decisions: how much carbohydrates and fat to include in their diet; whether to buy organically or conventionally grown produce, avoid large fish with a high mercury content, accept the risks of genetically modified foods, give preference to local products; and so forth. Of course, decisions of this kind are, in principle, no different from decisions in other domains. In the present article I contrast approaches to decision-making popular in research on consumer behavior with my own approach to understanding and predicting human behavior. Where possible, I illustrate theoretical points with examples from the domain of food purchase and consumption.

2. The multi-attribute decision model

A popular approach to consumer behavior is grounded in behavioral decision theory (for reviews of this literature, see Goldstein and Hogarth, 1997;

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Shafir and LeBoeuf, 2002). In this approach, consumers are assumed to be rational, making full use of all available information to reach a decision (Peterson and Beach, 1967). When faced with a choice among competing brands or products, they are assumed to first identify the attribute dimensions relevant to the decision and then to evaluate each option in light of these attributes.

Consider, for example, consumers who must decide between two brands of yoghurt. Some attributes, such as the plastic container or the country of origin may be equivalent and hence immaterial to the decision. The decision must rest on other attributes with respect to which the two brands differ, as illustrated in Figure 1. The consumer is assumed to arrive at an overall evaluation of each brand as follows: The subjective value or utility of each attribute is given a weight representing its subjective importance to the decision maker (with the restriction that weights add to one), and the overall evaluation of each brand is obtained by summing its weighted attribute utilities. It is then assumed that the brand with the higher overall evaluation is chosen (Edwards and Fasolo, 2001).

Fig. 1. Attributes of two hypothetical yoghurt brands

Yoghurt Brand A	Yoghurt Brand B
140 calories per serving	90 calories per serving
1% fat	Fat-free
Fruit mixed with yoghurt	Fruit at bottom
Traditional style	Greek style
€ 1.10 per unit	€ 1.60 per unit

It is important to note that in research with the multi-attribute model, investigators rarely if ever actually assess attribute utilities and importance weights. Instead, they typically draw inferences about the decision process by varying the values of the attributes associated with choice alternatives or the conditions under which the decision is made (e.g., under time pressure).

This approach suffers from a number of shortcomings. (1) When the investigator selects the attributes of the decision alternatives, the situation can be unrealistic, creating a choice dilemma that is unlikely to present itself in real life. (2) Consumers are assumed to integrate each of the attributes associated with the different options, and only those attributes. In reality, people usually go beyond the information given, associating additional attributes with the product category not listed by the investigator. (3) Factors unrelated to product

attributes, such as social influence, are not taken into account. (4) The model is not suitable for decisions between two different product categories that vary in relevant attributes, such as the choice between cake and fruit for desert. (5) Finally, the multi-attribute model assumes that the attributes of each choice alternative are known with certainty. Thus, with respect to each of the two brands of yoghurt, the consumers were assumed to know, among other things, its calorie count, fat content, and price. In many situations, however, the attributes or outcomes of choice alternatives are not known with certainty ahead of time.

3. Decisions under uncertainty: the Subjective Expected Utility model

A solution to the last flaw of the multi-attribute model mentioned above is offered by the subjective expected utility (SEU) model, which allows for uncertainty regarding the outcomes of a decision (Edwards, 1954). For example, in most cases, the amount of animal fat in a steak and its health effects are not known with certainty and can only be estimated, as is true of the environmental impact of consuming food that is produced locally as opposed to imported from a distance. As in the multi-attribute model, in the SEU model, it is assumed that an overall evaluation or subjective expected utility is produced for each alternative product and that the decision maker chooses the product with the highest SEU. However, in the SEU model, importance weights are replaced by subjective probabilities. Equation 1 shows the SEU model in symbolic form, where *SEU(P)* is the subjective expected utility of product P; SP_i is the subjective probability that product P has attribute *i*; U_i is the subjective utility of attribute *i*, and the sum is over all attributes.

$$SEU(P) = \Sigma SP_iU_i \quad (1)$$

It is assumed that the decision situation is structured such that the outcomes of the decision are mutually exclusive and exhaustive. In this way, the subjective probabilities of outcomes associated with a given product must sum to one, as can be seen for the hypothetical example in Table 1. This example illustrates the SEU model in relation to a choice between two food products varying on two attribute dimensions: amount of protein and sugar content. The consumer's uncertainty regarding these two ingredients are captured in the subjective probabilities (which can range from 0 to 1) and the subjective values are expressed in the utilities (which, in this example, can vary from –5 to +5).

