



Willingness to pay more for green products: The interplay of consumer characteristics and customer participation

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ARTICLE INFO

Keywords:

Customer participation
Green products
Willingness to pay more

ABSTRACT

The extant evidence evaluating consumers' willingness to pay more for green products has been mixed. Existing investigations stem from an overemphasis on profiling consumers who are willing vs. unwilling to pay price premiums for green products using dispositional (socio-demographic and psychological) characteristics. However, little is known about what firm-initiated actions can be taken when consumers do not possess characteristics that favorably influence green purchase behaviors. This research demonstrates that customer participation improves consumers' willingness to pay more even when consumers exhibit low sustainability-oriented motivation (environmental concern) and ability (eco-literacy). The findings are important for practitioners seeking practical ways to alleviate green purchase barriers.

1. Introduction

The 21st-century business landscape is challenged by greater demands for environmental corporate accountability. Today, businesses receive increased pressure from stakeholders (community members, supply chain partners, etc.) to incorporate an environmental sustainability agenda into their corporate strategies (Johnstone and Tan, 2015). "The goals of social good and business success are no longer an either/or proposition but are being increasingly interwoven into an 'ecopreneuring' paradigm" (Pujari et al., 2003, p. 658). In fact, more and more firms have spent significant financial resources to develop and produce green products. For example, General Motors is estimated to spend upwards of \$2.5 billion a year on R&D for alternative energy vehicles (Gleim et al., 2013). Similarly, Mark & Spencer, a UK-based department store chain, has spent more than \$50 million in re-creating a sustainable supply chain operation (e.g., using only sustainable raw materials) (Wheeland, 2016).

However, despite costly sustainable initiatives implemented by firms, the extant evidence evaluating consumers' willingness to more (WTPM) for green products has been mixed. For example, one study found that the most concerned Spanish consumers were willing to pay a price premium of 22–37% for green food products (Sanjuán et al., 2003). Japanese consumers were reported to be willing to pay a premium of 8–22% for green food products (Sakagami et al., 2006). Vladicka and Cunningham (2002) found that most Canadian respondents were willing to pay 10% more for green products, but the

WTPM of Argentinean consumers was in a highly broad range of 6–300% (Rodríguez et al., 2009). To complicate things even further, Van Ravenswaay and Jennifer (1995) asserted that highly educated consumers did not show WTPM for green food products because these consumers are savvy in obtaining information on food risks and benefits. Canavari et al. (2002) also argued that some consumers were not willing to pay price premiums for free-of-pesticide products because these consumers believed that people should not have to pay more for product safety.

The nonconclusive nature of these findings and the wide range of reported WTPM are concerning, because the success of the firms' sustainability-directed marketing strategies depends on consumers' uptake of green products. Given that WTPM is a key barrier that impedes green purchase, it is imperative to identify marketing actions that can alleviate this barrier. Yet, scant research exists on effective corporate strategies in regards to improving consumers' WTPM for green products. Previous research on WTPM is dominated by profiling green vs. non-green consumers using dispositional (socio-demographic and psychological) characteristics. Consumer characteristics predicting a propensity to pay premiums for green products include: motivational factors (e.g., environmental concern), abilities (e.g., eco-literacy), cultures (e.g., individualism and collectivism), and socio-demographic variables (e.g., education and income) (e.g., Kang et al., 2012; Laroche et al., 2001; Sanjuán et al., 2003). Although these findings have provided valuable insights, little is known about what firm-initiated actions can be taken when consumers do not possess characteristics that favorably

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influence green purchase behaviors. For example, what practical strategies are available if consumers have low sustainability-oriented motivation and ability? Such an inquiry is critical because it is difficult to directly alter consumer characteristics.

To address these research gaps, this study investigates customer participation or CP (i.e., customer's involvement during product design and delivery) as an effective firm-initiated strategy to increase green purchase. Specifically, we examine how CP interacts with consumer characteristics in the form of sustainability-oriented motivation (environmental concern) and ability (eco-literacy) to jointly influence perceived consumer effectiveness or PCE (cognitive response), and ultimately WTPM for green products (behavioral response). The effects of CP in products and services—positive, negative, and nonsignificant—have been documented in the marketing literature (Dong and Sivakumar, 2017), but little is known about its role in the context of green purchase. This study attempts to explore the potential positive impact CP has on green purchase even when consumers do not possess sustainability-oriented characteristics. Unique to this study is the indication that firm-initiated inventions (e.g., involving consumers to co-create a product) to promote pro-environmental behaviors do not have to be explicit requests as documented in the previous environmental research (e.g., the spillover literature). The findings of this study have important implications for green marketers seeking practical ways to increase consumers' WTPM.

2. Theoretical background and hypotheses

This research defines green products as “products that consumers perceive to be environmentally friendly, whether it is due to the production process, the types of materials or ingredients used to manufacture the product, packaging, marketing communication and so on” (Johnstone and Tan, 2015, p. 312). WTPM is operationalized as consumers' willingness to pay premium prices for the green version of a product. This study draws from a consumer characteristics model (Moorman and Matulich, 1993), which postulates that, the right consumer characteristics in the form of motivation (e.g., environmental concern) and ability (e.g., eco-literacy), drive favorable cognitive (e.g., PCE) and behavioral (e.g., WTPM for green products) responses. Particularly, this study investigates how CP, a firm-initiated strategy, interacts with consumer characteristics to influence cognitive and behavioral responses (see the conceptual model in Fig. 1).

