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## **How anticipated emotions shape behavioral intentions to fight climate change**

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## **How anticipated emotions shape behavioral intentions to fight climate change**

### **Abstract**

Prior research concerning anticipated emotions (AEs) identified the influence of negative anticipated emotions (NAEs) on the regulation of effortful behaviors, but few studies were able to demonstrate the role of positive anticipated emotions (PAEs). We address this gap by examining the influence of not only NAEs but also PAEs on behavioral intentions in the context of climate change and the roles of perceived behavioral control and behavioral engagement in this relationship. Using a sample of 516 respondents and structural equation modeling, we find that perceived behavioral control partially mediates the influence of AEs on behavioral intentions. Moreover, pro-environmental behavioral engagement moderates the relationship between AEs and behavioral intentions such that the effects of PAEs on behavioral intentions are stronger in the engaged groups and the effects of NAEs on behavioral intentions are stronger in the low/non-engaged group. Highly engaged individuals use both PAEs and NAEs to regulate their future behaviors.

**Keywords:** anticipated emotions; perceived behavioral control; climate change; behavioral intentions; behavioral engagement

## 1. Introduction

Research on climate change shows that informing people about the current or future consequences of climate change, such as species extinction, flooding, and lack of drinking water, is not sufficient to change their behaviors (Gifford, 2011; Hornsey, Harris, Bain, & Fielding, 2016; Myers, Nisbet, Maibach, & Leiserowitz, 2012; Norgaard, 2011; Ockwell, Whitmarsh, & O'Neill, 2009). Changing behaviors, such as consumption patterns, is complex and can involve more than only providing new and convincing information regarding climate change as follows: “we might truly know it is better to recycle or to go by bike to our work, but to change our behavior and sustain the change, it needs to be emotionally rewarding and easy to follow” (Macharis & Kerret, 2019, p.1). To this end, many argue for more research on the role of emotions in the shaping of behaviors and effective communication about climate change (Roeser, 2012; Salama & Aboukoura, 2018). For example, many studies have examined the effectiveness of fear-based or hope-based messages (Poels & Dewitte, 2019, for a review). However, prior research has mainly explored the emotions directly felt after viewing or reading a communication related to climate change. As such, it remains unclear whether these messages have an impact on people's behaviors. There is no consensus regarding the influence of emotions on the climate issue, and more theoretical research “grounded in rigorous affective science” is needed (Chapman, Lickel, & Markowitz, 2017).

There are still many questions about climate change and how emotions can truly impact behaviors (Bieniek-Tobasco, McCormick, Rimal, Harrington, Shafer, & Shaikh, 2019). One explanation of the difficulty in answering these questions might be linked to the possibility that emotions do not directly influence future behaviors but rather guide them through anticipated emotions (AEs) as advocated by the feedback theory of emotions (Bagozzi & Pieters, 1998; Bagozzi, Dholakia, & Basuroy 2003; Perugini & Bagozzi, 2001). In this view, emotions that follow behaviors act as feedback systems for anticipating

emotional consequences and regulating future behaviors (Baumgartner, Pieters, & Bagozzi, 2008; Baumeister, Vohs, DeWall, & Zhang, 2007). In regard to behavior that may have negative consequences for oneself or society, previous research has shown that negative anticipated emotions (NAEs) have a greater impact than positive anticipated emotions (PAEs) (Rivis, Sheeran, & Armitage, 2009). However, prior work did not clearly establish the influence of PAEs on behavioral intentions in the context of climate change (Ojala, 2012; 2015). In an environmental context, Carrus, Passafaro, & Bonnes (2008) show for instance that only NAEs have an influence on the use of public transportation and household recycling.

The current research proposes that the impact of PAEs on behavioral intentions has been largely underestimated because prior research has neglected the indirect influence of AEs (van Valkengoed & Steg, 2019), leading environmental communication strategies to focus on negative emotions rather than positive emotions. Indeed, emotions can activate cognitive predispositions that orient the appraisal of future events, especially the sense of personal agency, i.e., the perception that the self is the cause of the event (Antonetti & Maklan, 2014; Kouchaki, Oveis, & Gino, 2014; Lerner & Keltner, 2001). Building on these elements, and focusing on perceived behavioral control (PBC), whose importance has been repeatedly identified in the fields of ethical consumption (Antonetti & Maklan, 2014), environmental protection (Carrus et al., 2008) and climate change (van Valkengoed & Steg, 2019), this research shows that AEs have a significant direct and indirect influence through PBC on behavioral intentions.

Moreover, little research in the field of AEs has focused on moderating variables that may modify the influence of PAEs on behavioral intentions to fight climate change. Among the variables that may influence the drivers of behavioral changes, the level of individual engagement towards environmental protection may moderate the relationship between AEs and behavioral intentions (Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007).

By investigating the effect of AEs and PBC on behavioral intentions, as well as the moderation by behavioral engagement, we address two theoretical gaps. First, in line with affective feedback theory (Baumeister et al., 2007), we explain how AEs indirectly determine behavioral intentions through PBC. Unlike previous studies that mostly consider negative emotions in the context of climate change (Smith & Leiserowitz, 2014; Swim, Clayton, Doherty, Gifford, Howard, Reser, & Weber, 2009; van Valkengoed & Steg, 2019), our research provides insights about the effect of PAEs and details how PBC mediates the effect of AEs on behavioral intentions. In so doing, we are also answering the call for more research on the interplay between important motivational factors of climate change adaptation behaviors (van Valkengoed & Steg, 2019). Second, as an extension of prior studies (e.g., Lorenzoni et al., 2007; Wolf & Moser, 2011), we explore how existing behavioral engagement moderates the effect of AEs on behavioral intentions.

The current research questions communication about climate change that traditionally relies on negative emotions (e.g., Ereaut & Segnit, 2006; O'Neill & Nicholson-Cole, 2009) associated with varying behavioral engagement towards climate change (e.g., Wolf & Moser, 2011). Considering the direct and indirect influences, as well as the moderating role, of environmental engagement emphasizes the importance of considering post-behavioral positive emotions in fighting climate change and using negative emotions only with individuals with low or no behavioral engagement. Our research findings could be useful to public policymakers and organizations in showing how and why it would be wise to mobilize positive emotions in communication promoting actions to limit or reduce climate change.

## **2. Literature review and hypotheses development**

### *2.1. Anticipated emotions in decision making*

According to Ravis et al. (2009, p. 2987), “anticipated affect refers to the prospect of feeling positive or negative emotions (e.g., exhilaration, regret) after performing or not performing a behavior”. AEs directly influence behavioral intentions and indirectly influence behaviors (Ravis et al., 2009, for a meta-analysis) because people are motivated to adopt behaviors that lead to PAEs and avoid behaviors that are associated with NAEs (Bagozzi & Pieters, 1998; Baumeister et al., 2007; Frijda, 2007).

Early research on the influence of AEs in decision making found negative post-behavioral affective reactions in the specific forms of anticipated regret at not using a condom (Abraham & Sheeran, 2004; van Empelen, Kok, Jansen, & Hoebe, 2001), anticipated regret at not exercising (Abraham & Sheeran, 2004; Sheeran & Abraham, 2003) and anticipated regret at smoking (Conner, Sandberg, McMillan, & Higgins, 2006). The link between NAEs and health-related behavioral intentions has also been established with more global forms of NAEs (Conner & Flesh, 2001; Moan & Rise, 2005; O’Connor & Armitage, 2003). These studies confirm that the NAEs, most often studied as anticipated regret, decrease the expectations that one would behave negatively after controlling for theory of planned behavior (TPB) constructs.