It can be seen that the utilities of the four possible attribute combinations (outcomes) remain the same for the two products, but the subjective probabilities vary considerably. By multiplying the SP and U values for each product

Tab. 1. Choice between two products varying on two attributes

Product A	High in protein	Low in protein
High in sugar	SP = .30 / U = +3	SP = .40 / U = –4
Low in sugar	SP = .10 / U = +5	SP = .20 / U = –1
Product B	**High in protein**	**Low in protein**
High in sugar	SP = .15 / U = +3	SP = .10 / U = –4
Low in sugar	SP = .35 / U = +5	SP = .40 / U = –1

and then summing the resulting values across the four cells we obtain the product's subjective expected utility. In the current example, SEU = –0.40 for Product A and SEU = +1.40 for Product B. The consumer would therefore be expected to choose Product B over Product A. Of course, individuals are not thought to actually perform the calculations described by the SEU model. Rather, it is assumed that their decisions can be modeled as if they were performing the stipulated calculations.

In research with the SEU model, subjective probabilities and values are typically not measured. Instead, participants are confronted with decision alternatives and may be provided with the (objective) probabilities of the different possible outcomes (Tversky and Kahneman, 1981). It is assumed that the participants use these probabilities as if they corresponded to their own subjective probabilities, and the underlying decision process is inferred from the choices they make. This "revealed preferences" approach shares some of the shortcomings described earlier with regard to the multi-attribute model: possibly unrealistic product attributes; neglect of inferences beyond the information provided to research participants; inattention to factors other than outcomes of the decision, such as social influence; and difficulties in dealing with choice between very different product categories that involve incompatible attributes or outcomes. In addition, people don't usually structure a choice dilemma such that the outcomes are mutually exclusive and exhaustive. Evaluating all possible attribute combinations creates a heavy cognitive load, especially as the number of attributes increases.

4. The theory of planned behavior

As indicated above, research relying on revealed preferences to infer decision-making processes typically confronts participants with artificial choices

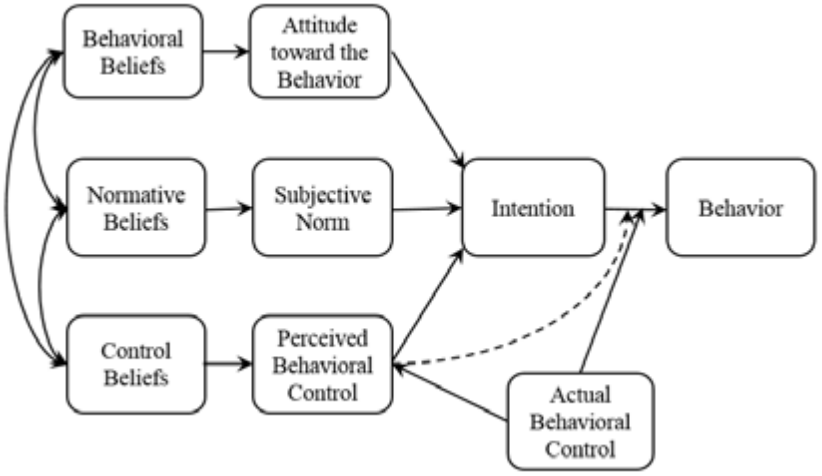
among products or services defined in terms of a selective set of attribute dimensions. Little information is gained about the considerations that actually guide the consumer's behavior. An alternative approach to understanding consumer decision making is provided by the theory of planned behavior (Ajzen, 1991, 2005, 2012). Instead of relying on the overall evaluation or utility of a product or service, this theory focuses on the specific consumer behavior of interest. Examples in the domain of food consumption are "buying low-fat yoghurt," "eating genetically modified food in the next 6 months," and "ordering vegetarian dishes when eating out." The goal of the theory of planned behavior (TPB) is to provide a comprehensive framework for understanding the determinants of such behaviors.

First described in 1985 (Ajzen, 1985), the TPB is today one of the most popular social-psychological models for understanding and predicting human behavior. Briefly, in the TPB, the immediate antecedent of a particular behavior is the "intention" to perform the behavior in question. This intention is assumed to be determined by three kinds of considerations or beliefs. The first is termed "behavioral beliefs" and refers to the perceived positive or negative consequences of performing the behavior and the subjective values or evaluations of these consequences. In their aggregate, behavioral beliefs that are readily accessible in memory lead to the formation of a positive or negative "attitude toward the behavior". A second kind of consideration has to do with the perceived expectations and behaviors of important referent individuals or groups, combined with the person's motivation to comply with the referents in question. These considerations are termed *normative beliefs,* and the normative beliefs that are readily accessible in memory combine to produce a perceived social pressure or *subjective norm* with respect to performing the behavior. The third type of consideration, *control beliefs,* is concerned with the perceived presence of factors that can influence a person's ability to perform the behavior. Together with the perceived power of these factors to facilitate or interfere with behavioral performance, readily accessible control beliefs produce a certain level of perceived behavioral control (or self-efficacy, Bandura, 1977) in relation to the behavior.