2.1. Consumer characteristics

Consumers differ in their responses to green products according to dispositional consumer characteristics (Sreen et al., 2018). According to the consumer characteristics model (Moorman and Matulich, 1993),

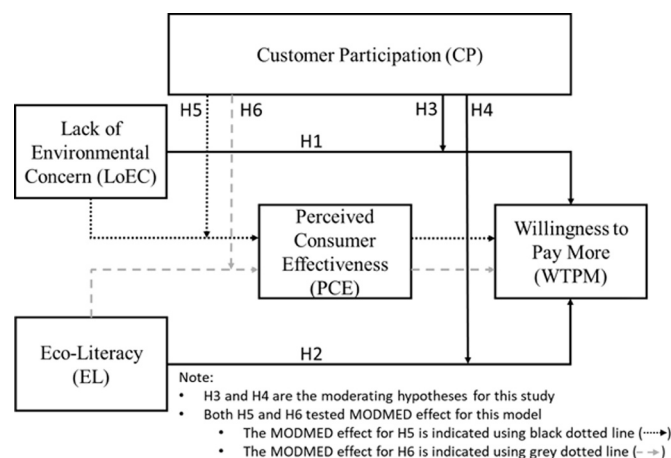


Fig. 1. Conceptual Model.

two general categories of consumer characteristics stressed as important preconditions for cognitive and behavioral changes are motivation and ability. Each characteristic is viewed as a resource that consumers exhibit to varying degrees. In the green purchase context, two consumer characteristics spotlighted as important predictors of varying cognitive and behavioral responses are environmental concern (motivation) and eco-literacy (ability) (Schmuck et al., 2018).

Environmental concern and eco-literacy are indicators of environmental involvement, a critical influencer of consumers' responses to green products (Schmuck et al., 2018). Environmental concern refers to a consumer's general attitude toward preserving the environment (Ellen et al., 1991). Stern (2000) classified pro-environmental behaviors as intent or non-intent oriented. According to the intent-oriented perspective, the consumer's behavior is driven by his/her motivation to benefit or change the environment, which depends on attitudinal variables (e.g., environmental concern). Our study adopts the intent-oriented perspective, because the non-intent-oriented perspective does not focus on people's beliefs and motives to understand and change the target behaviors. Environmental concern has been shown as a strong predictor of pro-environmental behaviors, such as purchasing ecologically packaged products, recycling, and engaging with environmental groups (Ellen et al., 1991; Schwepker and Cornwell, 1991).

Eco-literacy refers to the extent to which consumers understand environmental issues and eco-friendly products (Cheah and Phau, 2011). Knowledge as it relates to consumer seeking, searching, and using information plays a pivotal role in the consumer purchase decision process. The credence nature of green or sustainable products particularly calls for consumers to be aware of current environmental issues, yet, few consumers truly have deep comprehension of sustainability-related issues. Eco-literacy can be conceptualized as either objective or subjective knowledge about the environment. According to Amyx et al. (1994), eco-literacy as objective knowledge is the consumer's ability to identify/define a number of ecologically-related symbols and concepts, assessed by performance on factual tests. In contrast, eco-literacy as subjective knowledge is the consumer's perception of the amount he/she knows in the ecological domain, measured by self-evaluation and self-report of knowledge. Subjective knowledge involves the consumer's self-confidence in the adequacy of his/her knowledge level.

Objective and subjective knowledge are distinct and weakly correlated (Amyx et al., 1994). What consumers actually know typically does not represent what they perceive they know. Previous research exploring eco-literacy and pro-environmental behaviors has mixed findings, partly depending on the conceptualization of eco-literacy. For example, Laroche et al. (2001) concluded that eco-literacy, measured as objective knowledge, was not a good predictor of WTPM for green products. They called for a replication study with eco-literacy measured as subjective knowledge. Amyx et al. (1994) found that eco-literacy, measured as subjective knowledge, was the strongest predictor of WTPM for green products in their model. In light of this evidence, this study will adopt the subjective approach.

2.2. The impact of consumer characteristics on WTPM

A fundamental impediment to environmentally responsible behaviors stems from a lack of environmental concern (i.e., negative attitudes toward the behaviors) (Cheah and Phau, 2011). Individuals with negative attitudes toward preserving the environment (low environmental concern) are less likely to engage in pro-environmental behaviors than individuals with positive attitudes toward preserving the environment (high environmental concern) (Paul et al., 2016). This research re-evaluates a similar line of reasoning by proposing H1. Aside from environmental concern, eco-literacy is another major predictor of pro-environmental behaviors (Amyx et al., 1994). Consumers high (vs. low) in eco-literacy are more likely to show WTPM for green products (Amyx et al., 1994). Thus, a similar line of logic is re-examined here

(H2).

H1. A lack of environmental concern negatively relates to WTPM for green products.

H2. Eco-literacy positively relates to WTPM for green products.

2.3. The moderating effects of CP

CP refers to the extent to which consumers are involved in the production and delivery of goods and services by contributing effort, knowledge, information, and other resources (Dong and Sivakumar, 2017). Many firms have commercialized user design by having websites that allow consumers to design their T-shirts, computers, sneakers, watches, and so forth, which the firms can then produce to order (Franke et al., 2010). The ultimate outcome of such co-production is co-creation of value. Consumers are no longer passive recipients of products; they are active participants to create a customized consumption experience for themselves.

An intriguing question is whether CP can mitigate the negative influence of a lack of environmental concern on WTPM for green products. The literature suggests that CP may alter one's attitude toward the stimulus product and purchase intention. For example, an "IKEA effect" or an "I designed it myself" effect has been documented, suggesting that people perceive self-created or self-designed products to be more valuable than identical products built by others, even for mundane products (Franke et al., 2010; Norton et al., 2012). Such overvalue should lead to WTPM. Thus, we argue that when consumers are involved more (vs. less) in the design and delivery process of a green product, their initial negative attitudes toward the product may be weakened. That is, even if some consumers are not concerned about the environment in general, a higher level of CP may induce them to place higher value on the green product they co-create, manifested in WTPM for the product (H3).

