Exploring Pro-environmental Behaviors of Consumers: An Analysis of Contextual Factors, Attitude, and Behaviors

Abstract: By including the context within which consumers' pro-environmental attitudes and behaviors are formed, this research provides a comprehensive delineation of the process that leads from context to behavior. This is the first study to examine context factors as subjective perceptions made by consumers about aspects of their own situation, specifically the extent to which they perceive having more or less time, money, and power available. In contrast to previous research considering one type of behavior (such as recycling), this study recognizes pro-environmental behavior as a heterogeneous, multi-dimensional construct, and includes both public and private sphere behaviors. Pro-environmental business managers and policy-makers may not be in a position to impact objective contextual factors that consumers face, however, they may influence perceptions and attitudes. This study identifies specifically which variables may be of more interest to modulate, so as to increase pro-environmental behavior.

Keywords: Pro-environmental behavior; pro-environmental attitude; consumer behavior; contextual factors; mediation analysis; structural equation modeling

1. Introduction

Pro-environmental behavior (PEB) refers to "behavior that harms the environment as little as possible, or even benefits the environment" (Steg & Vlek, 2009, p.309). Past research noted that contextual factors might impede PEB (Stern, 1999, 2000). Specifically, the lack of time, cost, and actual effort that the consumer is capable of performing, may be crucial hindrances to pro-environmental consumption choices (Grimmer, Kilburn and Miles, 2015; Young et al., 2010). Furthermore, Steg and Vlek (2009) postulated that the relationship between contextual factors and PEB might be mediated by intra-psychic factors such as attitudes, values, or beliefs.

This study answers calls in the literature for research on the impact of contextual factors on PEB (e.g., Steg and Vlek, 2009; Steg et al., 2014; Grimmer, Kilburn and Miles, 2015). Specifically, we set out with two goals: our first goal is to investigate the factors that underlie attitude toward PEB and determine the antecedents and impacts of attitude on PEB. Our second goal is to examine the direct effect of contextual factors on PEB, as well as their indirect effects through attitude variables. We provide empirical support to the proposition of a mediational mechanism between contextual factors and PEB, which could further explain the attitude-behavior gap or values-action gap.

This study contributes to the literature on PEB in three ways. First, by including the context within which pro-environmental attitudes and behaviors are formed, we provide a comprehensive delineation of the process that leads from context to behavior. For the first time, we examine context factors as subjective perceptions made by consumers about aspects of their own situation, specifically the extent to which they perceive themselves as having more or less time, money, and power (control). Second, in contrast to past research, which has generally considered one type of behavior (e.g., recycling), this research recognizes PEB as a heterogeneous, multi-

dimensional construct including both public and private sphere behaviors. Private sphere PEB refers to "the purchase, use, and disposal of personal and household products that have environmental impact" (Stern, 2000, p. 409-410) such as using automobiles, public transportation, or recycling. Conversely, public sphere PEB is defined as behavior that affects the environment directly through committed environmental activism (e.g. active involvement in environmental organizations and demonstrations) or indirectly by influencing public policies (e.g. petitioning on environmental issues) (Stern, 2000, p.409). Third, we employ structural equation modeling (SEM) which permits simultaneous analysis of all the variables in the model and measurement of direct and indirect effects. To the best of our knowledge, this is the first study that considers both private and public PEB, as well as perceived context based on aspects of consumer's own situation to delineate the relationship between PEB, context, and attitude, using both SEM and regression-based mediation analysis.

This research centers on the question of what drives PEB and how it can be influenced, and as such, it carries implications for researchers, social scientists, ecologists, business managers, and policy makers. Specifically, this research advances theory by describing the mechanism through which contextual factors impact PEB. Pro-environmental business managers and policy-makers may not be in a position to impact objective contextual factors that consumers face, although, they may influence perceptions and attitudes. This study identifies specifically which variables may be of more interest to modulate in order to increase PEB.

2. Past research

Table 1 summarizes past research that sought to predict PEB by examining different sorts of variables. Two sets of causal variables were particularly identified. The first relate to intra-personal factors, such as attitudes, norms, motivations, and values, for predicting PEB "from

within" (Noppers, Keiser, Bolderdijk and Steg, 2014; Poortinga, Steg and Vlek, 2004). In this category, the Theory of Planned Behavior has been the most influential framework. The second set of causal variables are objective contextual factors which explain PEB "from without." Several studies stressed that individuals are not only driven by intra-psychic elements, but also by contextual or situational factors (e.g. interpersonal influences, government regulations, availability of recycling facilities, quality of public transport, pricing regimes), which may hinder or facilitate PEB. These two sets of studies offer valuable insights, however, examination of intra-personal factors alone over-emphasizes the consumer at the expense of their environment (e.g. Stern, 2000; Steg and Vlek, 2009), whereas exclusive focus on contextual factors increases the importance of the environment at the expense of individual willpower.

A more promising approach resides in the integrated and simultaneous consideration of different sets of predictor variables influencing PEB, especially from both the intra-personal and contextual aspects (Clark, Kotchen and Moore, 2003; Steg and Vlek, 2009; Stern, 1999, 2000; Heath and Gifford, 2002; Guagnano et al., 1995; Kollmuss and Agyeman, 2002; Corraliza and Berenguer, 2000). In addition to the examination of direct effects, an integrated approach also permits exploration of interaction effects between variables from different predictor aspects on PEB. The examination of both attitudinal and contextual factors and their interaction on PEB has been particularly advocated in previous studies (Stern, 1999, 2000; Steg and Vlek, 2009). Contextual factors may stimulate motivational factors, which may in turn lead to an increase in the behavior (Geller, 1995). Our study contributes to this third body of literature by drawing precisely on the potential to combine intra-personal and contextual factors and their interactions to examine both what drives PEB, and how it can be influenced.