As a general rule, the more favorable the attitude and subjective norm with respect to engaging in the behavior, and the greater the perceived control, the more likely it is that a person will form an intention to perform the behavior in question. Finally, intentions are expected to lead to performance of the behavior to the extent that people are in fact capable of doing so, i.e., to the extent that they have actual control over the behavior. Actual behavioral control is thus expected to moderate the effect of intention on behavior. However, in many applications of the TPB, it would be difficult or impossible to identify all the factors that influence actual control over performance of the behavior

in question. For this reason, investigators typically use the measure of perceived behavioral control as a proxy for actual control under the assumption that perceptions of control reflect actual control reasonably well. A schematic representation of the TPB is shown in Figure 2.

Fig. 2. The theory of planned behavior



Not shown in the diagram are feedback loops from behavior to beliefs. Once a behavior is performed, it provides information about consequences, about the reactions of important others, and about the ease or difficulty of performing the behavior. This information is bound to change some of the person's behavioral, normative, and/or control beliefs, thus influencing intentions and future behavior.

Beyond the factors that constitute the theory itself as shown in Figure 2, the TPB recognizes the potential importance of other variables, such as demographic characteristics (age, gender, race, religion, education, income, etc.), personality traits, general attitudes and life values, intelligence, emotions, and so forth. These variables are considered *background factors* in the theory of planned behavior; they are expected to influence intentions and behavior only indirectly by their effects on behavioral, normative, and control beliefs. I present an example with respect to influence of gender on intentions and behavior in Figure 4 below.

It is important to realize that the TPB does *not* assume rationality on the part of the decision maker. The readily accessible beliefs that provide the basis

for attitude toward the behavior, subjective norm, and perceived behavioral control can be poorly informed, reflect unconscious biases, paranoid tendencies, wishful thinking, self-serving motives, or other irrational processes. All we assume in the TPB is that people's intentions and behaviors follow reasonably and consistently from their beliefs no matter how these beliefs were formed. It is only in this sense that behavior is said to be reasoned or planned. Moreover, people are not assumed to go through a careful examination of beliefs every time they perform a behavior. With repetition, behavior becomes routine and is performed without much conscious consideration (see Ajzen & Dasgupta, in press).

5. Behavioral beliefs and attitude toward the behavior

The idea that beliefs form the foundation for our attitudes is embedded in the most popular model of attitude formation and structure, the expectancy-value (EV) model. According to the EV model, we form behavioral beliefs by associating performance of the behavior with certain outcomes. Thus, perhaps as a result of reading a newspaper article, we may come to believe that reducing sugar intake (the behavior) causes a drop in energy but also leads to weight loss, prevents tooth decay, and lowers the chance of developing diabetes (outcomes). Because the outcomes that come to be linked to the behavior are already valued positively or negatively, we automatically and simultaneously acquire an attitude toward the behavior. In this fashion, we learn to form positive attitudes toward behaviors we believe produce mainly desirable outcomes, and we form unfavorable attitudes toward behaviors we associate with mostly undesirable outcomes. Although people can form many different behavioral beliefs, it is assumed that only a relatively small number influence their attitudes in the moment. It is these readily *accessible* beliefs that are considered to be the prevailing determinants of a person's attitude.

Specifically, in the EV model, the subjective value of each accessible outcome contributes to the attitude in direct proportion to the strength of the belief, i.e., the subjective probability that the behavior produces the outcome in question. The way in which behavioral beliefs combine to produce an attitude toward the behavior (A_B) is shown in Equation 2. As can be seen, the strength of each belief (b) is multiplied by the subjective evaluation (e) of the outcome i, and the resulting products are summed. A person's attitude toward the behavior is expected to be directly proportional ($\propto$) to this summative belief composite.