H3. The negative relationship between a lack of environmental concern and WTPM for green products is moderated by CP such that the negative relationship is weaker (stronger) when CP is high (low).

Can CP strengthen the positive relationship between eco-literacy and WTPM for green products? Coproduction tasks require consumers to invest time, thought and effort, and consumers generally perceive such tasks as positive and meaningful challenges (Mende et al., 2017). Consumers low in service literacy (i.e., low domain-specific expertise related to a coproduction task) are particularly challenged by high coproduction workload (Mende et al., 2017). Logically, consumers with low (vs. high) service literacy need to spend more effort and other resources to achieve the same, high-level coproduction task. Given that people can assess an effortful task and its outcome more positively (Labroo and Kim, 2009), consumers with low (vs. high) literacy may view a high-level coproduction task to be a more positive and meaningful challenge. This will likely be associated with increased valuation of the coproduction tasks because people place a high value (including economic value) on their own hard work (Cutright and Samper, 2014). Expanding this idea, this research maintains that CP positively moderates the relationship between eco-literacy and WTPM (H4).

H4. The positive relationship between eco-literacy and WTPM for green products is moderated by CP such that the positive relationship is stronger (weaker) when CP is high (low).

2.4. The mediating role of PCE moderated by CP

PCE refers to the degree to which consumers believe that their actions can make a difference in solving environmental problems (Roberts, 1996). Unlike attitudinal variables (e.g., environmental concern) that involve an evaluation of the issue at hand, PCE involves an

evaluation of the self in the context of the issue. Past research found that without PCE, environmental concerns might not be directly translated into pro-environmental behaviors (Ellen et al., 1991), indicating a potential mediating role of PCE.

Individuals' behavior is influenced by their confidence in their capabilities to change certain outcomes (Roberts, 1996). PCE (efficacy beliefs) has been spotlighted as a strong and even necessary influencer of green purchase behaviors (Wesley et al., 2012). Psychologists suggest that efficacy beliefs are usually triggered by certain perceived threat/danger and concerns. For example, in the context of health behavior, "a minimum level of threat or concern must exist before people start contemplating the benefits of possible actions and ruminate their competence to actually perform them" (Schwarzer, 1992, p. 235). Thus, one can expect that the perception of an environment in danger motivates consumers to assess whether their own actions will have a significant impact on bringing about change. By the same token, consumers who do not perceive an environmental danger (lack environmental concern) may not be motivated to ponder upon their control over environmental outcomes. That is, we suggest that environmental concern may precede PCE.

In addition to environmental concern, past research suggests that eco-literacy also precedes PCE (Kim and Choi, 2005). As Ozer and Bandura (1990) noted, "people often fail to perform optimally even though they know what to do and possess the requisite skills. This is because self-referent thought mediates the translation of knowledge and abilities into proficient performance" (p. 473). Put differently, efficacy beliefs operate as a cognitive mediator of action. Individuals must believe that they have the necessary knowledge and skills to perform certain behaviors (which is different from the mere fact that they have the required knowledge and skills) before they feel comfortable carrying out the behaviors. In the green consumption context, as one's eco-literacy increases, PCE will increase as well (Kim and Choi, 2005).

Preceded by environmental concern and eco-literacy, PCE has been consistently linked to pro-environmental behaviors. Before individuals would perform certain pro-environmental behavior, they had to believe that their actions were going to have an impact (Roberts, 1996). "When people believe that they have the power to act and that such actions can have positive results, they are more inclined to take said action. In order for this to occur, individuals must believe that their own personal efforts can contribute to the solution of a problem" (Wesley et al., p. 34). Thus, it is reasonable to speculate PCE as a pathway through which environmental concern or eco-literacy can be translated to WTPM for green products. That is, PCE mediates (1) the path between environmental concern and WTPM and (2) the path between eco-literacy and WTPM. We further expect that CP has beneficial moderating effects for the aforementioned mediating effects (H5 and H6).

H5. The indirect effect of a lack of environmental concern on WTPM for green products, through PCE, is moderated by CP, such that the indirect effect is weakened when CP is high than when CP is low.

H6. The indirect effect of eco-literacy on WTPM for green products, through PCE, will be moderated by CP, such that the indirect effect will be strengthened when CP is high than when CP is low.

3. Methodology

3.1. Study design and procedure

A hypothetical online custom T-shirt purchase situation is the study context. Custom T-shirt purchase is a prime example of CP (Franke et al., 2010). Previous research (Heidenreich et al., 2015) has used hypothetical online custom apparel and shoes purchase situations to effectively manipulate the degree of CP, due to participants' familiarity with the context. Thus, we used a scenario-based experiment. Before

exposure to CP manipulation, all participants were asked to fill out questions pertaining to their degree of environmental concern and eco-literacy.

Then, participants were randomly assigned to either high or low CP condition. All participants imagined that they were going to purchase a custom T-shirt through an online store, MivoCustomShirt.com (a fictional store to eliminate prior attitudes toward a real store). Following Heidenreich et al. (2015) and Mende et al. (2017), we manipulated the level of CP by differing degrees of information and effort required from participants to design the T-shirt. In the high CP condition, participants had to invest a substantial amount of time and effort to customize their shirt. Participants were allowed to customize by selecting specific color, type of collar, art to be printed, and words to be printed on the shirt. Many options were available for each customization. Specifically, participants had 16 colors options, 9 collar options, 16 art options, and the ability to free-write words (limit: 7 words) to be printed on the shirt (see Fig. 3a). To further induce feelings of high CP, participants were asked to type in (vs. simply clicking on) their choices. In contrast, participants in the low CP condition were only allowed to customize based on color, type of collar, and art to be printed on the shirt. Limited choices were provided for each customization. Specifically, 4 basic colors, 3 basic collars options and 4 most popular art categories were offered (see Fig. 3b). To further elicit feelings of low CP, participants were asked to simply click on (vs. typing in) their choices.