A second stream of research, built around the model of goal-directed behaviors (MGB, Perugini & Bagozzi, 2001), shows how AEs could explain behaviors related to goals such as quitting smoking or losing weight. In the MGB, AEs are measured globally and simultaneously with a main distinction between PAEs and NAEs. PAEs are felt when one succeeds in achieving one’s goal, whereas NAEs are felt in the case of failure. Theoretically, both PAEs and NAEs have a positive influence on the desire to achieve the goal that itself influences behavioral intent. However, most of these studies have shown that PAEs have either less influence than NAEs in many areas or no significant influence for explaining studying effort (Perugini & Bagozzi, 2001), various effortful decisions (Bagozzi et al., 2003), household recycling, and the use of public transportation (Carrus et al., 2008).

Most of this research has focused on health or environmental behaviors related to negative consequences for oneself or for society, which may explain why PAEs display a weak influence in most of these studies. More recent research that is theoretically based on the MGB underlines the significant and often higher influence of PAEs compared to NAEs when the behaviors studied have fewer negative consequences, such as cruise traveling (Han, Lee, & Hwang, 2016), bike traveling (Meng & Han, 2016) or traveling internationally (Lee, Song, Bendle, Kim, & Han, 2012); in the field of leisure, such as gambling in casinos (Song, Lee, Norman, & Han, 2012), revisiting a festival (Song, Lee, Kang, & Boo, 2012), and visiting a shopping center (Hunter, 2006); and even in the environmental field, such as using a bicycle for daily travel (Passafaro, Rimano, Piccini, Metastasio, Gambardella, Gullace, & Lettieri, 2014) and saving energy (Webb, Soutar, Mazzarol, & Saldaris, 2013). Table 1 offers several references on the influence of PAEs and NAEs on behavioral intentions in various domains.

It might therefore be the case that the type of behavior that is studied explains the respective influences of PAEs or NAEs. However, none of the previous works cited tested the influence of AEs on behavioral intentions in the context of climate change. Therefore, we propose the following:

**H1a** PAEs towards acting to fight climate change have a positive effect on behavioral intentions.

**H1b.** NAEs towards not acting to fight climate change have a positive effect on behavioral intentions

**Table 1 about here**

## *2.2. Indirect influence of AEs through PBC*

The construct of PBC is defined as “people’s expectations regarding the degree to which they are capable of performing a given behavior” (Ajzen, 2002, p. 676). PBC contains



two components. The first is related to the ability to achieve a given behavior, perceived difficulty (“it’s easy or difficult for me to perform the behavior if I want to do so”), and the second pertains to the degree of control that a person has over this behavior, perceived controllability (“the performance on that behavior is up to me”) (Perugini & Bagozzi, 2001; Taylor, 2007).

In the literature, Ajzen (2011) theoretically argues that AEs have an influence on the relevant beliefs about one’s PBC in a given situation. Prior research has further established the direct relationship between PBC and behavioral intentions (Ajzen & Madden, 1986; Ajzen, 2002; Huang, 2016). However, the specific mediation of PBC in the relationship between AEs and behavioral intentions in the context of climate change has not received empirical attention. Given that PBC is an important factor revealing how easily individuals intend to behave on a daily basis against climate change (Gifford, 2011), we consider PBC as crucial in reinforcing the relationship between AEs and behavioral intentions.

First, the emotions that we feel, remember or imagine we feel activate the behavioral control system. Indeed, in a functional magnetic resonance imagery (fMRI) study, Gilead, Katzir, Eyal, and Liberman (2016) find that eliciting self-conscious emotions such as pride or guilt with past or future events activates the dorsal anterior cingulate cortex (dACC) and lateral-dorsal prefrontal cortex, which are brain areas “involved in effortful cognitive control”. As to PAEs, Fredrickson (1998) and Fredrickson and Branigan (2005) found that they broaden the thought-action repertoire, leading individuals to think about actions that will allow them to feel positive emotions again. While developing this repertoire of actions, individuals will have the impression that they can do something in favor of the objective, increasing PBC. Further, Winterich and Haws (2011) showed that the future-oriented temporal focus related to positive emotions influences people’s actual self-control.

As to NAEs, Baumeister et al. (2007, for a review) found that they increase levels of counterfactual thinking such that solutions can be found to avoid them, leading individuals to think about actions that will allow them to avoid negative emotions in the future. As such, we contend that NAEs are likely to increase PBC.

Second, as TPB suggests (Ajzen, 1991), perceived control over actions influences subsequent behaviors (Antonetti & Maklan, 2014; Rice, 2006), especially when the threat is so great that people feel unable to take action to cope with it (Ajzen, 1991; Sheeran, Harris, & Epton, 2014). According to the TPB, PBC influences actual behavior as the result of perceived limiting conditions related to money or time. However, PBC also influences behavioral intentions; people's beliefs about how easily they can achieve behaviors have relative motivating effects (Ajzen & Madden, 1986). The perceptions that people have of performing given behaviors depend not only on the required resources and opportunities but also on their abilities to overcome obstacles they may encounter (Ajzen, 2002; Huang, 2016). In the context of environmental studies, we further note that a direct link emerges between PBC and behavioral intentions (Bamberg & Möser, 2007 for a meta-analysis).

Therefore, we propose the following:

**H2a.** PBC mediates the effect of PAEs on behavioral intentions to fight climate change.

**H2b.** PBC mediates the effect of NAEs on behavioral intentions to fight climate change.

### *2.3. The moderating effect of behavioral engagement*

Within the environmental domain, many studies have pointed to the attitude-behavior gap. Kilbourne and Pickett (2008, p. 885) noted that “environmentally concerned consumers do not seem to show any consistent preference for environmentally friendly products in their purchase behavior”. In the current research, we rely on the concept of behavioral engagement,

which measures the behavioral component of the “personal state of connection” with the issue of environmental protection (Lorenzoni et al., 2007, p. 446), rather than the concept of involvement, which reflects the “perceived relevance of the object based on inherent needs, values, and interests” (Zaichkowsky, 1985, p. 342). Furthermore, our conceptual development relies on the proposition that the positive and negative emotions felt after performing a behavior are used by individuals to regulate their future behaviors, which is consistent with emotional feedback theory (Baumeister et al., 2007). As such, it is relevant to rely on behavioral engagement to capture individuals’ past behaviors.

People’s behavioral engagement towards environmental protection manifests in various behaviors (Kilbourne & Pickett, 2008). Dietz, Stern, and Guagnano (1998) identify the following three main types of behaviors: (1) consumption, which has a direct effect on the environment (e.g., recycling and green purchasing), (2) environmental citizenship (e.g., donation, petition signing, and participation in environmental groups), and (3) policy support that implies a sacrifice (e.g., higher taxes to support the environment). In this study, we focus on behaviors that have direct effects on the environment, especially those that reduce carbon consumption. To this end, Kilbourne and Pickett’s (2008) environmental behavior scale is particularly relevant.