Table 1 about here

3. Conceptual framework

According to Lewin's (1939, 1951) field theory, consumers evolve in a "Life Space" (LS), which is the product of their actual "Environment" (E), i.e., the objective context or situation that they perceive and in which they behave, and "person" (P), i.e., "the individual's perception of his relations to the environment he perceives" (Deutsch, 1954, p.412). The resulting "life space environment" is a purely mental or psychological representation that the consumer makes of the external and objective reality. Thus, objective contextual factors (i.e. life space) in previous studies (e.g. Guagnano et al., 1995; Hunecke et al., 2001; Fuji and Kitamura, 2004) cease to be objective as soon as individual perceptions come into play. Hence, contextual factors remain essentially *perceived* by consumers, as expressed in the perceived behavioral control variable (Steg and Vlek, 2009; Ajzen, 1985, 1991). Through this study, we contribute to this theoretical framework by considering contextual factors from a perceptual viewpoint.

We draw upon the ABC theory, or Attitude-Behavior-Context theory (Stern, 2000; Guagnano et al., 1995; Stern et al., 1999), which capitalizes on the Lewinian idea that "behavior (B) is an interactive product of personal sphere attitudinal variables (A) and contextual factors (C)" (Stern, 2000, p.415). This theory has several advantages in this regard. First, the ABC theory has been specifically developed in the domain of environmental studies and is thus adequately applicable to predict PEB. Second, it subsumes more than thirty years of research (Guagnano et al., 1995; Stern, 2000; Stern et al., 1999; Black et al., 1985; Stern and Oskamp, 1987; Dietz et al., 1998), and captures therefore the evolving nature of PEB. Third, it provides a flexible framework which facilitates further development. Capitalizing on this, we build on the ABC theory by incorporating subjectively perceived contextual factors, as well as their interaction on PEB. Attitudinal variables may include personal beliefs, norms, values, and pre-dispositions to behave

in a pro-environmental manner. Contextual factors, on the other hand, include objective factors such as monetary incentives, costs, regulations, public policy, or norms, as well as subjectively perceived factors, such as perceived resources available (Olli et al., 2001).

3.1. Behavior

Past research has primarily measured PEB as a one-dimensional construct and emphasized PEB that occurs within the private sphere as they are relevant to most consumers and have direct environmental consequences, such as recycling, using public transportation, and eco-friendly purchasing. Another type of PEB that have generated interest are those focused on civic engagement, commonly referred to as 'environmental citizenship.' These are pro-environmental actions in the socio-political arena, including behaviors such as involvement in an environmental group, or participation in a demonstration or protest related to environmental issues.

Researchers are increasingly recognizing the heterogeneous nature of PEB for a number of reasons (Larson, Stedman, Cooper and Decker, 2015; Lee, Kim, Kim and Choi, 2014). Firstly, participation levels in PEB are influenced by various social and structural factors (Larson et al., 2015). For example, consumers can easily use reusable grocery bags, but their participation in environmental activities (e.g. tree-planting, attending environmental protests) may be limited by opportunities, which may be few or nil. Secondly, participation in PEB may be influenced by different types of goals: hedonic, gain, or normative (Stern, 2000; Steg et al., 2014), which in turn may result in different rates of behavioral engagement, and influence the way people perceive actions and their environmental impacts. Thirdly, PEB varies in terms of type of impacts, e.g., direct vs. indirect (Poortinga, Steg and Vlek, 2004; Stern, 2000) and scope of influence, e.g., local to global. For instance, recycling may produce long-term benefits such as reductions in global greenhouse gas emissions, while participating in environmental protests in a

local community may immediately generate more significant ecological impacts, but on smaller scales. Although low rates of participation in environmental citizenship behaviors are common in the PEB literature (Oreg & Katz-Gerro, 2006; Stern, 2000), because of their unique impact through influence on formal policy, decision- making and social norms, these actions may have a powerful effect since public policies can change behaviors of many people and organizations at once. Therefore, effective measures of PEB should include various forms of civic engagement as well as the more common private sphere behaviors. The current study recognizes PEB as a multi-dimensional construct and considers both private sphere and environment citizenship behaviors, the latter of which will be henceforth referred to as public sphere behavior.

3.2 Context

Many contextual variables may come into play when attempting to predict PEB. The ABC theory focuses on a specific set of perceived contextual factors which are most prominently expected to interact with attitudes to influence PEB (Stern, 2000; Guagnano et al., 1995; Steg and Vlek, 2009; Dietz et al., 1998; Grimmer et al., 2015). These variables include perceived busyness, perceived wealth, and perceived power. Busyness (i.e. time) and wealth have the potential to generalize across all PEBs hence are useful for measuring a consumer's environmental context in a systematic manner (Guagnano et al., 1995). Furthermore, they appear important in explaining low levels of PEB as they may prohibit consumers from taking action (Steg and Vlek, 2009). Power is a similarly important construct in explaining lower behavioral enactment (Stern, 2000).