Once all participants in both conditions finished the customization process, they were informed that they could now purchase their T-shirt with either regular or eco-friendly materials. Participants were assured that both materials have the same high quality. Participants also learned that they must spend more if they want to purchase their shirt with eco-friendly materials. Finally, all participants were asked to indicate their PCE, WTPM for a T-shirt made from eco-friendly materials, measures for manipulation check, and demographic questions.

3.2. Data collection

Data was collected using Amazon Mechanical Turk, an online consumer panel frequently used in marketing research. A sample of 380 respondents was recruited, and 46 responses identified as straightliners and incompletes were excluded. Thus, a total sample of 334 respondents ($n_{hiCP} = 177$ and $n_{loC} = 157$) was retained. The sample consisted of 55.7% male with a majority (53%) of them ranging in ages from 31 to 50. Caucasian Americans (73.7%) represented the largest ethnicity and individuals with bachelor's degree had indicated the largest educational attainment (45.2%) (see Table 1 for more detailed information regarding the demographic characteristics).

3.3. Measurement of constructs

All the measures were adapted from established scales and were measured on Likert scale (1–7; strongly disagree–strongly agree). The scale of lack of environmental concern was measured using four items adapted from Ellen et al. (1991) and Schwepker and Cornwell (1991). We measured eco-literacy using five items adapted from Mende et al. (2017). The construct customer participation was measured using three items adapted from Heidenreich et al. (2015). The last two constructs, perceived consumer effectiveness and willingness to pay more for green products, were measured using five items (adapted from Kim and Choi, 2005; Roberts, 1996; Wesley et al., 2012) and four items (adapted from Laroche et al., 2001) respectively.

We conducted Harman's single factor test to check for common method variance (CMV). The test revealed that the first factor accounted for 41.1% variance with no single factor emerged, meaning that no single factor explained the majority of the variance (over 50%). We also ran a common latent factor test. The result did not show any differences above .2 between standardized regression estimates for both models. Taken together, there is little evidence of substantial CMV

Table 1
Respondent demographic profile.

Demographic Variable	Percentage
Gender	
Male	55.7%
Female	44.3%
Age (in years)	
18–30	32.6%
31–40	35.6%
41–50	17.4%
51 or above	14.4%
Ethnicity	
African American	8.1%
Asian	12.8%
Hispanic	4.5%
White	73.7%
Others	0.9%
Education	
Less than High School	0.3%
High School Graduate	11.9%
Some College	22.8%
Associate Degree	14.7%
Bachelor's Degree	45.2%
Master's Degree	3.9%
Professional Degree	1.2%

(Podsakoff et al., 2003).

4. Results

To ensure that CP manipulation worked as intended, all participants were asked to rate three manipulation check items measuring the level of CP (see Table 2). The results show that participants in the high (vs. low) CP condition perceived a higher level of participation ($CP_{high} = 5.194$; $CP_{low} = 2.176$; $p < 0.001$), indicating a successful manipulation.

4.1. Reliability and validity

Confirmatory factor analysis was conducted to examine the measurement model fit. The results indicate that the measurement model has a good fit ($\chi^2 = 475.369$, $df = 198$, $p < 0.001$; $RMSEA = 0.065$; $CFI = 0.952$; $NFI = 0.920$). Other indicators also demonstrate a good measurement model. All the values of Cronbach's alpha and composite reliability exceed .80, which surpass the recommended threshold required to demonstrate convergent validity (Hair et al., 2010). The factor loadings for all the items are statistically significant ($p < 0.001$) with the beta (β) exceeding 0.70, providing further demonstration of convergent validity. Finally, the average variance extracted (AVE) value for each of the variables is greater than its corresponding squared interconstruct correlation, providing evidence for discriminant validity (Fornell and Larcker, 1981). The values for all the aforementioned indicators are shown in Table 3.

4.2. The moderated mediation effect

We are studying the effects of lack of environmental concern (LoEC) and eco-literacy (EL) on WTPM, moderated by CP and mediated by PCE (Fig. 1). To test a moderated mediation (MODMED) model, PROCESS was utilized (Hayes, 2013). Specifically, model 1 and 7 (5000 bootstrap samples, 95% CI) were used. PROCESS Macro is a versatile OLS regression path analysis modeling tool that can effectively and easily analyze complex models (e.g., a moderated mediation model) in one structure using bootstrapping CIs (Hayes, 2013). SPSS with PROCESS was applied.

4.2.1. Outcomes of LoEC (Lack of environmental concern)

There are three steps in establishing a MODMED model. The first

Table 2
Measurement of constructs.