$$A_B \propto \Sigma b_i e_i \tag{2}$$

It is readily apparent that the TPB's expectance-value model is structurally similar to the SEU model of behavioral decision theory shown in Equation 1. There are, however, important differences between the approaches represented by these models. First, the restrictive assumptions of the SEU model are relaxed in that the outcomes in the EV model are neither mutually exclusive not exhaustive and the subjective probabilities (belief strengths) must not sum to one. This greatly reduces the cognitive load for the decision maker: Each outcome simply contributes a single value to the overall belief x evaluation index. Second, because behavioral beliefs are concerned with outcomes that are readily accessible in the research population, these outcomes are not selected by the investigator but are elicited from a representative sample in a free-response format. The most frequently mentioned outcomes are then selected for further research. Finally, the model is tested not in an inference process by examining the choices people make (revealed preferences) but by actually measuring belief strength and outcome evaluation for each outcome. The summed products of the obtained values are then correlated with a direct measure of attitude toward the behavior in accordance with Equation 2. In this fashion, we obtain useful information about the considerations that determine the attitude toward the behavior. An illustration is provided below in Table 4, which shows accessible behavioral beliefs about hunting elicited in a sample of outdoor recreationists.

6. Normative beliefs and subjective norms

We can form "injunctive normative beliefs" by being told or by inferring what important others want us to do or what they would approve or disapprove of, and we can form "descriptive normative beliefs" based on the observed or inferred actions of those social referents (Cialdini *et al*., 1990; Fishbein and Ajzen, 2010). The important others may be one's spouse or partner, close friends, coworkers, or — depending on the behavior — health professionals or teachers. Drawing an analogy to the expectancy-value model of attitude, it is assumed that subjective norm (*SN*) is determined by the total set of accessible injunctive and descriptive normative beliefs. Specifically, the strength of each normative belief (*n*) associated with a given social referent is weighted by motivation to comply (*m*) with the referent in question, and the products are aggregated, as shown in Equation 3. As in the case of the attitude component, normative beliefs and motivations to comply are assessed, and the model is tested by correlating the summed products with a direct measure of subjective norm.

$$SN \propto \Sigma n_i m_i \tag{3}$$

7. Control beliefs and perceived behavioral control

Like attitudes and subjective norms, perceptions of behavioral control are assumed to follow consistently from readily accessible beliefs, in this case beliefs about resources and obstacles that can facilitate or interfere with performance of a given behavior. These may include skills and abilities needed to perform the behavior, the required time and money, cooperation by other people, and so forth. Analogous to the expectancy-value model of attitude, the power of each control factor to facilitate or inhibit behavioral performance contributes to perceived behavioral control in direct proportion to the person's subjective probability that the control factor is present. This model is shown in Equation 4, where *PBC* is perceived behavioral control, c_i is the subjective probability or belief that control factor i is present (strength of control belief), p_i is the power of control factor i to facilitate or inhibit performance of the behavior, and the sum is over the total number of accessible control beliefs. This model is again tested by measuring the strength of each control belief and its perceived power, summing the products of the obtained values, and correlating the summative composite with a direct measure of perceived behavioral control.

$$PBC \propto \Sigma c_i p_i \tag{4}$$

8. Conserving energy: an illustration

A full understanding of the factors that influence intentions and behavior in the context of the TPB requires elicitation and assessment of behavioral, normative, and control beliefs. However, many applications of the TPB make do with a general understanding of the behavior's determinants by obtaining only direct measures of attitude toward the behavior, subjective norm, and perceived behavioral control. A study on energy conservation my students and I conducted a few years ago (Ajzen, Joyce, Sheikh and Gilbert Cote, 2011) can serve as an illustration.

As part of a larger survey, college students completed a TPB questionnaire that included the following measures with regard to energy conservation.

Current energy conserving behavior. The participants were asked to indicate how frequently they performed each of six specific energy saving behaviors, e.g., "walk, ride a bicycle, or take public transportation to work or school," and "turn off electricity and appliances when not in use." In addition, they also responded to two general questions: "Do you make an effort to conserve energy in your daily living?" and "Thinking back over the past few weeks, how

much energy have you been conserving?" Responses to the specific and general questions were highly correlated and were therefore combined into a single index of energy saving behavior, with an alpha reliability coefficient of .77.

Attitude toward conserving energy. Six 7–point evaluative bipolar adjective scales were used to assess attitude toward energy conservation, e.g., "For me to conserve energy this semester would be: very unpleasant – very pleasant." Reponses to the six items were averaged; the alpha coefficient for this measure was .88.

