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**Consumer purchase intentions for green products: Mediating role of WTP and moderating effects of framing**

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## **Consumer purchase intentions for green products: Mediating role of WTP and moderating effects of framing**

### **Abstract**

This research examines the role of consumers' willingness to pay (WTP) in the purchase decision process for a green product and investigates the moderating effects of two types of framing: price and ecological message claim. Using an experimental design, 262 participants were assigned randomly to one of nine conditions (3 price  $\times$  3 ecological message frames). The results reveal a mediating effect of WTP on the relationship between consumers' perceptions and purchase intentions. Furthermore, a price framed in aggregate terms reinforces the positive effect of WTP on purchase intention. The mere presence of an ecological message claim also enhances the relation between WTP and purchase intentions. This research proposes ways marketers can promote their green products. The results encourage the use of ecological messages and frames of prices in an aggregate form to enhance consumers' purchase intentions through WTP.

**Keywords:** willingness to pay; framing, internal reference price; financial perceived risk; ecological perceived benefits; green product

## **Introduction**

Price formulations are fundamental for marketers, so many researchers have focused on the concept of willingness to pay (WTP), which reflects the maximum amount of money a consumer will agree to give up for a certain quantity of a product or service (Acquisti and Spiekermann 2011; Kohli and Mahajan 1991; Koschate-Fischer, Stefan, and Hoyer 2012; Krishna 1991). According to Miller et al. (2011), measuring and determining consumers' WTP is critical for formulating competitive strategies, developing new products, and implementing pricing tactics. Prior WTP literature mainly examines ways to measure WTP (e.g., Miller et al. 2011; Wertenbroch and Skiera 2002), consumer profiles (e.g., demographics, attitudes, values) that lead to distinct WTP levels (e.g., Laroche, Bergeron, and Barbaro-Forleo 2001), and the specific relationships of WTP with consumer knowledge (Bechwati 2011), perceived value (Dodds, Monroe, and Grewal 1991), or product design (Kristensen, Gabrielsen, and Zaichkowsky 2012). Yet this stream of research remains underexplored, in the sense that the ways consumers analyze information and how these processes affect their judgment is fundamental for marketers. Therefore, this article explores the determinants of and influences on WTP to enhance understanding of consumers' purchase decision-making processes.

Consumer preferences depend on various individual perceptions; the ultimate consumption decision results from a trade-off between consumers' perceptions of the benefits and costs (Luce, Bettman, and Payne 2001). Their WTP thus appears to result from a trade-off between certain benefits and costs; in turn, it influences purchase intentions. This effective conceptualization of WTP can help marketers overcome consumer-established barriers related to price. For example, for a green, or environmentally friendly, product, consumers' trade-off is specific to the risks and benefits they perceive in relation to its ecological features. Because such products tend to be more expensive than conventional offerings (Consumer Reports

2007), WTP likely has a central role in the purchase decision process. Furthermore, in response to consumers' increasing ecological consciousness (Gallup Poll 2009; Hartmann and Apaolaza-Ibáñez 2012; Husted et al. 2013; Laroche, Bergeron, and Barbaro-Forleo 2001; Royne, Levy, and Martinez 2011; Thøgersen and Zhou 2012), more firms offer environmentally friendly products, which requires them to find a way to make their green offers sufficiently attractive, despite any additional costs. Green products are intriguing in this context, in that despite consumers' stated agreement that they would pay more for such products, relatively few people buy them in reality (Luchs et al. 2010).