According to emotional feedback theory (Baumeister et al., 2007), the emotional consequences of our past behaviors are stored and used to orient future behaviors when a similar situation occurs, thanks to the anticipation of emotions. Therefore, individuals’ past behaviors are likely to influence the relationships between AEs and behavioral intentions.

According to this theory, feeling positive emotions generally informs about the performance of successful behaviors and acts as a virtuous circle, while sustaining or fostering the behavioral efforts already engaged. In the current study, we suggest that individuals who already have a (high) behavioral engagement in the environmental context

will benefit from their positive emotional experiences and will likely rely on PAEs to influence their behavioral intentions. We further contend a decreasing gradation of the influence of PAEs on behavioral intentions as behavioral engagement decreases. Indeed, individuals who display lower behavioral engagement levels are less likely to feel positive emotions related to their behaviors because they are less engaged and are thus less likely to further rely on PAEs to influence their behavioral intentions.

Conversely, Baumeister et al. (2007) indicate that feeling negative emotions related to the performance of a given behavior signals that individuals' behaviors are not successful. To avoid the repetition of those negative feelings, individuals may change consequently their future behaviors. This seems especially true for individuals displaying low/no behavioral engagement. In the case of a low/non-engaged individual who is not used to behaving in an environmentally friendly way on a daily basis, s/he might feel negative feelings and rely on them in his/her future behaviors to try to change them. We further suggest a decreasing gradation of the influence of NAEs on behavioral engagement as behavioral engagement increases. Indeed, individuals who are (highly) engaged on a daily basis may be more likely to rely on previously felt positive emotions than negative emotions felt episodically in the case of one-time misbehavior and, thus, are less likely to further rely on NAEs to influence their behavioral intentions. One-time misbehavior might occur when individuals cannot find opportunities to buy organic or local products (such as when these products are out of stock) or they are unable to use public transportation (such as during strike movements).

Therefore, we expect that behavioral engagement may influence people's utilization of AEs. More specifically, we expect that the more people are behaviorally engaged, the more influential PAEs are and that the less people are behaviorally engaged, the more influential NAEs are.

**H3a.** The influence of PAEs on behavioral intentions is stronger for engaged and highly engaged individuals than for low/non-engaged individuals.

**H3b.** The influence of NAEs on behavioral intentions is stronger for low/non-engaged individuals than for engaged and highly engaged individuals.

Figure 1 summarizes our conceptual framework, which also includes control variables related to consumer characteristics (gender, age, and profession). Prior research has examined the associations of sociodemographic variables (age, gender, profession) with sustainable behaviors (Diamantopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003; Straughan & Roberts, 1999). Overall, prior research has found contradictory results about the impact of these variables on behavioral intentions. For instance, Diamantopoulos et al. (2003) found that women tend to display greener behavioral habits than men, but no clear association was revealed between age and behavioral intentions or profession and behavioral intentions. More recently, Schill et al. (2019) found no influence of age, gender, or profession on sustainable purchase intentions. In contrast, Gilg, Barr, and Ford (2005) found that younger individuals are likely to engage in sustainable behaviors. Recent research has further found that age, gender (Choi & Johnson, 2019) and profession (Kastenhofer, Lansu, van Dam-Mieras, & Sotoudeh, 2010; Barreto et al., 2014) significantly impact sustainable intentions. It appears that these conflicting results underline the necessity to control for sociodemographic factors' effects in our context.

*Figure 1 about here*

### **3. Research methodology**

#### *3.1. Context and data collection*

In 2015, in France, climate change appeared as a central environmental concern with extended media coverage about the COP (Conference of Parties). French respondents

highlighted climate change as a policy priority (Datalab, 2016). With regard to climate change, 77% of French respondents reported feeling worried, 80% reported believing that it would have important consequences for their health, and 52% reported feeling a sense of urgency about it and believing that they could undertake personal action to combat it (Havas Worldwide Paris, 2015). Many declared that they care about wasting water and energy (72%), that they recycle their waste (66%) and that they consume local and environmentally friendly products (47%). Only a very small number (4%) reported that they engage in bad environmental behaviors and do nothing to combat climate change (ManoMano, 2015). Overall, French consumers express various forms of behavioral engagement in acting against climate change.

For this study, we used convenience sampling to target real consumers. We collected data in France during the second semester of 2015. The second author and trained graduate students collected the data. The respondents came from cities all over France and were relatives, acquaintances or unknown individuals intercepted in malls or streets. The participants were 18 years or older, and trained interviewers administered the questionnaires face to face. Of the 516 respondents, 280 were men (54.3%), and 236 were women (45.7%). The respondents' ages ranged from 18 to 82 years (mean [M] = 32; standard deviation [SD] = 13.5). Table 2 details the sample characteristics.

### ***Table 2 about here***

#### ***3.2. Measurement instruments***

Our questionnaire relied on valid scales in English; in line with Douglas and Craig (2007), it was back-translated by native speakers. First, a bilingual French native speaker translated the items into French. Second, a bilingual English native speaker translated them back into English. We finally compared the two translations and discussed eventual disagreements. The questionnaire started with general measures of concerns and attitudes

towards the issue of climate change. Then, we developed measures of PBC, behavioral engagement, and behavioral intentions. Next, we asked about PAEs and NAEs, and ended with sociodemographic variables. We detail hereafter the measurement scales.

We derived PBC, AEs (negative and positive), and behavioral intentions from well-established scales in the environmental context (Carrus et al., 2008) and adapted them to the context of climate change. We measured *PBC* with two items asking the respondents to rate how difficult/easy and complicated/simple it was for them to act against climate change on a daily basis (1 = "extremely complicated/difficult", 7 = "extremely easy/simple"). We measured *PAEs* with 7 items introduced by a question expressed in the conditional form: "If during the next two weeks you will act against climate change, how much do you think you would feel ... delighted/excited/happy/glad/satisfied/proud/self-assured?" We measured *NAEs* with 8 items introduced by a question expressed in the conditional form: "If during the next two weeks you will not act against climate change, how much do you think you would feel ... angry/frustrated/unsatisfied/discontented/guilty/ sad/disappointed/depressed/fearful?" The respondents reported the felt intensity of their AEs on a 7-point scale (1 = "not at all," 7 = "completely"). We measured *behavioral intentions* with two items: "During the next two weeks, I will act against climate change on a daily basis" and "During the next two weeks, I intend to act against climate change on a daily basis". The respondents rated how unlikely/undecided and likely/decided they were about acting (1 = "unlikely/undecided", 7 = "likely/decided").

We captured *behavioral engagement* based on direct behaviors that people perform to act against climate change, which were measured with four items from Kilbourne and Pickett (2008) (buying environmentally friendly products, reducing household waste, using products made from recycled material, buying organic food) and three additional items related to climate change (reducing household energy consumption, using public transportation, and

buying local products). These last three items illustrate French concerns about climate change and are in line with public policy discourses targeting consumers (Boy, 2015). These items are further in line with climate change research (Newman, Howlett, Burton, Kozup, & Heintz Tangari, 2012; Brügger, Morton, & Dessai, 2016). The seven behavioral questions had yes/no answers with regard to specific behaviors (0 = “no,” 1 = “yes”). We created a score for behavioral engagement that distinguished three groups: low/non-engaged, engaged, and highly engaged. We attributed 1 point to each behavior performed, coding 0 to 2 points as low/non-engaged (=1), 3 to 4 points as engaged (=2), and 5 to 7 points as highly engaged (=3). The sample sizes are as follow: low/non-engaged N=182 (including 29 individuals who reported no behavioral engagement at all); engaged N=170; highly engaged N=164. Appendix 1 contains all the measurement scales. The questionnaire also included sociodemographic variables (gender, age, profession) as control variables.