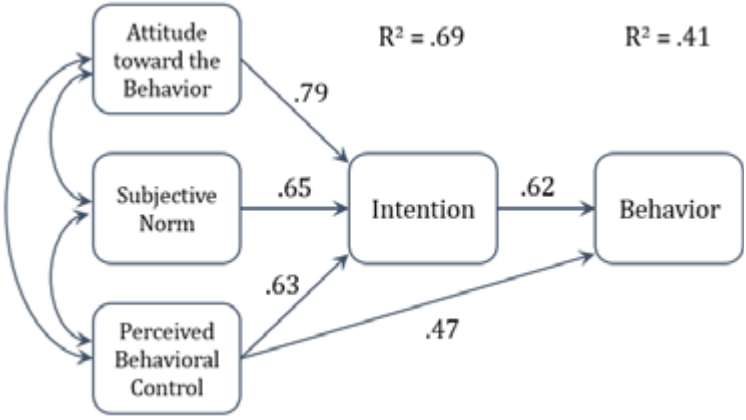
Subjective norm with respect to conserving energy. The mean response to six items was used as a measure of subjective norm, with reliability alpha of .83; e.g., "People who are close to me approve of my conserving energy this semester" (strongly disagree – strongly agree).

Perceived behavioral control over conserving energy. The mean over another set of six items was used to measure perceived behavioral control, e.g., "For me to conserve energy this semester is: completely impossible – definitely possible." The reliability coefficient alpha for this measure was .73.

Intention to conserve energy. Finally, the questionnaire contained six intention items, e.g., "I am planning to conserve energy this semester" (definitely – definitely not), with a reliability of .97.

Figure 3 shows the results of a multiple regression analysis in which intention was regressed on attitude toward the behavior, subjective norm, and perceived behavioral control; and behavior was regressed on intention and

Fig. 3. The TPB applied to energy consumption behavior



perceived behavioral control. All regression coefficients and multiple correlations were statistically significant at $p < .01$. It can be seen, first, that the TPB afforded excellent prediction of intentions to conserve energy, accounting for 69% of the variance, as well as good prediction of reported energy conservation behavior, accounting for 41% of the variance. The regression coefficients show that each of the theory's components made strong contributions to the predictions of intentions and behavior.

9. Predicting food consumption intentions and behaviors

The theory of planed behavior has been applied successfully to study intentions and behavior in a great variety of domains, including food consumption (Fishbein and Ajzen, 2010). Many studies on food consumption stop at the prediction of intentions, but others also collect behavioral data. Table 2 summarizes the results of a sample of TPB studies in this domain. It can be seen that the theory of planned behavior afforded good prediction of various food-related intentions, including intentions to consume soft drinks, fish, and dairy products. In most cases, a person's personal attitude or preference was the strongest predictor of intentions, but an interesting exception occurred in relation to eating a healthy diet (Conner, Norman and Bell, 2002). A healthy diet referred to eating low-fat, high-fiber products, as well as fruit and vegetables. Inspection of the regression coefficients shows that perceived behavioral

Tab. 2. Sample TPB studies on food consumption

Behavior	Regression coefficients				Regression coefficients		
	ATT	SN	PBC	R^2	PBC	INT	R^2
Consume soft drinks (Kassem & Lee, 2004)	.52	.19	.28	.61	—	—	—
East sustainable dairy products (Vermeir & Verbeke, 2008)	.54	.37	.39	.50	—	—	—
Consume fish (Verbeke & Vackier, 2005)	.21	.18	.27	.31	.21	.52	.42
Consume dairy products (Kim, Reicks, & Sjoberg, 2003)	.38	.11*	.30	.42	.22	.49	.39
Eat a healthy diet (Conner *et al.*, 2002)	.31	.02*	.47	.43	.03*	.27	.09

Notes: ATT = attitude toward the behavior, SN = subjective norm, PBC = perceived behavioral control, INT = intention. *not significant; all other coefficients significant at $p < .05$.

control made the strongest contribution to the prediction of intentions to eat a healthy diet. This indicates that anticipating difficulty in maintaining a healthy diet reduced people's intentions to engage in this behavior. Many participants indeed seem to have expected such difficulties, as shown by a relatively low level of perceived behavioral control (M = 1.11 on a 7-point scale scored from -3 to +3, compared with M = 2.04 and M = 1.56 for attitude and subjective norm, respectively). Low perceived control may well reflect a low level of *actual* control, suggested by the finding that intentions accounted for only 9% of the variance in behavior. The other two studies that assessed behavior were much more successful, accounting for 42% of the variance in fish consumption and 39% of the variance in the consumption of dairy products.