Perceived busyness refers to the consumer's perception of the availability of time to act (Stern, 2000). The more time available to consumers to act environmentally, the more they will act environmentally (Dietz et al., 1998; Grimmer et al., 2015). Indeed, consumers deeply

engaged in local consumption schemes (i.e. negotiating pricing, crops cultivation and delivery), do so at a considerable temporal cost (Dubuisson-Quellier and Lamine, 2008). Similarly, recycling implies extra effort which may increase consumers' perception of time required to perform the behavior (Vining and Ebreo, 1992). Consequently, actual enactment of PEB is contingent on consumers' perception of time available to them. Perceived wealth hints at the monetary resources available to the consumer (Stern, 2000). It was shown that PEB depends on individuals' economic resources (Stern et al., 1999; Clark et al., 2003). The higher consumers' disposable income, the more likely they are to engage in PEB (Grimmer, Kilburn and Miles, 2015). Some PEBs cost more than conventional products, such as local or green products (Dubuisson-Quellier and Lamine, 2008), and home energy-saving devices (Black et al., 1985). Finally, perceived power is a psychological state (Anderson et al., 2012), which can be defined as the perception about one's capacity to enact a certain behavior.

According to the ABC theory, these three contextual factors are positively related to PEB, because when they are strongly positive or negative, they effectively compel or prohibit the PEB (Stern, 2000; Guagnano et al., 1995; Lee et al., 2014). Thus:

H1a: Consumers' perception of lesser busyness (i.e. more time available) has a positive relationship with their pro-environmental behavior (private-sphere behavior and public-sphere behavior).

H1b: Consumers' perception of wealth (money available) has a positive relationship with their pro-environmental behavior (private-sphere behavior and public-sphere behavior).

H1c: Consumers' perception of power has a positive relationship with their pro-environmental behavior (private-sphere behavior and public-sphere behavior).

In contrast to other theoretical models which seek to explain PEB, such as the Theory of Planned Behavior (TPB) and the Value-Belief-Norm theory, ABC theory has the potential to uniquely combine contextual factors (objective or perceived) with a central intra-psychic variable, namely the attitudes (Guagnano et al., 1995). Thus it offers the potential to provide a thorough account of PEB's antecedents and how both persons and environment interact. The current study also relates the way in which the three variables of perceived context (busyness, wealth, and power) interact with the intra-psychic variable of attitudes, which by symmetry we define as attitudes toward duration, cost, and importance.

According to ABC theory, personal behaviors that are not strongly regulated (i.e. by not being required or rewarded) – such as PEB – the perception of contextual variables directly affects attitudes (Stern, 2000; Guagnano et al., 1995; Stern et al., 1999; Black et al., 1985). This is congruent with psychological theory, which posits that beliefs or perceptions have a strong effect on attitudes (Ajzen, 1985, 1991). Further, Steg and Vlek (2009) posited the perceptions-attitudes relationship as one of the most important ways in which contextual variables may operate to influence PEB. In our context, the more time, money, and power consumers perceive to have in order to enact a certain PEB, the more strongly these contextual variables will impact positively attitudinal variables toward the duration, cost, and importance of the PEB respectively. Thus:

H2a: Consumers' perception of lesser busyness has a positive relationship with attitude toward PEB (importance, duration, and cost).

H2b: Consumers' perception of wealth has a positive relationship with attitude toward PEB (importance, duration, and cost).

H2c: Consumers' perception of power has a positive relationship with attitude toward PEB (importance, duration, and cost).

3.3. Attitude

ABC theory predicts that attitudes reflect the types of predispositions underlying the desire to act with pro-environmental intent and that they can therefore influence the occurrence of PEB (Stern, 2000). In contrast to other models (e.g. TRA, TPB), in which attitudes first influence intentions, which in turn influence behavior (Ajzen, 1985, 1991), the ABC theory asserts that attitudes impact behavior directly (Steg and Vlek, 2009; Geller, 1995). Empirical studies provide evidence for a direct and positive relationship in the domain of environmental behavior (Stern et al., 1999); Grob, 1995; Black et al., 1985).

Attitudes predispose the consumer to act in a certain way (Stern, 2000). Therefore, pre-existing tendencies to consider the PEB favorably leads to a higher propensity to actually perform PEB. More specifically, we propose that whenever consumers consider the PEB as more important, less costly, and less time-consuming, this will facilitate their proclivity to enact PEB.

Given our focus on the contextual variables of busyness, wealth, and power, we use corresponding attitudinal variables, consisting respectively of attitudes toward duration, cost, and importance of the behavior. We consider attitudes as behavior-specific beliefs. Therefore, 'importance' refers to the extent to which the PEB is a priority for the consumer (Stern, 2000). Duration refers to the consumer's appreciation of the amount of time that would necessitate a specific environmental behavior. Cost refers to the consumer's appreciation of the amount of money that would either be saved or spent through a specific environmental behavior. Thus:

H3a: Consumers' attitude toward importance of PEB has a positive relationship with their pro-environmental behavior (private-sphere behavior and public-sphere behavior).

H3b: Consumers' attitude toward the duration of PEB has a positive relationship with their pro-environmental behavior (private-sphere behavior and public-sphere behavior).

H3c: Consumers' attitude toward the cost of PEB has a positive relationship with their pro-environmental behavior (private-sphere behavior and public-sphere behavior).

3.4. Interaction between contextual and attitudinal factors

ABC theory elaborates on the Lewinian truism that behavior is a function of organism and environment (Guagnano et al., 1995; Stern et al., 1999). It provides a concrete framework regarding the manner in which causal factors may interact to predict PEB, which is important because studies examining only main effects can at times be strongly misleading (Stern, 2000).