Items	Standardized Factor Loadings	
	β (Beta)	t-value
Lack of Environmental Concern (adapted from Ellen et al., 1991; Schwepker and Cornwell, 1991)		
Environmental problems are not affecting my life personally.	0.781	11.243
I have too many obligations to take an active part in an environmental organization.	0.745	11.192
I can think of many things I'd rather do than work toward improving the environment.	0.762	10.781
When I buy products, I try to consider how my use of them will affect the environment and other consumers. (R)	0.821 ^a	
Eco-literacy (adapted from Mende et al., 2017)		
I have good knowledge about environmental issues.	0.765	16.287
I know a great deal about environmental matters.	0.787	17.062
I know a lot of about environmentally friendly products sold in the marketplace.	0.750	15.891
I am comfortable reading environmental safety information on product labels without any assistance.	0.841	18.956
How confident are you in discussing environmental issues with others? (1 = very confident, 7 = not at all confident)	0.804 ^a	
Customer Participation (adapted from Heidenreich et al., 2015)		
This online retailer offered me many options to customize the t-shirt to my needs and taste.	0.768	12.872
Because of the many options and requests, I had to spend a lot of time and energy in order to design the t-shirt properly.	0.894	13.206
I had to provide a lot of information about my needs and opinions during the t-shirt design process.	0.722 ^a	
Perceived Consumer Effectiveness (adapted from Kim and Choi, 2005; Roberts, 1996; Wesley et al., 2012)		
I feel capable of helping solve the environmental problems.	0.956	15.589
I can protect the environment by buying products that are friendly to the environment.	0.963	23.143
I feel I can help solve environmental problems by buying environmentally friendly products.	0.905	22.751
What I purchase as a consumer has an effect on the nation's environmental problems.	0.861	20.741
Each consumer's behavior can have a positive effect on society by buying products that are friendly to the environment.	0.903	22.660
Any individual person can make a difference in the quality of the environment by choosing products carefully.	0.851 ^a	
Willingness to Pay More for Green Products (adapted from Laroche et al., 2001)		
I would pay more for custom t-shirts that are made using environmentally friendly materials.	0.956	20.427
I am willing to spend more money in order to buy custom t-shirts that are environmentally friendly.	0.963	20.576
I believe it is acceptable to pay 25% more for custom t-shirts that are made using environmentally friendly materials.	0.780	25.510
I believe it is acceptable to spend extra money for t-shirts that are made using environmentally friendly materials.	0.776 ^a	

1) Unless otherwise stated in the table, all the items were measured using a seven-point scale anchored by 1 = “strongly disagree” and 7 = “strongly agree”.

^a Fixed parameter.

step examines the impact of LoEC on WTPM, moderated by CP. The result shows a significant negative relationship between LoEC and WTPM ($b = -0.802$; $p < 0.001$, LLCI = -0.907 , ULCI = -0.697), supporting H1. That is, the more a consumer has a negative attitude toward preserving the environment, the less likely he/she will be willing to pay more for green products. The result also reveals that the negative relationship between LoEC and WTPM is significantly moderated (mitigated) by CP ($b = 0.075$; $p < 0.05$, LLCI = 0.010 , ULCI = 0.141), such that the negative effect of LoEC on WTPM is weaker when CP is higher (see Fig. 2), therefore supporting H3. This means that a higher level of customer participation reduces the negative effect lack of environmental concern has on WTPM.

The second step examines the relationship between LoEC on PCE, moderated by CP. The result shows a significant negative relationship between LoEC and PCE ($b = -0.552$; $p < 0.001$, LLCI = -0.659 , ULCI = -0.445). This mean that the more a consumer has a negative attitude toward preserving the environment, the less likely that he/she will believe that his/her actions can make a difference in solving environmental problems. However, we did not find a significant moderating effect of CP on the relationship between LoEC and PCE ($b = -0.016$; $p > 0.05$, LLCI = -0.078 , ULCI = 0.460). That suggests that

contrary to our hypothesis, a higher level of customer participation does not make consumers feel that their actions will have a greater impact on solving environmental problems. The last step finalizes the MODMED model (H5). However, since the result in the previous step was non-significant, it is expected that the result will not reveal a significant MODMED model of the indirect relationship between LoEC and WTPM through PCE, at different levels of CP (LLCI = -0.026 , ULCI = 0.017). Thus, H5 is not supported (see Table 5 for the result). This means that contrary to our hypothesis, a higher level of customer participation does not increase consumers' WTPM for green products through an increased feeling that their actions will have a greater impact on solving environmental problems.

4.2.2. Outcomes of EL (Eco-Literacy)

Similarly, the first step examines the impact of EL on WTPM, moderated by CP. The result indicates a significant positive relationship between EL and WTPM ($b = 0.662$; $p < 0.001$, LLCI = 0.519 , ULCI = 0.805), supporting H2. This means that the more a consumer understands environmental issues and eco-friendly products, the more likely that he/she will be willing to pay more for green products. However, the result does not support the moderating effect of CP on the

Table 3
Psychometric properties and correlation matrix.

Variable	Mean	SD	AVE	CR	1	2	3	4	5
Willingness to Pay More (WTPM)	4.562	1.635	0.763	0.927	0.938				
Lack of Environmental Concern (LoEC)	3.483	1.312	0.605	0.810	-0.751	0.810			
Eco-Literacy (EL)	3.411	1.160	0.624	0.892	0.539	-0.562	0.902		
Customer Participation (CP)	4.103	1.515	0.637	0.839	0.104	0.148	-0.004	0.835	
Perceived Consumer Effectiveness (PCE)	4.941	1.318	0.742	0.945	0.559	-0.635	0.462	-0.116	0.943

N = 334.

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

AVE means Average Variance Extracted; CR means Composite Reliability.

Cronbach's alpha provided in diagonal; Inter-construct correlations provided in subdiagonal.

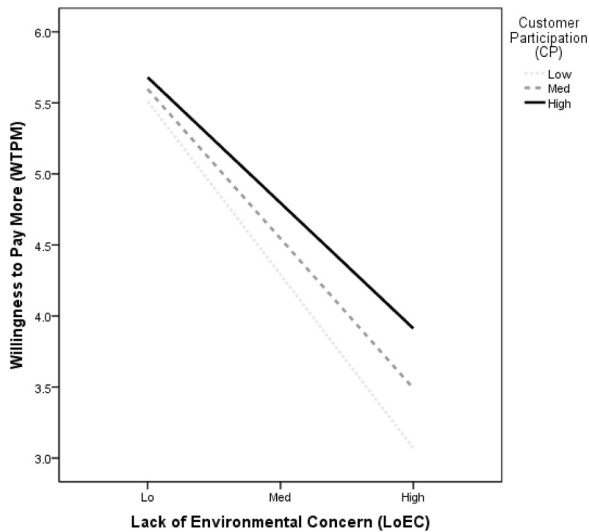


Fig. 2. The Interactive Effect of Lack of Environmental Concern and Customer Participation on Willingness to Pay More.