10. Consumption decisions in a choice situation

The discussion of TPB research up to this point has focused on prediction of intentions and behavior with respect to a single behavioral alternative: consuming soft drinks, eating a healthy diet, and so forth. Strictly speaking, however, every behavior involves a choice, even if the choice is only between performing the behavior and not performing it. From the perspective of the TPB, each alternative option constitutes a different behavior because the beliefs that are accessible with respect to performing a given behavior may differ considerably from beliefs about not performing it. These considerations imply that we can obtain useful additional information about the considerations that guide a decision by measuring the TPB constructs in relation to each available behavioral alternative.

Support for this idea comes from a study on drinking alcohol and eating junk food (Ajzen and Sheikh, 2013). A questionnaire administered to one sample of college students assessed attitudes, subjective norms, perceptions of behavioral control, and intentions with respect to drinking alcohol and with respect to avoiding alcohol. In a second sample, the questionnaire measured the same TPB constructs in relation to eating junk food and avoiding junk food. When intentions to drink alcohol were regressed on attitudes, subjective norms, and perceived behavioral control regarding alcohol consumption, the TPB accounted for 59% of the variance in intentions. With the addition of attitudes, subjective norms, and perceptions of control in relation to *avoiding* alcohol, the amount of explained variance increased to 67% (change significant at $p < .01$). The results with respect to eating and avoiding junk food were virtually identical.

11. The intention-behavior relation

As is well known, people often fail to act on their intentions, whether they involve regular exercise, completion of tasks on time, or eating a healthy diet. Various factors can account for the intention-behavior gap, including simply forgetting to carry out an intended behavior or changing one's mind (see Fishbein and Ajzen, 2010, Chapter 2 for a discussion). In addition, in the TPB, the effect of intention on behavior is contingent on volitional control: People can be expected to act on their intentions only to the extent that they have sufficient control over the behavior in question. However, as mentioned earlier, because it is often difficult to know how much control people actually have in relation to a given behavior, investigators often rely on perceived behavioral control as a proxy for actual control.

In the TPB research reviewed earlier, intentions and perceptions of control were combined additively to predict behavior despite the fact that, according to the theory, their effect on behavior should be modeled as an interaction. The linear combination has been used because, once intention and perceived control are taken into account, the interaction between these two variables usually accounts for little or no additional variance in behavior. However, there is evidence to show that the effect of intentions on behavior is in fact moderated by perceived behavioral control, evidence coming from the domain of food consumption (Papies *et al.*, 2008). In this study on restrained eating, the authors provided evidence for the effect of perceived control on the ability of intentions to predict eating behavior. The participants expressed their intentions *not* to eat Pizza, chocolate, cookies, French fries, and chips ("junk food"), and they indicated their perceived level of control by rating how successful they were in losing weight, watching their weight, and staying in shape. Among participants with a weight-loss goal, intentions to avoid "junk food" predicted reported avoidance of these foods much better when the participants had a high (r = .90) as compared to a low (r = .27) level of perceived control over losing weight[1] (see also Schifter & Ajzen, 1985).

12. Background factors

As noted earlier in the description of the theory of planned behavior, variables not dealing directly with the behavior of interest are treated as background factors that may have an effect on intentions and behavior indirectly

[1] I am grateful to Wolfgang Stroebe for providing these correlation coefficients, which were not reported in the published article.

by influencing one or more of the TPB predictors. A study on hunting (Daigle *et al.*, 2002; Hrubes *et al.*, 2001) allows us to examine the effect of gender on intentions and behavior. In this study, outdoor recreationists completed a TPB questionnaire with respect to hunting in the next 12 months and, a year later, they were contacted again and asked how often they had gone hunting during the previous year. Based on a reanalysis of the data, Table 3 reveals marked differences between men and women. Compared to women, men reported much stronger attitudes, subjective norms, perceived behavioral control, and intentions in favor of hunting, and they also reported engaging in this behavior much more frequently.

Tab. 3. Mean gender differences in TPB constructs related to hunting

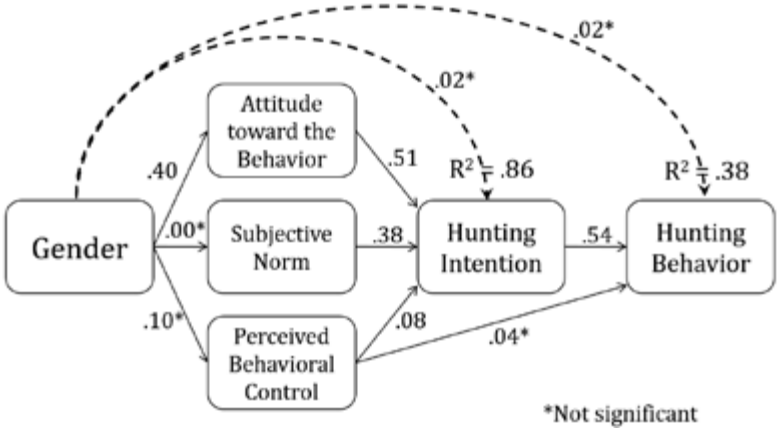
TPB construct	Men	Women
Attitude	1.00	-2.06
Subjective norm	0.61	-1.92
Perceived behavioral control	1.28	-1.19
Intention	0.53	-2.60
Hunting frequency	13.04	0.61

Notes: TPB predictors are scored from -3 to +3; all mean differences between men and women are significant at $p < .01$.