According to ABC theory, for personal behavior that is based on goodwill, the more or less time-consuming, expensive, or difficult the behavior is perceived to be, the stronger its dependence on attitudinal factors, such as attitudes, to explain PEB (Stern, 2000; Guagnano et al., 1995; Stern et al., 1999; Black et al., 1985). Many PEBs are not obligatory and depend on consumers' goodwill (Saphores et al., 2012). Therefore, contextual factors and attitudes interact such that contextual variables not only affect PEB directly, but they also influence PEB indirectly through their interaction with attitudes (Steg and Vlek, 2009). Thus:

H4a: The impact of contextual factors (perceived busyness, wealth, and power) on PEB (private-sphere behavior, and public-sphere behavior) is mediated by importance.

H4b: The impact of contextual factors (perceived busyness, wealth, and power) on PEB (private-sphere behavior, and public-sphere behavior) is mediated by duration.

H4c: The impact of contextual factors (perceived busyness, wealth, and power) on PEB (private-sphere behavior, and public-sphere behavior) is mediated by cost.

The conceptual model is depicted in Figure 1.

Figure 1 about here

4. Method

4.1. Data collection

The questionnaire was first pre-tested on a group of 120 students in a Canadian university. The pre-test helped determine the set of PEB included in the study, confirm validity of the constructs, and shorten the survey. The data was gathered via Amazon Mechanical Turk (MTurk) using an online survey design. Respondents had to be residents of the US, over 18 years of age, and supporting themselves financially (i.e. paying for their own food, rent/mortgage, transportation). A total of 400 consumers participated in the study. We inferred that most respondents were actively engaged in the survey basing on their unprompted lengthy comments to the last question on the questionnaire "Do you have any feedback concerning the survey". We did not have to drop any subject for taking too little or too long to complete the survey.

4.2. Measurement

Five private-sphere items were included: 1) Using reusable shopping bags; 2) Eating locally grown food; 3) Recycling; 4) Commuting by bike, walking, or public transit; and 5) Purchasing eco-friendly cleaning products. Frequency of behavior was measured using the question "What percentage of the time do you do each of the following? (Choose the closest option)." The answers were measured on a 7-item scale comprising: 0-5%, 6-20%, 21-35%, 36-50%, 51-65%, 66- 80%, and 95-100%. Three items measured public-sphere behavior: 1) Attend environmental protests; 2) Participate in environmental activities (e.g. tree-planting, picking-up litter); and 3) Share posts about the environment on social media. They were measured on a 7-item scale which comprised of: never, less than once every 5 years, once every few years, roughly once a year, more than once a year, once every few months, and once a month or more.

Perceived busyness and perceived wealth were each measured by a four-item seven-point Likert scale. Busyness items included: 1) I am a busy person; 2) I have less time on my hands

than the average person; 3) I feel like I am rushing too often; and 4) I have very little free time. Wealth items included: 1) I am wealthy; 2) I always have enough money to make ends meet; 3) I own a lot of money; and 4) I can afford to purchase nice things. Perceived power was assessed by "I am currently in a position where I can decide whether or not to do this behavior" corresponding to each PEB on a seven-point strongly disagree-strongly agree Likert scale.

4.3. Validity and reliability

A Confirmatory Factor Analysis (CFA) (EQS 6.2) with all the scales in the model was performed in order to assess measurement quality. Indicators with factor loadings less than .4 were excluded. Item 4 ("Commuting by bike, walking, or public transit) in the "cost" construct displayed a low factor loading (.372) and was therefore deleted. The low factor loading may have resulted from unequal access to public transit. In order to ensure symmetry, item 4 was likewise deleted from all other constructs. The measurement model shows acceptable fit ($S-B\ \chi^{2}_{(823)}$ = 2075.2063, P = .000; Comparative Fit Index [CFI] = .95; Root Mean Square Error of Approximation [RMSEA] = 0.06) and adequate factor loadings. Fit indices satisfy Hu and Bentler's (1998) recommendations for model fit using EQS. Common Method Bias (CMB) was controlled for, a priori, by randomizing questions and rotating items. CMB was further controlled for, a posteriori, through Harman's single-factor test, which indicated absence of CMB. Table 2 displays the psychometric properties of the measures.

Table 2 about here

Discriminant validity was examined through a pairwise restriction of models (Anderson & Gerbing, 1988). The correlation between each pair of constructs was fixed to 1.0 and a test of significance of chi-square change was performed. All chi-square changes were significant.

5. Analysis and results

5.1. Effects of context and attitude on behavior

The aggregate structural model (EQS 6.2) yielded appropriate fit ($S-B\ \chi^{2}_{(840)}$ = 2370.3578, CFI = .92, RMSEA = 0.06). Table 3 shows that both the context-attitude relationship and the attitude-behavior relationship are significant, whereas the context-behavior relationship is not. These results demonstrate preliminary evidence of a potential mediation effect in which context is not directly related to behavior unless attitude is taken into account.

Table 3 about here

5.2. Mediation test

A bootstrap mediation test (Preacher and Hayes, 2008; Hayes, 2013) tested matching of the criteria justifying mediation effects. The bootstrap method is useful to overcome non-normality that is encountered during interaction effect analyses, because the indirect effect is the product of two parameters *a* and *b* (Preacher and Hayes, 2008; Zhao et al., 2010; Labrecque et al., 2012). Both direct and indirect effects were computed using the PROCESS macro (released January 2016). Prior to the analysis, all continuous predictors were well centered.

Table 4 about here

5.3. Antecedents of mediators

As shown in Table 4, perceived busyness is positively related to attitude toward importance, duration and cost. Perceived wealth is positively related to attitude toward importance and cost, but not duration. Perceived power is positively related to attitude toward duration, but not to cost and importance. Collectively, these results lend full support to H2a, and partial support to H2b-c.