To reconcile these phenomena, we propose examining the extent to which unique presentations of the same information might exert various effects on consumers' perceptions (Tversky and Kahneman 1981). For example, different frames applied to the same price and message claims might shape consumers' WTP (Gamliel and Herstein 2007). Consumers are sensitive to the contextual information contained in price offers, so price frames likely influence both the perceived costs of the transaction and consumers' final purchase decisions. Gourville (2003) calls for more research into the behavioural mechanisms that underlie this influence. In addition, environmentally oriented advertising might improve product evaluations, but marketers still know little about how to convey green claims effectively (Grimmer and Woolley 2012; Hartmann and Apaolaza-Ibáñez 2009; Kong and Zhang 2012). Such advertising even could be counterproductive if the claim appears misleading. Therefore, we investigate both price and ecological message framing strategies applied to green products to determine their effects on consumers' WTP and purchase intentions, as well as detail their usefulness for marketers. Our findings indicate a mediating effect of WTP on the relationship between consumers' perceptions of financial risk or ecological benefits and their purchase intentions. Price framed in aggregate terms and the mere presence of an ecological message claim can reinforce the positive effect of WTP on purchase intentions for a green product.

The rest of this article is organized as follows: In the next section, we review prior literature related to consumers' WTP and develop our hypotheses. After introducing the research methodology, we present the empirical analyses and results. The last section offers theoretical and managerial contributions, limitations, and further research directions.

## **Literature review and hypotheses**

### ***Consumer WTP***

As we already defined it, WTP is the maximum amount of money that a consumer is willing to pay for a certain quantity of a product or service (Acquisti and Spiekermann 2011; Kohli and Mahajan 1991). Knowledge of WTP helps companies understand consumers' price perceptions and meet their expectations, which depend on the proportion and importance of available attributes (e.g., degradability or recyclability of green products). For green products, consumers face a dilemma though, because they generally perceive the price as higher than that charged for conventional products. Husted et al. (2013) argue that environmentally oriented firms suffer from high cost structures, which directly affect their final offer prices. Pickett-Baker and Ozaki (2008) also note that in some cases, the initial price of newly introduced, low energy consumption products is quite high. The Green Gauge Global research project specifies that 6 in 10 consumers believe environmentally friendly product alternatives are too expensive (GFK 2012). As they trade off the benefits and risks of green products in the process of setting their WTP, consumers likely assess both positive and negative aspects. We investigate three factors as potential determinants: ecological perceived benefits (EPB), financial perceived risk (FPR), and internal reference prices (IRP).

### ***Determinants***

Consumers use reference prices as comparison standards to assess the value of a product or service. Their evaluations are not in absolute terms but rather are relative to a reference point (Garbarino and Slonim 2003), which might be internal (memorized) or external (displayed in the marketplace) (Dickinson and Dickinson 2012; Monroe 1973; Putler 1992). As Dholakia and Simonson (2005, 206) explain, ‘consumers’ perceptions of attribute values and product preferences are determined largely by the reference points they use, rather than by absolute values alone.... price perceptions are strongly influenced by reference prices, such as the prices of products encountered previously or externally available store prices.’ Thus, though external sources such as price advertisements might influence a consumer’s IRP, it is fundamentally the result of a memory process that relies on prior experiences with similar products or brands. For our study context, we conceptualize IRP as the expected price that consumers perceive as fair for an equivalent good that has no green attributes (Dickinson and Dickinson 2012; Garbarino and Slonim 2003). If consumers establish a higher IRP, they are willing to pay a higher price. Despite this close relation between IRP and WTP (Chandrashekar 2001), Bearden et al. (1992) demonstrate empirically that the concepts are distinct.

In addition to product costs, reference points, and IRP in particular (Chandrashekar, 2001), can shape consumers perceptions of financial risk (FPR), which reflect the possible monetary costs of a transaction. A high IRP, indicating perceptions of high quality and added value for a product (Grewal et al. 1998), should expand the margin at which a price appears acceptable and reduce FPR. Accordingly,