In Figure 4, gender is modeled as a background factor in the theory of planned behavior. It can be seen, first, that the TPB predictors accounted for fully 86% of the variance in hunting intentions, and they explained 38% of the variance in reported hunting behavior over a one-year period. Attitudes and subjective norms had significant effects on intentions, and intentions predicted hunting behavior. Perceived behavioral control did not make significant contributions to these predictions.

The figure also shows that, consistent with the TPB, gender had no significant direct effect on intentions or on behavior; its effects were mediated only by attitudes toward hunting, not by subjective norms or perceptions of control. According to the TPB, these attitudes are based on behavioral beliefs regarding the perceived consequences of hunting behavior and the subjective evaluations of these consequences (Equation 2 above). Readily accessible outcomes of hunting had been elicited in a pilot study. Table 4 shows the 12 most frequently mentioned outcomes. With respect to each outcome, the TPB questionnaire as-

Fig. 4. The effect of gender on hunting intention and behavior



sessed the perceived likelihood that hunting will lead to the outcome and the respondent's evaluation of the outcome. In support of the expectancy-value model of attitude, the summed belief strength x outcome evaluation composite was found to have a correlation of .76 ($p < .01$) with the direct attitude measure.

The data presented in Table 4 help us understand the reasons for the different attitudes toward hunting among men and women. It can be seen that there

Tab. 4. Gender differences in behavioral beliefs about hunting

	Belief strength		Outcome evaluation	
Behavioral belief	Men	Women	Men	Women
Viewing scenery and enjoying nature	1.65	−0.40*	2.64	2.77
Observing and learning about wildlife	1.83	0.48*	2.42	2.20
Feeling tired and exhausted	0.22	−0.58*	0.01	−0.03
Creating or maintaining significant relationships with family or friends	1.10	−0.79*	2.64	2.77
Relaxing and relieving stress	1.39	−1.00*	1.66	2.77*
Getting exercise and staying in shape	1.34	−0.48*	2.55	2.79*
Feeling a sense of competence	1.19	−0.56*	2.39	2.67*
Experiencing solitude, time to think	1.70	−0.08*	2.52	2.65
Getting dirty, wet, or cold	1.49	0.68*	−0.03	0.06
Feeling a sense of belonging and familiarity with nature	1.35	−0.23*	2.41	2.58
Experiencing excitement	1.86	0.04*	2.45	2.28
Seeing wounded or dead animals	1.31	1.59	−1.15	−1.89*

Note. Belief strength and outcome evaluation scored from −3 to 3.
*Difference between men and women significant at $p < .05$.

were actually few significant gender differences with respect to outcome evaluations. Most of the readily accessible outcomes of hunting – whether viewing scenery and enjoying nature, observing and learning about wildlife, or experiencing solitude and time to think – were judged to be highly favorable by both men and women. The major gender differences had to do with the subjective probabilities that hunting would produce the various outcomes. Generally speaking, women were significantly less likely than men to believe that hunting leads to favorable outcomes. For example, they thought it much less likely that hunting allows you to view scenery and enjoy nature, relaxes and relieves stress, or produces a sense of belonging and familiarity with nature.

In short, for reasons not explored in this study, men by and large believed more strongly than women that hunting leads to positive outcomes. Consequently, they held more favorable attitudes toward this behavior and, because attitudes were the primary determinants of hunting intentions, men also formed stronger intentions to go hunting and actually hunted more frequently.

13. Conclusions

In this article, I tried to show that the theory of planned behavior can help predict and explain consumer intentions and behavior. The TPB goes beyond product attributes – the focus of the multi-attribute and subjective expected utility models – to consider not only attitudes toward choice alternatives but also the influence of perceived social norms and behavioral control. In addition, the TPB can accommodate decisions involving purchase of a single product, different brands of the same product, or choice among very different products. Furthermore, by eliciting readily accessible behavioral outcomes, normative referents, and control factors, application of the TPB permits us to directly measure the considerations that guide consumer decisions. The TPB also allows us to incorporate various background factors, such as age or gender, into the model and to test the mediated influence of these factors on intentions and behavior. Finally, once the theory's predictive validity has been confirmed, the information obtained can be used to design effective behavior change interventions.