## **4. Analyses and results**

### *4.1. Assessment of measurement model*

A confirmatory factor analysis (maximum likelihood estimation) in AMOS 24 revealed the structure of the measurement model prior to structural model testing (Gerbing & Anderson, 1988). The fit indices of the measurement model indicated an overall good fit:  $\chi^2 = 126.53$ ,  $df = 48$ ,  $p < 0.001$ , root mean square error of approximation (RMSEA) = 0.056, confirmatory fit index (CFI) = 0.98, Tucker-Lewis index (TLI) = 0.98, and  $\chi^2/df = 2.64$ . The constructs' internal consistency was adequate; the composite reliability ( $\rho$ ) values were greater than the recommended cutoff (0.70) (Bagozzi & Yi, 1988). Table 3 shows the convergent validity of the constructs; all the remaining factor loadings were high (0.73-0.93;  $p < 0.01$ ), exceeding the critical value of 0.50 for adequate individual item reliability. The average variance extracted (AVE) values ( $\rho_{vc}$ ) also exceeded 0.50 (Fornell & Larcker, 1981). Because the AVE of each construct was also greater than the square of the interconstruct



correlations, all constructs and dimensions fulfilled the requirements for discriminant validity (Fornell & Larcker, 1981) as documented in Table 3.

***Table 3 about here***

Finally, to minimize the threat of common method variance (CMV), we implemented ex ante efforts (before the data collection) as recommended by Podsakoff, MacKenzie, Lee, and Podsakoff, (2003). We protected the respondents' anonymity. We assured the respondents that there were no right/wrong answers to reduce the respondents' apprehension. Finally, we carefully constructed the scale items to avoid any item ambiguity and keep the questions as simple and concise as possible. Thus, we relied on well-established measurement items from the prior literature. We further statistically assessed common method variance (Podsakoff et al., 2003). We used the marker variable technique ("[Knowledge] I think climate change is mostly humans' fault", 7-point Likert scale) based on the smallest correlation<sup>1</sup> (Malhotra, Kim, & Patil, 2006). The correlations remained the same after we controlled for the marker variable. Thus, common method variance did not represent a threat in this study.

#### *4.2. Structural model and hypothesis testing*

We used AMOS 24 to test our research hypotheses. We tested three alternative models to assess the superiority of our model and followed prior procedures in well-established works (Bajaj, Robins, & Pande, 2016; Diallo & Seck, 2018): the hypothesized structural model, a direct model, and a full mediation model. The hypothesized structural model (Model 1) fit the data well overall ( $\chi^2 = 126.53$ ,  $df = 48$ ,  $p < 0.001$ ; RMSEA = 0.056, CFI = 0.98, TLI = 0.98, and  $\chi^2/df = 2.64$ ). The predictors explained substantial amounts of the variance in the dependent variable (behavioral intentions) ( $R^2 = 0.57$ ) (Chin, 1998). A chi-square difference test with the direct Model 2<sup>2</sup> (i.e., no mediation, all factors directly affect behavioral

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1 The smallest correlation was between PBC and NAEs ( $r = 0.38$ ). This correlation served as the reference for the marker variable.

2  $\chi^2 = 234.81$ ,  $df = 50$ ,  $\chi^2/df = 4.696$ ,  $p < 0.001$ , RMSEA = 0.09, CFI = 0.96, TLI = 0.95

intentions in the struggle against climate change) indicated a better fit for Model 1 ( $\Delta\chi^2(df) = 108.28 (2), p < 0.01$ ). Furthermore, the comparison of the hypothesized Model 1 with the full mediation Model 3<sup>3</sup> (i.e., AEs has no direct effect on behavioral intentions, and everything is mediated by PBC) indicated the superiority of the former ( $\Delta\chi^2(df) = 129.45 (2), p < 0.01$ ). These analyses also established the positive effect of AEs on behavioral intentions, which is in line with the predictions of H1a and H1b. PAEs as well as NAEs have a positive effect on behavioral intentions ( $\gamma = 0.25, p < 0.01$  and  $\gamma = 0.29, p < 0.01$ , respectively).

We used bootstrapping (Cheung & Lau, 2008) to test the mediation of PBC in the relationship between AEs and behavioral intentions. Mediation analyses showed that PBC mediates the relationship between PAEs and behavioral intentions ( $\gamma = 0.14; p < 0.01$ ; Confidence Interval CI: [0.082; 0.194]) as well as the relationship between NAEs and behavioral intentions ( $\gamma = 0.07; p < 0.05$ ; CI: [0.022; 0.131]). These are partial mediations because PAEs and NAEs have a direct effect on behavioral intentions. These results support H2a and H2b.

To assess the moderating effect of behavioral engagement, we did not follow Preacher and Hayes's (2008) procedures using SPSS because of the qualitative nature of the moderator. Instead, we used multiple group analyses in AMOS 24. We created a score for behavioral engagement and distinguished three groups: low/non-engaged, engaged, and highly engaged. The model offered a good fit ( $\chi^2 = 313.53, df = 144, p < 0.001, RMSEA = 0.048, CFI = 0.96, TLI = 0.94, \chi^2/df = 2.18$ ). Next, we compared a model with no constraints on the structural parameters across the samples with a constrained model in which the structural parameters were constrained to equality (Diallo & Seck, 2018; Lertwannawit & Mandhachitara, 2012). According to the  $\Delta\chi$  test, the comparison revealed that the three models, i.e., one model per group (low/not engaged, engaged, and highly engaged), significantly differed overall ( $\Delta\chi =$

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<sup>3</sup>  $\chi^2 = 255.98, df = 50, \chi^2/df = 5.119, p < 0.001, RMSEA = 0.09, CFI = 0.96, TLI = 0.94$

39.80,  $df = 26$ ,  $p < 0.05$ ). Therefore, each individual path of interest required analysis to determine whether it was moderated and to reveal the significance of the difference across the three groups of behavioral engagement. Table 4 summarizes the results of the moderation. Considering the effects of positive and negative AEs on behavioral intentions reveals significant differences between groups. In line with H3a, our results show that the influence of PAEs on behavioral intentions is greater for engaged and highly engaged individuals than for low/non-engaged individuals ( $\gamma_{\text{low/no engaged}} = 0.10$ ;  $p > 0.05$ ;  $\gamma_{\text{engaged}} = 0.43$ ;  $p < 0.01$ ;  $\gamma_{\text{high-engaged}} = 0.22$ ;  $p < 0.01$ ). However, the influence of NAEs on behavioral intentions is stronger for low/non-engaged and highly engaged individuals than for engaged individuals, partially supporting H3b ( $\gamma_{\text{low/no engaged}} = 0.33$ ;  $p < 0.01$ ;  $\gamma_{\text{engaged}} = -0.03$ ;  $p > 0.05$ ;  $\gamma_{\text{high-engaged}} = 0.20$ ;  $p < 0.01$ ).