5.4. Effects of mediators on behavior

Importance is significantly related to both private sphere behavior and public sphere behavior, with perceived busyness, wealth, and power included as independent variables. Duration is not significantly related to private-sphere behavior or public behavior, with perceived busyness, wealth, or power included as independent variables. Cost is significantly related to both private sphere behavior and public sphere behavior, with perceived busyness, wealth, and power, included as independent variables. These results confirm H3a and H3c but not H3b.

5.5. Mediation test

The independent variable should be related to the mediator variable, and the mediator variable to the dependent variable (Preacher and Hayes, 2008). Then, full mediation occurs when a non-significant Direct Effect (DE) from the independent variable to the dependent variable (c path) is present with a significant indirect path (ab path); partial mediation takes place when both the Indirect Effect (IE) and the Direct Effect (DE) are significant (Zhao et al., 2010; Labrecque et al., 2012). An IE is significant when its confidence interval does not cross zero (Sperry and Widom, 2013). The indirect effect reflects the amount by which the total effect of the independent variable (i.e. perceived busyness, wealth, and power) is decreased when the mediator (i.e. importance, duration, and cost) is introduced in the analysis (Sperry and Widom, 2013). For the sake of conciseness, the details about the indirect effect pertaining to each mediator are not included in Table 4 but are discussed subsequently.

The results of the mediation test lend partial support to H1a-c. Most importantly, H4a is partially supported given that importance mediates the path from perceived busyness and wealth (but not power) to both private-sphere behavior and public-sphere behavior. Similarly, H4c is partially supported because cost mediates the path from perceived busyness and wealth (but not

power) to both private-sphere behavior and public-sphere behavior. H4b is invalidated since duration does not mediate any of the relationships between contextual factors and PEB variables.

The non-significant direct effects of perceived busyness and wealth on private-sphere behavior lend support to the conclusion that the effect of perceived busyness and wealth on private behavior is achieved through attitude toward importance and cost. Both importance and cost fully mediate the relationship, which means that the positive effect of perceived busyness and wealth on private behavior can be fully explained by attitudes toward importance and cost of PEB. On the other hand, importance and cost only partially explain the effect of perceived busyness and wealth on public behavior. In contrast, duration does not at all mediate the positive effect of perceived busyness and wealth on either private or public behavior, whereas perceived power directly explains private sphere behavior but not public behavior.

5.6. Alternative model

We examined alternative configurations of the interactions of our theoretical constructs. Geller (1995) proposed that instead of mediating the relationship between context and behavior, the focus should be shifted to an intra-personal one, in which the attitude-behavior relationship is moderated by contextual factors. We used the PROCESS macro (January 2016) developed by Hayes (2013) on 5000 resamples and found that although some significant moderation effects do exist, their effect is not substantial, ranging from |.0061| to |.0194|. In contrast, significant mediation effects range from |.125| to |.494|, which rule out a moderation configuration.

6. **Discussion**

This study answers calls in the literature for research on the impact of contextual factors on PEB (e.g., Poortinga, Steg and Vlek, 2004; Steg and Vlek, 2009; Grimmer, Kilburn and Miles, 2015). Specifically, we examined the impact of perceived contextual factors on PEB.

6.1. Theoretical implications

In line with an emerging stream of research (Stern, 2000; Guagnano et al., 1995; Carrington et al., 2010; Atkinson and Rosenthal, 2014), we empirically support Steg and Vlek's (2009) postulation that for assessing PEB considering subjectively perceived contextual factors, in addition to intra-personal factors, is a more fruitful approach as opposed to using either objective contextual factors or intra-personal factors exclusively.

The findings of this study lend support to a positive full indirect effect of perceived busyness and wealth on private sphere PEB through importance and cost, but no indirect effect of perceived power on either public or private behavior. This result is in line with classic TPB framework, since perceived control (i.e. perceived behavioral control) is linked both directly and indirectly to behavior (Ajzen, 1985, 1991). This study also makes a strong statement that perceived power is a direct antecedent to PEB if it is performed privately, such as recycling. In the domain of environmental behavior, perceived power may therefore mainly have a direct effect on behavior, not an indirect one. In this latter instance, the positive effect of perceived power is not explained by attitudinal variables. When a consumer considers that she has the capacity to recycle her cardboard or used batteries, she is likely to do it, regardless of the importance, duration, or cost that she assigns to the behavior. The lack of relationship between perceived power and public behavior might be explained by the fact that consumers enact environmental activist behavior when they feel helpless about a given situation, and view public activism as an ultimate recourse for solving the problem (Lee et al., 2014). Conversely, consumers are more likely to engage in private behavior when they feel increased capability (Rice, 2006).

6.2. Managerial implications

The results present an interesting contribution in that consumers who have more money and time available will be more likely to engage in private behavior, not because they do have more money and time available, but because these two contextual factors lead them to perceive PEB as more important and less costly. Companies and policy-makers may develop communication campaigns to stimulate PEBs by fostering positive attitudes among consumers. This could be done by emphasizing price and time savings that PEBs could induce, so as to increase consumers' attitude toward the importance and inexpensiveness of pro-environmental private behavior. For instance, increasing taxes on environmentally harmful actions can make private sphere behavior appear financially attractive. Information can be provided on the financial consequences of certain environmental choices, thereby correcting possible misperceptions (Abrahamse and Matthies, 2012). Since public behavior is directly dependent on consumers' perception of their available time and money, environmental activists may focus on recruitment campaigns enrolling consumers whose perception of time and money available is more extended, in addition to running campaigns emphasizing price and time savings. Thus it is important to match consumers' perception of their context (i.e. time and money available) with pro-environmental objectives.