References

Ajzen I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2): 179-211. doi: 10.1016/0749-5978(91)90020-T

Ajzen I. (2005). *Attitudes, personality, and behavior* (2nd ed.). Maidenhead, UK: Open University Press.

Ajzen I. (2012). The theory of planned behavior. In P. A. M. Lange, A. W. Kruglanski & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (Vol. 1, pp. 438-459). London, UK: Sage.

Ajzen I., Dasgupta N. (in press). Explicit and implicit beliefs, attitudes, and intentions: The role of conscious and unconscious processes in human behavior. In B. Eitam and P. Haggard (Eds.), *Human agency: Functions and mechanisms*. New York: Oxfold University Press.

Ajzen I., Joyce N., Sheikh S., Gilbert Cote N. (2011). Knowledge and the prediction of behavior: The role of information accuracy in the theory of planned behavior. *Basic and Applied Social Psychology*, 33(2): 101-117. doi: 10.1080/01973533.2011.568834

Ajzen I., Sheikh S. (2013). Action versus inaction: Anticipated affect in the theory of planned behavior. *Journal of Applied Social Psychology*, 43(1): 155-162. doi: 10.1111/j.1559-1816.2012.00989.x

Bandura A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2): 191-215.

Cialdini R.B., Reno R.R., Kallgren C.A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58(6): 1015-1026.

Conner M., Norman P., Bell R. (2002). The theory of planned behavior and healthy eating. *Health Psychology*, 21(2): 194-201.

Daigle J.J., Hrubes D., Ajzen I. (2002). A comparative study of beliefs, attitudes, and values among hunters, wildlife viewers, and other outdoor recreationsists. *Human Dimensions of Wildlife*, 7: 1-19. doi: 10.1080/108712002753574756

Edwards W. (1954). The theory of decision making. *Psychological Bulletin*, 51: 380-417.

Edwards W., Fasolo B. (2001). Decision technology. *Annual Review of Psychology*, 52: 581-606. doi: 10.1146/annurev.psych.52.1.581

Fishbein M., Ajzen I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York: Psychology Press.

Goldstein W.M., Hogarth R.M. (1997). Judgment and decision research: Some historical context. In: W.M. Goldstein and R.M. Hogarth (Eds.), *Research on judgment and decision making: Currents, connectionc, and controversies*. Cambridge, UK: Cambridge University Press.

Hrubes D., Ajzen I., Daigle J. (2001). Predicting hunting intentions and behavior: An application of the theory of planned behavior. *Leisure Sciences*, 23(3): 165-178. doi: 10.1080/014904001316896855

Kassem N.O., Lee J.W. (2004). Understanding soft drink consumption among male adolescents using the theory of planned behavior. *Journal of Behavioral Medicine*, 27(3): 273-296.

Kim K., Reicks M. and Sjoberg S. (2003). Applying the Theory of Planned Behavior to Predict Dairy Product Consumption by Older Adults. *Journal of Nutrition Education and Behavior*, 35(6): 294-301. doi: 10.1016/S1499-4046(06)60343-6

Papies E.K., Stroebe W. and Aarts H. (2008). Healthy cognition: Processes of self-regulatory success in restrained eating. *Personality and Social Psychology Bulletin*, 34(9): 1290-1300. doi: 10.1177/0146167208320063

Peterson C.R., Beach L.R. (1967). Man as an intuitive statistician. *Psychological Bulletin*, 68(1): 29-46.

Schifter D.E., Ajzen I. (1985). Intention, perceived control, and weight loss: An application of the theory of planned behavior. *Journal of Personality and Social Psychology*, 49(3): 843-851.

Shafir E., LeBoeuf R.A. (2002). Rationality. *Annual Review of Psychology*, 53(1): 491-517.
Tversky A., Kahneman D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481): 453-458.
Verbeke W., Vackier I. (2005). Individual determinants of fish consumption: Application of the theory of planned behaviour. *Appetite*, 44(1): 67-82. doi: 10.1016/j.appet.2004.08.006
Vermeir I., Verbeke W. (2008). Sustainable food consumption among young adults in Belgium: Theory of planned behaviour and the role of confidence and values. *Ecological Economics*, 64(3): 542-553. doi: 10.1016/j.ecolecon.2007.03.007