Figure 2 graphically depicts the results.

*Figure 2 about here*

*Table 4 about here*

#### 4.3. Robustness check and further analyses

To confirm the robustness of the results of Model 1 (the hypothesized structural model with partial mediation), we added consumer characteristics (age, gender, and profession) as control variables, following the recommendations of Diallo and Seck (2018). The model including the covariates has the following indices:  $\chi^2 = 181.40$ ,  $df = 81$ . A chi-square difference test indicated a better fit of the tested structural model (Model 1) ( $\Delta\chi^2(df) = 54.87$  (33),  $p < 0.01$ ). As covariates, these variables do not change the main results. Furthermore, gender ( $\gamma = 0.04$ ;  $p > 0.05$ ) and profession ( $\gamma = 0.05$ ;  $p > 0.05$ ) did not affect behavioral intentions, although age had a negative effect ( $\gamma = -0.071$ ;  $p < 0.05$ ).

## 5. Discussion and managerial implications

“Feeling is for doing” (Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008), the emotions we feel or have felt guide our future behaviors and the emotions we feel in anticipation or think we feel after acting allow us to regulate our future behaviors (Baumeister et al., 2007; Baumgartner et al., 2008). In regard to explaining effortful behaviors for which negative consequences are envisaged for either health, society or the environment, previous research has shown that NAEs are more influential than PAEs on behavioral intentions (Rivis et al., 2009). Our research nuances these findings. Based on research on AEs but also on research highlighting the influence of positive emotions (Fredrickson & Branigan, 2005), we clarify how PAEs and NAEs influence intentions to fight climate change. First, PAEs (i.e., the positive anticipated emotions related to performing behavior) and NAEs (i.e., the negative anticipated emotions in relation to not performing the behavior) have almost the same direct influence on behavioral intentions, suggesting that both are relevant in explaining intentions to fight climate change. Second, our results show that the indirect influence of PAEs via PBC is much higher (about twice as much) than that of NAEs on behavioral intentions. This result reveals the need to consider PBC an important factor since it reveals how easily individuals are likely to intend to behave on a daily basis to fight climate change. Third, we emphasize the moderating role of behavioral engagement in that AEs have a greater influence on behavioral intentions as behavioral engagement increases. For the low/non-engaged individuals, NAEs mainly influence behavioral intentions. In contrast, PAEs predominate for those who are engaged in protecting the environment. Finally, the highly engaged use both PAEs and NAEs to regulate their future behaviors.

### *5.1. Theoretical contributions*

Our research contributes to research involving climate change, emotions, PBC, and behavioral engagement. We derive three main theoretical contributions from our results.

First, we contribute to research on climate change behavioral research. Many authors have noted the need to deepen our understanding of how our emotions influence our behavior in the fight against climate change (Myers et al., 2012; Norgaard, 2011; Roeser, 2012). We respond to this need by demonstrating an interest in distinguishing future-oriented emotions that are related to a future climate change event (event-based emotions), which are either experienced now or that we think we will experience in the future as the emotions of fear or hope related to our behaviors (agent-based emotions). Accordingly, research on climate change behavior should distinguish between anticipatory emotions (the ones we feel today) and AEs (those we think we will feel after acting or not acting). Further, in a recent meta-analysis of motivational factors for climate change struggle, van Valkengoed and Steg (2019) regretted that there is no research that has focused more on the combined effects of these motivational factors and little research on moderating variables. By showing that AEs also have an indirect influence on behavioral intentions through PBC and that behavioral engagement moderates the influence of PAEs and NAEs, we are responding to this call.

Second, we contribute to research on the influence of AEs. Previous research has shown that NAEs have a significant impact when behaviors require effort or when negative consequences are associated with these behaviors, as in the case of health (Rivis et al., 2009) or environmental issues (Baumgartner et al., 2008; Carrus et al., 2008, Elgaaïed 2012, Perugini & Bagozzi, 2001) and that PAEs usually have no or less influence. Conversely, this research highlights the direct influence of PAEs and, consequently, the positive emotional consequences of acting in a pro-environmental manner. Whereas past research shows that anticipated shame or guilt (Elgaaïed, 2012) motivates people to act in favor of the environment, our research shows that the anticipation of pride, delight, or even gladness and happiness as a result of acting positively also has an influence on pro-environmental behavioral intentions. Although AEs are not considered full-blown emotions, this study is in

line with recent research showing the value of positive emotions in encouraging individuals to act in a pro-environmental manner (Chatelain, Hille, Sander, Patel, Hahnel, & Brosch, 2018; Coelho, Pereira, Cruz, Simões, & Barata, 2017). Therefore, we consider PAEs as emotional rewards from which individuals can benefit immediately. In the long run, they further help individuals engaged in the protection of the environment to sustain their efforts, the consequences of which on the environment may not be visible immediately.

Moreover, unlike previous research relying on the MGB (Carrus et al., 2008; Perugini & Bagozzi, 2001), we identify PBC as a partial mediator of the relationship between AEs and behavioral intentions. This mediation effect could be explained not only by the cognitive elaboration engendered by the emotions that broaden the repertoire of action (Fredrickson, 2001) but also by the counterfactual thinking engendered by negative emotions (Baumeister et al., 2007). Another explanation is given by Antonetti and Maklan (2014). They show that self-conscious emotions such as guilt following morally reprehensible consumption behavior or pride tend to increase people's feelings of personal responsibility and decrease the possibility to neutralize dissonance in the specific case of guilt. However, these findings do not explain why PAEs have a greater influence on the PBC construct than NAEs. In accordance with research rehabilitating the role of positive emotions (Fredrickson & Branigan, 2005; Gilead et al., 2016; Williams & DeSteno, 2008), we found that people experiencing PAEs find it easier to carry out behaviors related to fighting climate change. In doing so, we contribute to Perugini and Bagozzi's (2001) MGB model in that we show that AEs and PBC are dependent variables and that the influence of AEs on behavioral intentions is both direct and indirect through the mediation of PBC.

Third, we contribute to research on climate change and AEs. We underline the moderating effect of behavioral engagement on the relationship between PAEs or NAEs and behavioral intentions. Research on the influence of AEs often assumes that past behaviors

exert an influence that is independent of the influence of AEs on behavioral intentions (MGB – Carrus et al., 2008; Perugini & Bagozzi, 2001). Our research points out the moderating role of past behaviors when reflecting on the level of people's behavioral engagement with regard to protecting the environment. These findings are further in line with emotional feedback theory (Baumeister et al., 2007). Because behavioral engagement is related to what individuals have actually done for the environment, with underpinning emotional experiences, this research contributes to research on climate change and AEs by examining the moderating effect in the relationship between AEs and behavioral intentions.