Perceived power may be a more straightforward influencer of private behavior (cf. Stern, 2000). Thus, in order to encourage PEB on a private level, organizations and policy-makers should focus on enhancing consumers' feeling of capability to perform PEB. Besides, consumers who have more time or money available will be more likely to engage in private or public PEB, as they find such PEB more important and less costly. Therefore, companies and policy-makers may develop PEBs by fostering positive attitudes among consumers through communication and campaigns emphasizing price savings and time savings that PEBs could induce.

6.3. Limitations and future research avenues

Although much care was taken to optimize the study, several limitations are noteworthy. First, we considered a limited set of contextual factors. Many more are worth being investigated, such as interpersonal influences (e.g. persuasion), advertising, community expectations, and legal and institutional factors.

Second, we only considered a reduced set of attitudinal factors, namely behavior-specific attitudes. Other factors such as personal norms, beliefs and values, as delineated in the value belief norm theory, or affect and motivations do exist (Steg and Vlek, 2009). It would be interesting to explore which contextual factors determine what type of attitude (thus, goal-frame) most strongly affects behavior.

Third, although there is evidence of an attitude-behavior gap, especially in the domain of environmental behavior (Lee et al., 2014), we did not take this gap into account in our mediation model. Future research could investigate the different variables that may hinder the effects of importance and cost on PEB.

Finally, there are also several limitations regarding the methodology used in this study. First, cross-sectional nature of the study does not enable us to test for causality or long-term effects of attitude. A longitudinal study may yield additional insights into the mediating mechanism of attitudes in the context-behavior relationship. Second, we used MTurk, which has a non-random sampling frame limiting the generalization of the findings from the sample to the population of interest. However, there is growing evidence that data obtained from MTurk are at least as reliable as those obtained via traditional methods (e.g., Buhrmester, 2011; Casler et al., 2013).

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Figure 1. Conceptual model

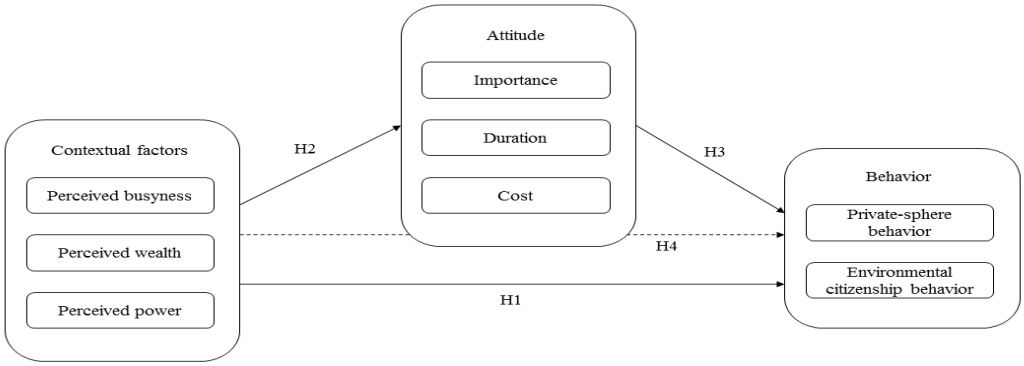

Table 1
Prior research on the effect of causal variables on pro-environmental behavior

Study	Method	Causal variables	Pro-environmental behavior of interest	Guiding theory / theories	Research question(s) and key findings
Intra-psychic variables only					
Bamberg and Schmidt (2003)	Survey	Beliefs, intention, attitude, subjective norm, perceived behavioral control, habit, ascription of consequences, ascription of responsibility, personal norm,	Pro-environmental behavior	Norm-activation model, theory of planned behavior, theory of interpersonal behavior	Role beliefs and use habit from the theory of interpersonal behavior increase, respectively, the explanatory power and the predictive power offered by the TPB, whereas the personal norm variable of the norm-activation model exerts no significant effect either on intention or on behavior.
Poortinga, Steg and Vlek (2004)	Survey	Quality Of Life (QOL) values, New Environmental Paradigm (NEP) concerns, concern about global warming	Policy support, acceptability of energy-saving measures, and energy use	Value-belief-norm theory	Values, as well as general and specific environmental concern explain well policy support and acceptability of energy-saving measures, whereas actual energy use is related to sociodemographic variables, stressing the need to not only focus on attitudinal variables such as values to explain all types of environmental behavior.
Bamberg and Möser (2007)	Archival datasets	Problem awareness, internal attribution, social norm, feelings of guilt, PBC, attitude, moral norms, intentions	Pro-environmental behavior	Norm-activation model, theory of planned behavior	Pro-environmental behavioural intention mediates the impact of psycho-social variables on pro-environmental behaviour. In addition, besides attitude and behavioural control, personal moral norm is a third predictor of pro-environmental behavioural intention. Problem awareness is an important but indirect determinant of pro-environmental intention. Its impact seems to be mediated by moral and social norms, guilt and attribution processes.
Klöckner, 2013	Archival TPB data	Perceived behavioral control, habits, attitudes, personal norms, social norms, intentions, awareness of consequences, ascription of responsibility, ecological worldview, self-transcendence values, and self-efficacy	Individual environmentally relevant behavior	Theory of planned behavior	Intentions to act, perceived behavioural control and habits were identified as direct predictors of behaviour. Intentions are predicted by attitudes, personal and social norms, and perceived behavioural control. Personal norms are predicted by social norms, perceived behavioural control, awareness of consequences, ascription of responsibility, an ecological world view and self-transcendence values. Self-enhancement values have a negative impact on personal norms.
Noppers, Keiser, Bolderdijk and Steg (2014)	Survey	Instrumental, symbolic and environmental attributes	Adoption of sustainable innovation	Theory of innovations adoption	The adoption of sustainable innovations depends not only on instrumental or environmental attributes but also on symbolic ones especially for interest in, the acceptability of, and the intention to adopt the sustainable innovation
De Leeuw, Valois, Ajzen and Schmidt, 2015	Survey	Beliefs, attitudes, subjective injunctive norm, subjective descriptive norm, perceived behavioral control and intentions	Eco-friendly behaviors	Theory of planned behavior	The TPB framework may more accurately predict pro-environmental behavior when complemented with variables such as descriptive norms, moral norms, sex, and empathic concern
Contextual variables only					
Vining and Ebreo (1992)	Longitudinal survey	Voluntary curbside recycling program	Environmental concern, attitudes toward recycling, recycling behavior	Norm-activation model	The implementation of a voluntary curbside recycling program increases consumers' propensity to recycle, the actual volume of materials recycled, but also environmental concern and specific attitudes regarding recycling.