**H1:** A higher IRP leads consumers to indicate a (a) higher WTP and (b) lower FPR.

Yet perceived risk generally has a negative impact on consumer perceptions and purchase intentions (Alhakami and Slovic 1994; Dowling 1986; Nordgren, van der Pligt, and van Harreveld 2007). If consumers anticipate poor outcomes, their expected value for the

product declines, as does their WTP. Thus, higher FPR should lead to lower WTP. For green products, these perceptions may concentrate on ecological benefits. Accordingly, we define EPB in relation to consumers' beliefs about the efficacy of a claim that the offering will have a minimal negative impact on the environment. Consumers likely need to search for information to discern the ecological advantages of a new green product. According to Hirunyawipada and Paswan (2006) though, they are less likely to engage in a search for information about new products if the potential losses of its adoption are highly salient. Thus, 'a high perceived financial risk might dissuade consumers from acquiring any further information about new products' (Hirunyawipada and Paswan 2006, 188). If FRP discourage consumers from pursuing the potential ecological benefits of a new product, logically, consumers' assessment of their FRP must occur prior to their consideration of EPB. That is, consumers need information about green attributes to establish a trade-off, but if FPR discourages them from acquiring information (Hirunyawipada and Paswan 2006), they are unlikely to spend more for green products, about which they still know little. Using this reasoning, such that FPR represents an antecedent of EPB, we propose:

**H2:** Higher FPR leads consumers to indicate lower (a) WTP and (b) EPB.

Modern consumers, with their increasing interest in environmental issues, appear far more aware of the ecological benefits of certain products than prior generations. This growing awareness has granted consumers a means to recognize key green product attributes. Perceptions of ecological features should enhance the perceived value of green products (Grewal et al. 1998; Zeithaml 1988) and increase consumers' WTP to acquire such products. Therefore,

**H3:** Higher EPB leads consumers to express higher WTP.

*Mediating role of consumer WTP*



Purchase intentions result from a trade-off of the advantages and disadvantages of a product or service, as perceived by consumers (Dodds and Monroe 1985; Luce, Bettman, and Payne 2001). A positive purchase intention thus depends on IRP, FPR, and EPB. Considering the particularities of green products (i.e., additional costs, ecological features), WTP should have a more pronounced role in related purchase decision processes, because it represents the last assessment step, before the formation of purchase intention. That is, we have postulated that a consumer's WTP mainly depends on her or his IRP, FPR and EPB; here, we argue that these antecedents affect purchase intentions through WTP:

**H4:** The effects of (a) IRP, (b) FPR, and (c) EPB on consumers' purchase intentions are mediated by WTP.

#### ***Moderating effects of framing strategies***

The notion of framing derives from prospect theory (Kahneman and Tversky 1979) and refers to 'the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice' (Tversky and Kahneman 1981, 453). A simple change in the presentation of the same decision problem can lead to different individual preferences. Kühberger (1998, 24) explains that 'in decision theory, the term *frame* can be used in a "strict" and in a "loose" sense. The strict definition relates to the wording of formally identical problems, i.e., to a semantic manipulation of prospects whereby the exact same situation is simply redescribed.' For this study, we opt for strict framing,<sup>1</sup> to be able to explain differences in perceptions more fully. Vast literature on judgment and decision making explicates the ways in which semantic manipulation influence the framing of organizational issues; prior research generally asks participants to 'choose between two alternatives (i.e., a sure thing and a risky option) that are semantically manipulated to alter decision-makers' valuation of the (objectively) same

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<sup>1</sup> Kühberger (1998) argues that a loose framing goes beyond semantic manipulation and may result from other contextual features of the decision situation.

outcomes' (Stapel and Koomen 1998, 133). Another classical manner to frame identical problems is to use different price formulations. We consider these two distinct types of framing: price and semantic manipulation of the ecological message.