Note: The values (1–7) for LoEC, CP and WTPM are as follows (Med = Mean; the low and high values are one standard deviation apart from Mean):

- CP (Low: 2.068, Med: 3.775, and High: 5.483)
- LoEC (Low: 2.171, Med: 3.483, and High: 4.794).

relationship between EL and PCE ($b = 0.045$; $p > 0.05$, $LLCI = -0.036$, $ULCI = 0.125$). Thus, H4 is not supported. This means that contrary to our hypothesis, a higher level of customer participation does not help consumers with low environmental knowledge to feel that their actions will have a greater impact on solving environmental problems.

The second step examines the relationship between EL on PCE, moderated by CP. The result shows a positive relationship between EL and PCE ($b = 0.503$; $p < 0.001$, $LLCI = 0.381$, $ULCI = 0.624$). This means that the more a consumer understands environmental issues and eco-friendly products, the higher likely he/she believes that his/her actions can make a difference in solving environmental problems. As expected, the result reveals that CP is a significant moderator for the positive relationship between EL and PCE. That is, the higher the CP, the stronger the positive relationship between EL and PCE ($b = 0.108$; $p < 0.01$, $LLCI = 0.037$, $ULCI = 0.178$). Before demonstrating the MODMED effect (H6), it is necessary to find out the relationship between PCE and WTPM. The result shows a significant positive relationship between PCE and WTPM ($b = 0.519$; $p < 0.001$, $LLCI = 0.399$, $ULCI = 0.637$), which means that the more he/she believes that his/her actions can make a difference in solving environmental problems, the higher likelihood that he/she will be willing to pay more for green products. Table 4 shows the results for H1 to H4.

Finally, the last step formalizes the MODMED effect of H6. The magnitude of the conditional indirect effects (via the mediator: PCE) of the independent variable (EL) on the dependent variable (WTPM) at different levels of moderator (CP) was calculated. Table 5 displays the conditional indirect effect at three values of CP: one standard deviation below the mean (-1), the mean, and one standard deviation above the mean (+1). According to Table 5, the result shows that this relationship is statistically significant conditional indirect effect (mediated by PCE) between EL and WTPM, at three levels of CP ($LLCI = 0.0203$; $ULCI = 0.0973$). This significant conditional indirect effect is indicated by the same sign of LLCI and ULCI. Moreover, this result reveals that the conditional indirect effect (EL→PCE→WTPM) is stronger when CP is higher. This means the indirect positive effect of eco-literacy on willingness to pay more, through perceived consumer effectiveness, strengthens as the customer participation increases. This result supports H6.

Table 4 Hypothesized relationships (H1–H4).

Predictor	b	SE	t value	LLCI	ULCI
<i>DV – Willingness to Pay More (WTPM)</i>					
Constant	4.545	0.067	67.212***	4.412	4.678
CP	0.148	0.043	3.405**	0.062	0.233
LoEC (H1)	-0.802	0.054	-14.996***	-0.907	-0.697
CP x LoEC (H3)	0.075	0.033	2.273*	0.010	0.141
Constant	4.56	0.079	57.439***	4.404	4.716
CP	0.091	0.050	1.813 (NS)	-0.078	0.190
EL (H2)	0.662	0.073	9.100***	0.519	0.805
CP x EL (H4)	0.045	0.041	1.089 (NS)	-0.036	0.125
<i>DV – Perceived Consumer Effectiveness (PCE)</i>					
Constant	4.988	0.063	78.151***	4.820	5.069
CP	-0.024	0.054	0.647 (NS)	-0.0979	0.0494
LoEC	-0.552	0.037	-10.164***	-0.6593	-0.4454
CP x LoEC	-0.016	0.032	-0.508(NS)	-0.0780	0.0460
Constant	4.936	0.064	77.297***	4.810	5.061
CP	-0.068	0.038	-1.773 (NS)	-0.143	0.007
EL	0.503	0.62	8.108***	0.381	0.624
CP x EL	0.108	0.036	3.012**	0.037	0.178

Note:

NS means not significant

LoEC: Lack of Environmental Concern; EL: Eco-Literacy; CP: Customer Participation

* $p \leq 0.05$.

** $p \leq 0.01$.

*** $p \leq 0.001$.

Table 5 Hypothesized Relationships (H5 and H6) DV – Willingness to Pay More; Mediator – Perceived Consumer Effectiveness; Moderator – Customer Participation.

Hypothesis	IV	Value of Customer Participation	Conditional Indirect Effect	SE	LLCI	ULCI
H5	LoEC	-1SD (2.068)	-0.095 (NS)	0.059	-0.231	0.084
		M (3.775)	-0.093 (NS)	0.053	-0.209	0.096
		+1SD (5.483)	-0.092 (NS)	0.054	-0.213	0.106
H6	EL	-1SD (2.068)	0.165†	0.061	0.068	0.311
		M (3.775)	0.261†	0.056	0.155	0.384
		+1SD (5.483)	0.356†	0.068	0.213	0.497

Note: ** $p \leq 0.01$, *** $p \leq 0.001$.

NS means not significant.

LoEC: Lack of Environmental Concern; EL: Eco-Literacy.