Low/non-engagement in pro-environmental behaviors can result in negative self-conscious emotions, such as guilt, dissatisfaction, and discontentment. On the basis of more frequent negative emotional experiences, anticipating the negative consequences of future behavior against climate change might be easier for those with low/non-behavioral engagement. The absence of an influence of PAEs on people in this group also illustrates their lack of consideration of positive emotions related to behaviors involved in fighting climate change. Perhaps those who do not act despite being aware of the problem are in a form of denial of reality that prevents them from considering alternatives (Norgaard, 2011; Bieniek-Tobasco et al., 2019) or allows them to attribute environmental responsibility to external forces (Kalamas, Cleveland, & Laroche, 2014). In contrast, people from the moderately behavioral engaged group tend to mobilize PAEs; such positive emotions are the only emotions to have a significant direct and indirect influence on intentions. In this case, previous positive emotional experiences such as pride or satisfaction might explain why only PAEs influence behavioral intentions. Surprisingly, engaged consumers seem to ignore NAEs. To remain engaged, engaged people might need the positive feedback of feeling positive emotions, such as pride (Williams & DeSteno, 2008). For highly behavioral engaged consumers, the direct and indirect influences of negative and positive AEs are significant. People in this group use both

types of AEs to regulate their behaviors, and their commitment to pro-environmental behavior suggests an intrinsic motivation (Ryan & Deci, 2000). Under these conditions, the requirements are probably higher; those who are highly engaged do not need to be reassured about their pro-environmental engagement. For instance, a highly engaged individual who typically sorts his/her waste on a daily basis but misses one day may feel negative feelings related to this non-sorting behavior because it is not consistent with his/her daily habits. Therefore, s/he is likely to activate by anticipation these negative feelings felt in the past to avoid misbehavior in the future. In this case, we suggest that both AEs are useful to the pursuit of action.

### *5.2. Managerial implications*

Moving beyond these theoretical contributions, this research has several managerial implications addressed to public policymakers as well as managers in organizations. First, managers and policymakers should account for AEs and not only emotions related to climate change. AEs are important because they allow individuals to regulate their future behaviors (Baumeister et al., 2007). Managers and public policymakers could consider in their communication individuals reflecting positive/negative emotions on their faces and/or play a soundtrack with a voice-over describing such emotions in response to different pro-environmental behaviors and finally insist on the future benefits of their behaviors in fighting climate change. For instance, positive messages could be as follow: “Feel proud to recycle your waste/ to use public transportation/ to consume X[product/brand], climate change impacts diminish”.

Second, we believe that emotional rewards should be strengthened by increasing the intensity of positive and negative emotions related to positive or negative behavior in favor of the environment. If the most engaged are those who feel positive and negative emotions most intensely, it is possible that by reinforcing positive emotions in particular, we would have a



positive effect on behavior in the fight against global warming. Reinforcing positive emotions can be done in different ways. On the one hand, managers and public policymakers could facilitate individuals' awareness of the positive impact of their actions and thus increase the emotional rewards related to their behaviors (Aknin, Dunn, Whillans, Grant, & Norton, 2013). On the other hand, managers and public policymakers could ease the social sharing of positive emotions felt by individuals either through social networks or through group workshops (Macharis & Kerret, 2019). The reinforcement of NAEs can also be considered since they seem to be effective on the low/non-engaged, as well as on the highly engaged. However, these negative emotions should, in our opinion, be handled with caution because guilt appeals can have negative effects (Peloza, White, & Shang, 2013).

Third, managers and public policymakers could also account for the level of behavioral engagement in environmental protection. Climate change communication specialists should rely on behavioral engagement to target their communication campaigns. Consumers with little behavioral engagement are more sensitive to NAEs such as guilt or shame, whereas those who are moderately engaged are more likely to be influenced by PAEs. Accordingly, there is a need to gear communication strategies or behavioral change programs to the level of engagement. It should also be noted that those very engaged to protect the environment are influenced by both PAEs and NAEs, but this is probably not the main target of communication campaigns.

Finally, managers and public policymakers could reinforce the indirect effects of PAEs by highlighting the ease of acting against climate change. The current research identifies indirect effects through PBC, suggesting that managers and public policymakers should take into consideration not only the emotions associated with climate change behaviors but also PBC. To fully benefit from direct and indirect effects, communication about climate change should emphasize the easy and simple nature of acting daily against climate change; it

should associate these actions with the positive emotions that will be felt by those who act. By accumulating direct and indirect effects, PAEs exert a greater impact on control than do NAEs. Therefore, managers should focus on generating positive emotions in fighting climate change to reinforce the perceived control of consumers who anticipate positive emotions.

## **6. Limitations and suggestions for further research**

This research has limitations that also constitute avenues for future research. In particular, our results may have been influenced by the French context. Risk perceptions related to climate change differ greatly across nations (Lee, Markowitz, Howe, Ko, & Leiserowitz, 2015). Additional cross-cultural studies could test our results. Experimental studies could also verify the causal link between AEs (and more specifically PAEs) and PBC. We might also face a methodological limit related to the design of the questionnaire, which starts with questions about attitudes and concerns related to climate change. This fact might have influenced model-dependent variables, such as PBC or behavioral intentions.

Moreover, the links between emotions and AEs in the context of climate change could be explored more deeply. As Merchant, Ford, and Sargeant (2010) showed with regard to donations, negative emotions such as guilt can generate positive AEs (altruism). Overall, we still know very little about how AEs develop from past emotional experiences. Finally, the interesting result of moderation by behavioral engagement should be examined further to explain why those with moderate engagement are motivated by PAEs, those with low/non-engagement are motivated by NAEs, and those with high engagement are motivated by both PAEs and NAEs. The complexity of the relationships between the explanatory variables and the asymmetry of the influence of predictors according to whether intentions to fight against climate change are moderate or strong suggest that future research involving fsQCA would be useful in identifying combinations that could increase behavioral intentions (Pappas, Kourouthanassis, Giannakos, & Chrissikopoulos, 2016; Pappas, 2018). Indeed, “not doing is

not necessarily the opposite of doing” (Ajzen, 2011, p. 1117), and more generally, that linear models do not sufficiently consider the complexity of decision making (Ockwell et al., 2009) justifies the use of techniques that make it possible to distinguish between the respective and differentiated influences of NAEs and PAEs.

Our research emphasizes the indirect influence of NAEs and PAEs through the PBC. We must examine our results with caution, since the R-squared of PBC is quite low (0.22). Although the partial mediation of PBC is significant for both PAEs and NAEs, PBC remains influenced by other variables not considered in our model. Other factors might influence PBC, such as time, costs, willpower, inconvenience, lack of knowledge about which actions to perform and how to implement them (Ajzen, 2002; Gifford, 2011).

Researchers could also study the impact of communication campaigns that mobilize negative and positive AEs to confirm the ideas that we have developed. We also studied the influence of AEs on PBC, which corresponds to the ease with which individuals believe they can perform the behavior. In the case of the fight against climate change, other forms of efficacy could be studied, such as outcome efficacy (individual action can be effective in fighting climate change) and collective efficacy (collective action can be effective in fighting climate change).