Derksen and Gartrell (1993)		Social context	Recycling behavior		Consumers with access to a structured recycling program have much higher levels of recycling than do people lacking such access. Attitudes toward environment affect recycling only among consumers with easy access to the recycling program, whereas individual concern about the environment enhances the effect of the recycling program, but does not overcome the lack of access to the recycling program.
Van Diepen and Voogd (2001)	Survey	Spatial context of the household and urban form	Sustainable household practices	Modern planning theory	Household behaviour is more influenced by urban form in a complex way. More energy-intensive and thus less sustainable household practices are more common at the urban outskirts than in rural area, whereas differences according to neighbourhood building design were inappreciable.
Thøgersen (2003)	Quasi-experimental field study	Weight-based waste disposal fee	Recycling behavior and motivations	Performance-dependent incentive theory	The felt obligation to recycle and the self-reported recycling behaviour was, marginally but significantly, higher in municipalities offering an economic incentive for recycling in the form of a weight-based fee
Verplanken, Walker, Davis and Jurasek (2008)	Quasi-experimental field study	Presence of absence of context change	Commuting to work	Habit discontinuity hypothesis, self-activation hypothesis	Context change, such as through the act of moving from one place to another, for example, can activate important values that guide the process of negotiating sustainable behaviors.
Contextual variables and intra-personal variables					
Black, Stern and Elworth (1985)	Field study	Economic, demographic, contextual and psychological variables	Four behaviorally distinct types of energy efficiency improvements or curtailment of the energy provider's services	Attitude Behavior Context (ABC) theory	Contextual variables, especially economic and structural variables (e.g. fluctuating fuel price), affect behavior through personal variables such as attitudes, beliefs and norms. The interaction effect is least strong for unconstrained behaviors and strongest for more constrained action.
Guagnano, Stern and Dietz (1995)	Field experiment	Attitudes, availability of recycling	Recycling behavior	Attitude Behavior Context (ABC) theory, norm-activation model	Both attitudinal and external factors act in combination to influence behavior in two different ways. There is a main effect of attitude and external factors on the recycling behavior. Besides, external conditions can impact attitudinal process and recycling behavior may be influenced by cognitive and social-psychological processes.
Corraliza and Berenguer (2000)	Survey	Environmental beliefs, values, physical-environmental inhibition level, environmental concern and situational variables	Environmental actions	Inhibition-facilitation theory	Environmental behavior depends on personal and situational variables in an interactive way. When high conflict level is generated between personal dispositions and situational conditions, the predictive power of attitudes tends to be minimal, whereas in the case of consistency between them it tends to be maximal.
Heath and Gifford (2002)	Field experiment	Intention, perceived behavioral control, social norms, moral norms, environmental concerns and values, availability of a universal bus pass	Use of public transportation	Theory of planned behavior	Bus ridership significantly increased after the introduction of a universal buss pass in addition to associated changes in attitudes and beliefs related to transportation modes.
Clark, Kotchen and Moore (2003)	Survey	Altruism, environmental concern, individuals with asthma in the household, income, household size, gender, motives	Green electricity participation	Norm-activation model	It is important to consider both internal and external influences on PEB. Altruistic and environmental attitudes, along with greater ability to pay (in terms of greater income and fewer household members), reliably predict pro-environmental behavior such as participation in a green electricity program.
Cho, Thyroff, Rapert,	Survey	Perceived cultural environment	Perceived consumer effectiveness,	Value-Belief-Norm theory,	Horizontal collectivism and vertical individualism are important influencers of perceived consumer effectiveness. In turn, PCE positively affects

Park and Lee (2013)		(collectivism vs. individualism)	environmental attitude, and environmental commitment	Cultural dimensions	environmental attitude which results in pro-environmental commitment manifested in specific behavioral intentions
Kalamas, Cleveland and Laroche (2014)	Survey	Perceived corporate responsibility, government responsibility, God/Higher power, natural earth-cycle	Pro-environmental behavior	Locus of control theory	Consumers ascribing environmental responsibility to powerful-others engage in PEBs; whereas those attributing environmental change to chance/fate typically do not.
Atkinson and Rosenthal (2014)	Experiment	Argument specificity and product involvement	Eco-label trust, attitudes toward the product	Signaling theory	The contextual element of adding an eco-label or a third-party-certification seal to low-involvement brands can create more consumer brand and retailer trust, which in turn increases perceptions of source quality and make the purchase of pro-environmental more easy, convenient and achievable.
Grimmer, Kilburn and Miles (2015)	Two-stage survey	Intention, implementation intention, situational context	Pro-environmental consumer behavior	Intention-Plans-Behavior model	The purchase situation moderates the relationship between intention to realize a pro-environmental behavior and the actual enactment of such a behavior. Time, price, willingness to drive long distances, availability, and ease of purchase influence the relationship.