* $p \leq 0.05$.

5. General discussions and implications

First, based on a U.S. consumer sample, our results show that as expected, consumers who lack environmental motivation (low environmental concern) are unlikely to pay more for green products, which is consistent with previous literature. Interestingly, as hypothesized, we found that such an initial unwillingness is mitigated by a high level of customer participation. However, unexpectedly and surprisingly, PCE (efficacy beliefs) is not a pathway through which environmental concern affects WTPM. That is, concerned consumers are more willing to pay more for green products but such willingness is not due to the consumers' feeling that their actions will have a significant impact; they exhibit pro-environmental behaviors due to their concern about the environment, not how much impact they feel they will have on the environmental issues.

Second, expectedly, consumers with high environmental ability (high eco-literacy) tend to pay more for green products, which is in line with the previous literature. Unexpectedly and surprisingly, a higher level of customer participation does not moderate the direct path between eco-literacy and WTPM. This means that unfortunately,

involving consumers with low environmental knowledge in co-creating the product does not directly help increase their WTPM. However, as expected, PCE translates environmental ability (eco-literacy) into WTPM, and CP moderates the indirect path between eco-literacy and WTPM via PCE. That is, although consumers low in eco-literacy will not immediately be willing to pay more for green products, they will experience increased PCE after participating more (vs. less) in co-creating the green product, which in turn increases their willingness to pay more. The finding that PCE mediates the path between eco-literacy and WTPM but not the path between environment concern and WTPM is interesting and unexpected (see further discussion of this finding in theoretical implications).

5.1. Theoretical implications

First, our findings add a fresh perspective to extant research on consumers' WTPM for green products, which is largely limited to uncovering dispositional factors that characterize willing vs. unwilling consumers (e.g., Kang et al., 2012; Laroche et al., 2001). Our research builds on these findings by deepening our understanding of dispositional factors, while making firm-driven interventions a central focus. Comprehending ways to improve consumers' WTPM for green products is an important, but overlooked, aspect of green marketing research. This research is among the first to investigate marketing actions that can mitigate the "hindering" effects of some consumer-inherent characteristics (e.g., low sustainability-oriented motivation and ability).

Second, this study affirms the application of the consumer characteristics model in explaining consumers' WTPM for green products. Green products differ vastly from regular products due to the credence nature. Our findings confirm that both the right motivation and ability are needed on the part of the consumer for them to intend to pay more. Interestingly and unexpectedly, while efficacy beliefs (PCE) translate ability (eco-literacy) into intention to pay more, they are not a pathway through which environmental motivation (environmental concern) influences intention to pay more. While environmental concern involves consumers' evaluation of the issues, eco-literacy involves consumers' self-evaluation (per our operationalization) (Amyx et al., 1994). Like eco-literacy, PCE equally involves consumers' self-evaluation. Thus, it is possible that antecedents involving self-evaluation will influence behavioral intentions through efficacy beliefs (e.g., PCE), but this may not be warranted if the antecedents do not involve self-evaluation. This finding is intriguing for theoretical advancement in consumer literature.

Third, the findings contribute to the CP literature by showing the benefits of engaging consumers in the green consumption context. Although positive, negative, and nonsignificant effects of CP have been documented in the marketing literature (Dong and Sivakumar, 2017), little research exists on effects of CP on green purchase. Given green products are qualitatively different from ordinary products, it is important to supply empirical evidence for the effect of CP as it relates to consumers' WTPM. This research is among the first to investigate CP in the green purchase context and link CP to improving PCE and WTPM for green products.

5.2. Managerial implications

First, the findings are vital for practitioners who lack viable alternatives to change consumers' negative predispositions toward green products. Consumers' existing predispositions are difficult to change. The solution implied in our findings may be a welcome relief for situations short of practical solutions to consumers' unfavorable predispositions toward green products. Based on our findings, sustainability-oriented firms should create more engagement opportunities by designing the production and delivery process in ways that more CP and involvement is allowed. Consumers who are inherently skeptical about

green products or ill-equipped to choose green products may be positively incentivized by a high level of CP.

Second, our findings provide specific insights for how CP initiatives should be implemented. When low eco-literacy is the predominant impediment to purchasing green products, practitioners should focus their CP initiatives on helping consumers build a sense of competence and efficacy beliefs. In contrast, when negative attitude toward preserving the environment is the predominant hindrance to buying green products, practitioners' CP initiatives should directly aim to increase consumers' subjective valuation of their own hard work and effort toward co-creating the product. Different CP initiatives can be used to enhance feelings of competence and efficacy vs. feelings of value. For example, offering decisional control over the process is likely to increase feelings of competence and efficacy as it makes the consumer/self-designer feel like "the cause," whereas offering design freedom is likely to increase value as a high preference fit is achieved (Franke et al., 2010).

5.3. Limitation and future research

First, the use of a single T-shirt design context presents a limitation. Although T-shirt design is a prime example of CP (Franke et al., 2010), future research should investigate if the same benefits of CP can likewise be observed when a different product design context is used. Previous research has suggested that the extent to which consumers' feeling of having made a contribution is desirable is simply unknown (Franke et al., 2010). It is possible that a linear relationship (i.e., the higher the contribution, the higher consumers' subjective valuation) does not exist. There might be a maximum point beyond which higher contributions do not increase consumers' valuation any further. Thus, it may be worthwhile to look into whether consumers who spend considerable resources to design a high-involvement product (e.g., co-design a kitchen) will be more willing to pay premiums for sustainable materials. Furthermore, it would be interesting to replicate the study using a service co-production context. Kang et al. (2012) examined hotel guests' willingness to pay premiums for hotels' green practices and found a positive relationship between environmental concern and WTPM for hotels' green initiatives. Future study may investigate the moderating effect of CP using a service context.