#### *Moderating effects of price framing*

Price frames can affect consumers' monetary assessments (e.g., Gendall et al. 2006), WTP, and purchase intentions. When prices appear in an aggregated format, the whole price is exhibited, whereas if they appear in a disaggregated format, the same objective price appears in segments, depending on a time schedule of payments (price displayed at a certain number of months or days). Disaggregated prices should be more effective in economic and psychological terms. As economic research has shown, the time value of money leads to varying consumer behaviours in response to prices (Frederick, Loewenstein, and O'Donoghue 2002; Kovacs and Larson 2008). Disaggregated prices also help reduce the perceived costs of a transaction (Gourville 2003). Therefore, a disaggregated or per day pricing strategy should help consumers encode price information and perhaps reduce purchase anxiety. Finally, consumers are more willing to accept prices framed as 'pennies-a-day' rather than in aggregate terms (Sinha and Smith 2000), likely because they have difficulty computing prices (Thomas and Morwitz 2005), so consumers process that information only partially. Accordingly, we hypothesize:

**H5:** Price framing moderates the influence of consumers' WTP on purchase intentions.

#### *Moderating effects of ecological message framing*

Green products often feature specific communications to inform consumers about their environmental contributions. Such advertising claims should influence consumers'

perceptions and help convince them to buy the green product, as well as moderate the effects of WTP on purchase intentions. First, consumers like to be informed and prefer to make product decisions that are consistent with their desires, such as a goal of reducing environmental damage (Davis 1993). If they recognize the benefits of a green product for preserving the environment, consumers might agree to its purchase more easily, especially in the presence of a concrete claim rather than in its absence. Second, the message focus (positive or negative) constitutes a specific type of ad framing. Previous studies note the effects of message framing on consumer responses to advertisements (e.g., Grewal, Marmonstein, and Gotlieb 1994; Martin and Marshall 1999) and prices (Gamliel 2010) in various consumption domains. On average, a positive frame highlights the potential favourable outcomes and is more effective than a negative frame that emphasizes possible adverse consequences (Arora 2008), because it generates more favourable associations and encoding (Biswas and Grau 2008). However, Martin and Marshall (1999) note that negative frames are more persuasive and accepted in certain conditions. For this study, we create negative and positive frames with a semantic manipulation of the ecological claim that varies the terminology used to present the ecological message. The positive frame stresses the ecological contributions of the green product; the negative frame highlights the prevention of negative outcomes, though the added value for the environment is objectively identical. We predict:

**H6:** The framing of the ecological message claim moderates the influence of consumers' WTP on their purchase intentions.

Figure 1 contains the conceptual model, in which we summarize the predicted relationships among the variables.

[Insert Figure 1 about here]

## **Methodology**

### ***Research design***

The quasi-experimental design featured advertisements for a green laptop with 3 (temporal price framing: euros-a-day price, euros-a-month price, and aggregate price) × 3 (ecological message framing: no message, positive ecological message, and negative ecological message), full-factorial, between-subjects factors. The prices were manipulated only with respect to the framing criterion, so the offer maintained the same final price (1049€) across all conditions. Three modalities in our design reflected this consistent economic value: (1) aggregated price: 1049€, (2) disaggregated price per month: 49.95€ a month (over 21 months), and (3) disaggregated price per day: 1€ a day (over 2 years, 10 months and 14 days).

In all the experimental conditions, the offer was a green-oriented one (product name and characteristics). The framing featured an ecological message in the stimuli, and the message manipulation reflected the percentage of recycled materials in the product. Thus the positive framing indicated that a high percentage of materials were recycled ('80% of materials will be recycled with EcoLaptop'); the negative framing noted that 'only 20% of materials will not be recycled.'

### ***Stimuli***

The product had to be expensive enough to induce FPR but not prohibitively expensive for the respondents. The selected green laptop used a fictitious product name (EcoLaptop) and represented a relatively new offer for consumers. The brand name was not revealed, to avoid evoking any established attitudes. All stimuli ads appeared with a white background, the same product name, and the same picture of the laptop, to ensure attention to the focal manipulations (price and ecological message frames) (see Appendix 1).

Respondents' perceptions of the stimulus were controlled on the basis of a previous pretest, conducted with 28 participants whose profiles were similar to those of the respondents in the main study.