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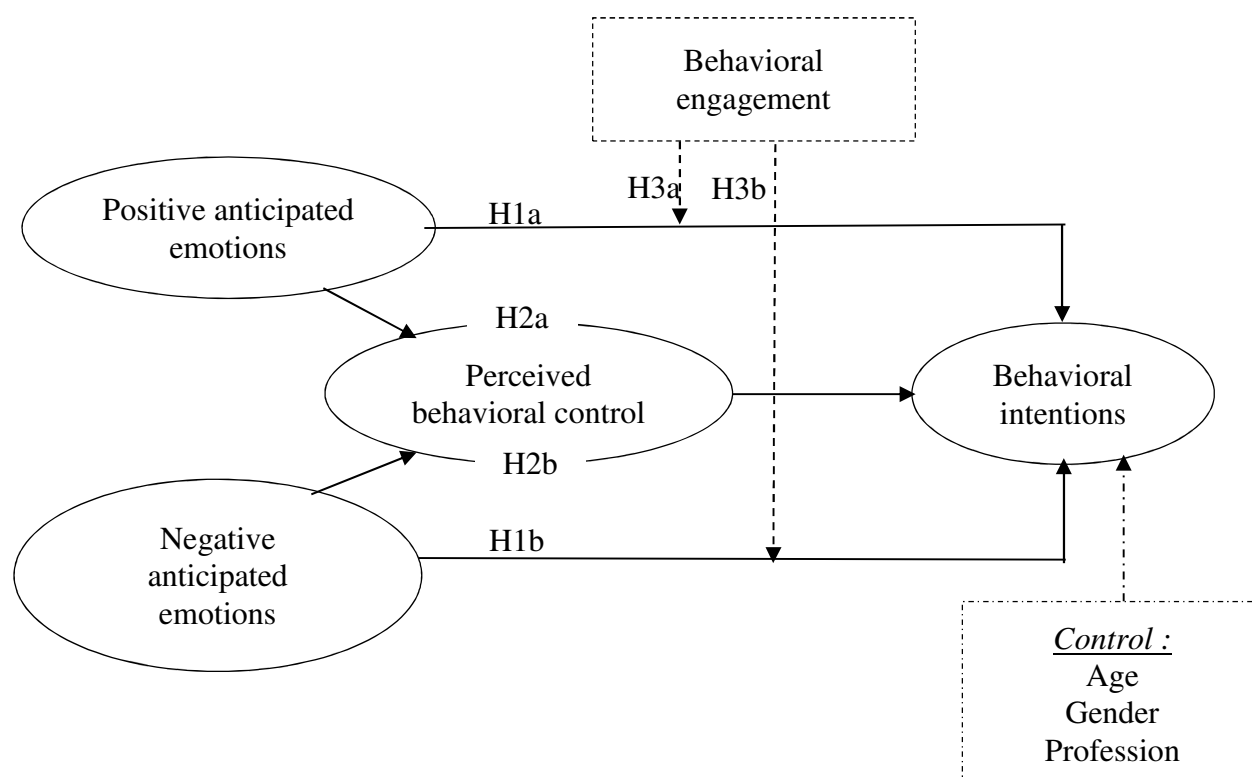
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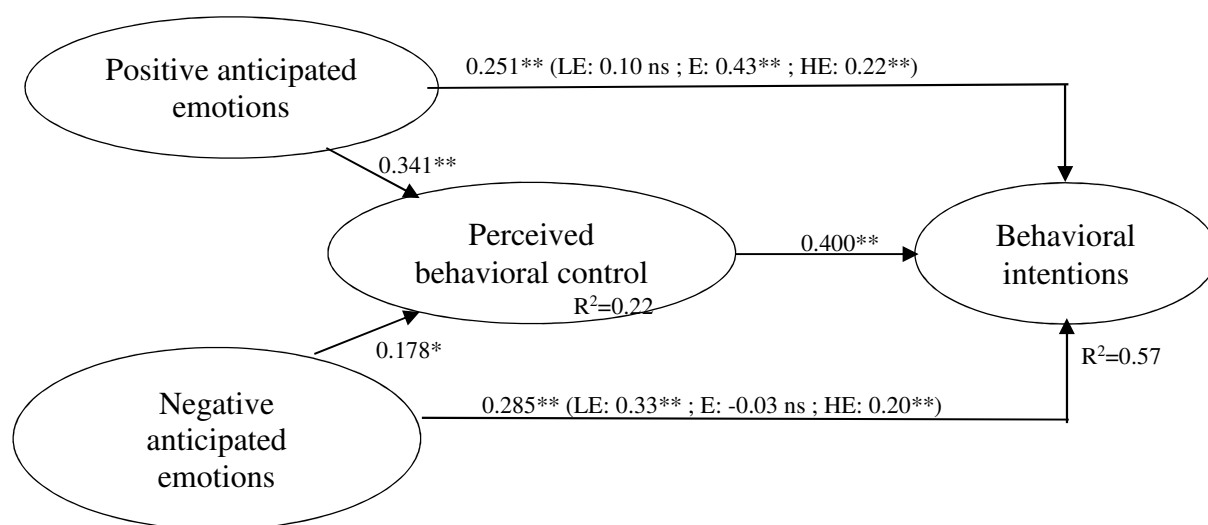
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**Figure 1. Conceptual model with hypotheses**



**Figure 2. Summary of results**

Notes: We present the results for the overall sample, and details in brackets are the effects for each group considered by the moderation (LE: Low/no engagement; E: Engaged; HE: High engagement)

\*  $p < 0.05$

\*\*  $p < 0.01$

**Table 1. Effects of anticipated emotions on behavioral intentions**

Authors	Type of AEs	Behavior(s)	Influence of AEs
Richard, R., Van der Pligt, J., & de Vries, N. (1995)	NAEs	Sexual risk-taking behaviors	NAEs increase the likelihood of preventive behaviors
Richard, R., van der Pligt, J., & de Vries, N. (1996)	AEs toward the behavior No distinction between NAEs and PAEs	Eating junk food/Using soft drugs/Drinking alcohol/Studying hard	AEs influence behavioral activity with negative consequences
Bagozzi, R. P., & Pieters, R. (1998)	PAEs and NAEs	Intentions to diet and exercise	PAEs and NAEs influence intentions to diet and exercise
Perugini, M., & Bagozzi, R. P. (2001)	PAEs and NAEs	Bodyweight regulation	Only NAEs have significant influence
Bagozzi, R. P., Dholakia, U. M., & Basuroy, S. (2003)	PAEs and NAEs	Behaviors related to an important goal, such as reducing smoking, losing weight...	Only NAEs influence goal intentions through goal desires
Abraham, C., & Sheeran, P. (2004)	Anticipated regret	Intentions to exercise	Participants induced to focus on AR have significantly stronger intentions to exercise
Leone, L., Perugini, M., & Bagozzi, R. (2005)	2 NAEs and 2 PAEs	1) Attitudes toward maintaining a diet during the next week. 2) Attitudes toward seeking out social occasions	Moderating effects of regulatory foci (prevention vs promotion) on the influence of NAEs but not for AEs
Chapman, G. B., & Coups, E. J. (2006)	Anticipated worry and regret	Health vaccination decision	Anticipated worry and regret are stronger predictors of vaccination than perceived risk and mediated the effect of risk on vaccination
Hunter, G. L. (2006)	PAEs	Desire to visit a shopping center	Significant influence of PAEs on the desire to visit a shopping center
Hynie, M., MacDonald, T. K., & Marques, S. (2006)	ANSCEs : Anticipated Negative Self-Conscious Emotions (guilt and shame)	Condom use intentions	ANSCEs are partial mediators of the influence of norms and attitudes on intentions
Carrus, G., Passafaro, P., & Bonnes, M. (2008)	PAEs and NAEs	Household recycling	Significant influence of NAEs but not of PAEs
Baumgartner, H., Pieters, R., & Bagozzi, R. P. (2008)	PAEs et NAEs	8 behaviors related to avoiding or limiting the negative outcomes of the millennium transition	NAEs and PAEs are both predictors of behaviors
Dunton, G. F., & Vaughan, E. (2008)	PAEs and NAEs	Health behavior changes (physical activity adoption)	PAEs and NAEs have an influence depending on stage of behavior changes (precontemplation [PC], contemplation [C], preparation [P], action [A], maintenance [M])
Elgaaied (2012)	Anticipated guilt	Recycling	Anticipated guilt influences behaviors
Song, H. J., Lee, C. K., Kang, S. K., & Boo, S. J. (2012)	NAEs and PAEs	Tourism desires for revisiting a mud festival	Influences of PAEs but not NAEs
Wang, X., & McClung, S. R. (2012)	Anticipated guilt and PAEs	Intentions to download	Anticipated guilt and PAEs influenced intentions to download
Onwezen, M. C., Antonides, G., & Bartels, J. (2013)	Anticipated pride and guilt	Pro-environmental intentions	Anticipated pride and guilt mediate the effects of personal norms on behavior
Kim, Y. J., Njite, D., & Hancer, M. (2013)	Anticipated regret	Intentions to select eco-friendly restaurants	Anticipated regret influences consumer intentions to select eco-friendly restaurants
Hur & Jang (2015)	Anticipated guilt and pleasure	Healthy food consumption	Anticipated pleasure but not anticipated guilt influences behavioral intentions