Second, this study primarily focuses on the role of CP in moderating consumers' dispositions toward green products. However, situational factors may also have negative effects on consumers' WTPM for green products. Future studies can explore if CP moderate situational factors (e.g., negative social influence) that inhibit consumers' WTPM for green products. In addition, this study only includes only one behavioral outcome, WTPM. Although this is an important "everyday green behavior," future research can include multiple other pro-environmental behaviors (e.g., plastic bag consumption, recycling, energy conservation) as outcome variables to see if CP will induce positive spillover (i.e., the positive effects of the intervention/CP on other pro-environmental behaviors that were not initially targeted by the intervention) (Truelove et al., 2014). The spillover literature largely focuses on explicit inventions such as a request to perform a new green behavior, tax incentive, and public education campaign (Truelove et al., 2014). Given that CP may be viewed as an implicit intervention, future research on the role of CP in spillover should reveal important theoretical implications for researchers.

Finally, from the methodological standpoint, future research on determining willingness to pay can explore other methods that are not regression-based (choice-based conjoint analysis, contingent valuation method, etc.) to see if the current results can be replicated. Also, the current study utilizes hypothetical scenarios in the experimental manipulation. Although the experimental stimuli (Fig. 3a and b) resemble the real-life situation, future research should seek field data using non-experimental approaches (such as observation) to increase the generalizability of the findings. In addition, the current study focuses on a

a
Manipulation: High Customer Participation Condition

b
Manipulation: Low Customer Participation Condition

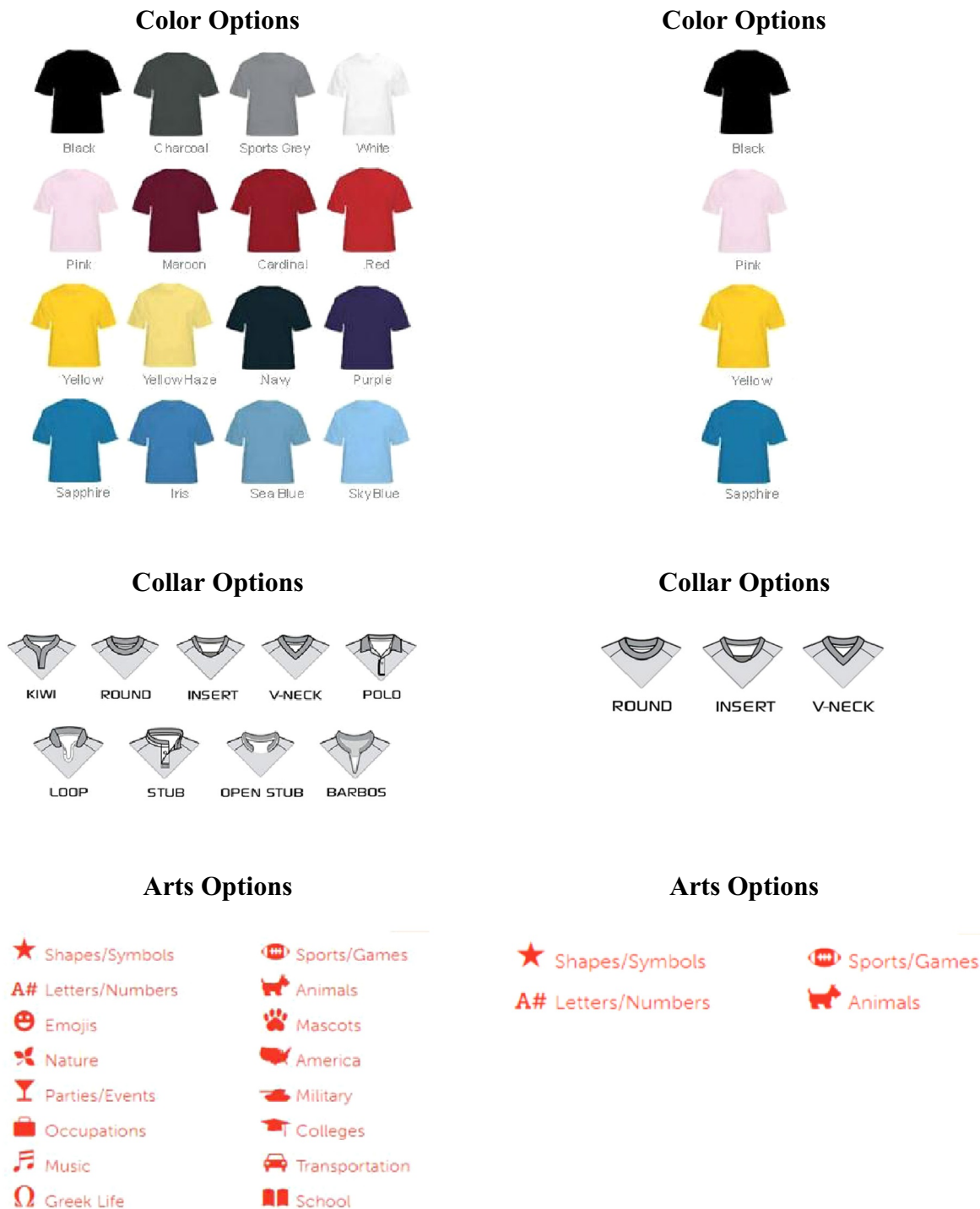


Fig. 3. a Manipulation: High Customer Participation Condition. b Manipulation: Low Customer Participation Condition.

single green product category (clothing items). Future research can explore other green product categories that can be co-created with consumers (e.g., eco-friendly DIY furniture) to see if the same beneficial effect of customer participation can be observed.

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