Table 2
Psychometric properties of the measures

Variables	Mean	Standard Deviation	α	CR	AVE
1. Perceived busyness	3.73	1.36	0.86	0.86	0.61
2. Perceived wealth	3.35	1.46	0.87	0.85	0.59
3. Perceived power	5.62	1.09	0.86	0.85	0.44
4. Importance	3.62	2.93	0.88	0.86	0.52
5. Duration	4.92	1.00	0.78	0.87	0.48
6. Cost	4.02	0.86	0.83	0.83	0.41
7. Private-sphere behavior	3.71	1.59	0.76	0.76	0.45
8. Public-sphere behavior	2.72	1.71	0.77	0.77	0.53

Table 3
Results of the structural equation model

Relationships	Path loading and level of significance
Overall analysis	
Context → Attitude (path a)	.658***
Attitude → Behavior (path b)	.982***
Context → Behavior (path c)	-.007 (n.s.)
Piecemeal analysis	
Perceived busyness → Importance	.142***
Perceived wealth → Importance	.477***
Perceived power → Importance	-.014 (n.s.)
Perceived busyness → Duration	.305***
Perceived wealth → Duration	.066 (n.s.)
Perceived power → Duration	.334***
Perceived busyness → Cost	.100**
Perceived wealth → Cost	.594***
Perceived power → Cost	.047 (n.s.)
Importance → Private-sphere behavior	.670***
Duration → Private-sphere behavior	-.044 (n.s.)
Cost → Private sphere-behavior	.252***
Importance → Public-sphere behavior	.442***
Duration → Public-sphere behavior	.011 (n.s.)
Cost → Public-sphere behavior	.364***
Perceived busyness → Private-sphere behavior	-.092 (n.s.)
Perceived wealth → Private-sphere behavior	.024 (n.s.)
Perceived power → Private sphere-behavior	.101**
Perceived busyness → Public-sphere behavior	.150**
Perceived wealth → Public-sphere behavior	.179**
Perceived power → Public-sphere behavior	-.008 (n.s.)

Notes: n.s. stands for "non-significant".
* $p < .05$
** $p < .01$
*** $p < .001$

Table 4
Results of multivariate and bootstrap mediation tests[a]

	Path	Importance (mediator)	Duration (mediator)	Cost (mediator)	Private-sphere behavior		Public-sphere behavior	
Perceived busyness								
Perceived busyness → DV	c				-.082 (n.s.) (H1a)		.158** (H1a)	
Perceived busyness → Mediators	a	.156** (H2a)	.090** (H2a)	.119*** (H2a)				
Importance → DV	b1				.506*** (H3a)		.626*** (H3a)	
Duration → DV	b2				.022 (n.s.) (H3b)		-.048 (n.s.) (H3b)	
Cost → DV	b3				.409*** (H3c)		.458*** (H3c)	
Perceived busyness → DV	c'				.208**	H4a	.315***	H4a
Overall F					73.36***		104.09***	
Adj R^2					.421		.508	
Mediation 95%	ab				.125		.156	
Confidence Interval					(.05, .21)		(.07, .25)	
Mediation					Full		Partial	
Perceived wealth								
Perceived wealth → DV	c				.090 (n.s.) (H1b)		.160** (H1b)	
Perceived wealth → Mediators	a	.376*** (H2b)	-.054 (n.s.) (H2b)	.255*** (H2b)				
Importance → DV	b1				.492*** (H3a)		.602*** (H3a)	
Duration → DV	b2				.025 (n.s.) (H3b)		-.046 (n.s.) (H3b)	
Cost → DV	b3				.380*** (H3c)		.409*** (H3c)	
Perceived wealth → DV	c'				.371***	H4b	.493***	H4b
Overall F					73.55***		103.79***	
Adj R^2					.421		.507	
Mediation 95%	ab				.281		.333	
Confidence Interval					(.21, .36)		(.25, .42)	
Mediation					Full		Partial	
Perceived power								
Perceived power → DV	c				.119* (H1c)		.054 (n.s.) (H1c)	
Perceived power → Mediators	a	-.019 (n.s.) (H2c)	.204*** (H2c)	.049 (n.s.) (H2c)				
Importance → DV	b1				.517*** (H3a)		.638*** (H3a)	
Duration → DV	b2				-.023 (n.s.) (H3b)		-.094 (n.s.) (H3b)	
Cost → DV	b3				.422*** (H3c)		.497*** (H3c)	
Perceived power → DV	c'				.126 (n.s)	H4c	.047*	H4c
Overall F					73.91***		98.49***	
Adj R^2					.423		.494	
Mediation 95%	ab				.006		-.007	
Confidence Interval					(-.08,.09)		(-.11,.09)	
Mediation					None		None	

*** p < .001, ** p < .01, * p < .05.

[a] Path a = the direct effect of the independent variable on the mediating variable;
Path b = the direct effect of the mediating variable on the dependent variable;
Path c = the direct effect of the independent variable on the dependent variable;
Path c' = the total effect (ab + c);
Path ab = the indirect effect of the independent variable on the dependent variable through the proposed mediator.