Bagozzi, R. P., Belanche, D., Casaló, L. V., & Flavián, C. (2016)	PAEs and NAEs linked to both action and inaction	Purchase intentions	PAEs and NAEs linked to both action and inaction have a significant influence on purchase intentions
Meng & Han (2016)	PAEs and NAEs	Bike traveling	Only PAEs have a significant influence on behavioral intentions
Troop (2016)	Anticipated pride and anticipated shame	Dietary restraint	Anticipated shame with weight gain and anticipated pride with weight loss predict higher levels of dietary restraint
Gilchrist, J. D., Conroy, D. E., & Sabiston, C. M. (2017)	Anticipated pride and shame	Individuals training for a long-distance race	Anticipated pride but not anticipated shame is a significant predictor of training time and efforts
Rezvani, Z., Jansson, J., & Bengtsson, M. (2017)	PAES and NAEs	Intentions to adopt electric cars	Both PAEs and NAEs mediate the influence of personal norms on intentions to adopt electric cars

**Table 2. Sociodemographic characteristics of the sample**

	Sample (N = 516)
<u>Gender</u>	
Men	280 (54.3%)
Women	236 (45.7%)
<u>Age</u>	
18-24	253 (49.1%)
25-39	148 (28.7%)
40-54	71 (13.6%)
≥ 55	44 (8.6%)
<u>Profession</u>	
Liberal profession (independent retailers, artisans, and medical practitioners)	33 (6.4%)
Executive (business executives, executive managers)	74 (14.4%)
Employee	141 (27.3%)
Retiree	25 (4.8%)
Student	223 (43.2%)
Other	20 (3.9%)

**Table 3. Psychometric properties of the scales**

	Item codes	Item loadings	Composite reliability	Convergent validity (AVE)	Square root of AVE	Correlations (lower left corner) and squared correlations (upper right corner)			
						1.	2.	3.	4.
1. Perceived behavioral control (Cronbach's alpha value $\alpha = 0.90$ ; M = 4.28; SD = 1.5)	PBC1 PBC2	$\lambda = 0.93$ $\lambda = 0.89$	$R\hat{\rho} = 0.91$	AVE = 0.83	0.91		0.20	0.14	0.38
2. Positive anticipated emotions (Cronbach's alpha value $\alpha = 0.91$ ; M = 4.23; SD = 1.65)	PAE1 PAE2 PAE3 PAE4	$\lambda = 0.81$ $\lambda = 0.91$ $\lambda = 0.90$ $\lambda = 0.73$	$R\hat{\rho} = 0.91$	AVE = 0.71	0.84	0.45		0.36	0.36
3. Negative anticipated emotions (Cronbach's alpha value $\alpha = 0.90$ ; M = 3.2; SD = 1.70)	NAE1 NAE2 NAE3 NAE4	$\lambda = 0.78$ $\lambda = 0.91$ $\lambda = 0.91$ $\lambda = 0.75$	$R\hat{\rho} = 0.91$	AVE = 0.71	0.84	0.38	0.60		0.35
4. Behavioral intentions (Cronbach's alpha value $\alpha = 0.92$ ; M = 3.96; SD = 1.80)	BINT1 BINT2	$\lambda = 0.91$ $\lambda = 0.92$	$R\hat{\rho} = 0.91$	AVE = 0.84	0.92	0.62	0.60	0.59	

*Notes:* For construct discriminant validity, the average variance extracted (AVE) values must be greater than the squared correlations between constructs, which was the case for all constructs. The discriminant validity was also satisfactory.

**Table 4. Moderation effect of behavioral engagement**

	Low/no-engaged N = 182	Engaged N = 170	High-engaged N = 164
Positive anticipated emotions → behavioral intentions ( $\Delta\chi = 9.44$ , $df = 2$ , $p < 0.01^*$ )	$\gamma = 0.10$ ns	$\gamma = 0.43^{**}$	$\gamma = 0.22^{**}$
Negative anticipated emotions → behavioral intentions ( $\Delta\chi = 8.57$ , $df = 2$ , $p < 0.05^*$ )	$\gamma = 0.33^{**}$	$\gamma = -0.03$ ns	$\gamma = 0.20^{**}$
Model fit indices	$\chi^2 = 313.53$ , $df = 144$ , $p < 0.001$ ; RMSEA = 0.048; CFI = 0.96; TLI = 0.94; $\chi^2/df = 2.18$		
Predictive power ( $R^2$ )	0.43	0.51	0.54

Notes: \* A chi-square difference test of each individual path of interest revealed significant differences in the moderation effects across the three groups of behavioral engagement; \*\*  $p < 0.01$ ; ns non-significant.

### Appendix 1. Measurement items and sources

Constructs	Measurement items	Sources
Perceived behavioral control	Acting against climate change on a daily basis is	Carrus et al. (2008)
	PBC1. Difficult/Easy	
	PBC2. Complicated/Simple	
Positive anticipated emotions	If during the next two weeks you will act against climate change, how much do you think you would feel ...	Carrus et al. (2008)
	PAE1. Delighted	
	PAE2. Happy	
	PAE3. Glad	
	PAE4. Proud	
Negative anticipated emotions	If during the next two weeks you will not act against climate change, how much do you think you would feel ...	Carrus et al. (2008)
	NAE1. Angry	
	NAE2. Unsatisfied	
	NAE3. Discontented	
	NAE4. Disappointed	
Behavioral intentions	BINT1. During the next two weeks, I will act against climate change on a daily basis.	Carrus et al. (2008)
	BINT2. During the next two weeks, I intend to act against climate change on a daily basis.	
Behavioral engagement	Buying environmentally friendly products, reducing household waste, using products made from recycled material, buying organic food, reducing household energy consumption, using public transportation, buying local products	Kilbourne and Pickett (2008)