### *Participants*

To ensure that we could compare the effects of the nine experimental conditions accurately, we needed a homogeneous population. The sample consisted of 262 graduate and undergraduate students from a French university who received an e-mail invitation to access a dedicated website.<sup>2</sup> We chose a student sample primarily to exploit its homogeneity (Peterson 2001) and thereby increase internal validity, which Winer (1999, 349) calls 'a necessary condition for any experimental study. External validity is not of much concern in experimental work if the researcher cannot adequately show that the results found from an experiment are truly due to the manipulation(s).' In our sample, 51% of the participants were women, and the mean age was 22.11 years. Each participant was randomly assigned to one of nine conditions (3 price × 3 ecological message frames) (28–31 subjects per condition).

### *Procedure*

The online procedure prevented participants from turning back to pages they already had read or moving on to pages if they had not answer questions. They began by viewing an advertisement for the green laptop with the fictitious name. Depending on the experimental condition to which they had been assigned, this advertisement included different green message claims. The price was hidden. Participants declared their IRP and WTP for the EcoLaptop. Next, they viewed the same advertisement, except that it contained the

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<sup>2</sup> According to the Centre for Retail Research, the French market for green products in 2009 grew to €10.6 billion, or 2.4% of total sales. In addition, French consumers pay 51% more for green products (except food) on average, though their costs have increased only 29%. Sales of green products are predicted to double during the next five years (<http://www.retailresearch.org>).

manipulated price of the EcoLaptop. Finally, they declared their intention to purchase this product and provided their perceptions of financial risk and ecological benefits.

### ***Variable measures***

Using translation and back-translation procedures, we developed French versions of existing English-language scales. For the IRP measure, we used three items from Vaidyanathan (2000). The measure of FPR relied on Stone and Gronhaug's (1993) three-item, seven-point Likert subscale. We developed a new measure of EPB for this study; it consisted of a three-item, seven-point Likert scale. We measured participants' WTP using a direct valuation method (Miller et al. 2011), with an open-ended question. Specifically, respondents indicated the price that they would be willing to pay for a EcoLaptop. Finally, purchase intentions were assessed with a dichotomous scale, to collect respondents' choices to purchase or not purchase the EcoLaptop (see Appendix 2).

### ***Factor analysis and scale reliability***

A factor analysis with Varimax rotation of the IRP, FPR and EPB items generated three factors with eigenvalues greater than 1. All items loaded above .7 on their intended factors, and no item loaded higher than .28 on a different factor (Hair et al. 2004). The extracted factors fit the three expected variables. The Cronbach's alphas for IRP, FPR and EPB were .82, .81 and .78, respectively.

## **Results**

### ***Preliminary analyses***

To assess the ecological message framing manipulation, we examined its influence on EPB. Participants reported different ratings according to the three conditions—no message,

negative ecological message, or positive ecological message. In an analysis of variance, these manipulations received support ( $F = 11.78, p < .001$ ;  $M_{\text{absence}} = -.36, SD = .94$ ;  $M_{\text{negative}} = -.01, SD = .95$ ;  $M_{\text{positive}} = .37, SD = .98$ ). In the Tamhane T2 post-hoc comparison test, the mean differences were significant for the no message condition and both messages ( $p < .05$  for negative,  $p < .001$  for positive). As expected, the respondents perceived ecological benefits as higher in the positive condition than in the negative one ( $p < .05$ ).

A comparison of the undergraduate and postgraduate student respondents included in the sample also ruled out the existence of an answer bias, because the mean value of WTP did not differ across these two groups ( $t = .33, p = .74$ ;  $M_{\text{undergrad}} = .03, SD = .99$ ;  $M_{\text{postgrad}} = -.01, SD = 1.00$ ). The two groups also were similar in the other responses we measured: IRP ( $t = -1.26, p = .21$ ;  $M_{\text{undergrad}} = -.11, SD = .92$ ;  $M_{\text{postgrad}} = .05, SD = 1.03$ ), FPR ( $t = .14, p = .89$ ;  $M_{\text{undergrad}} = .01, SD = .95$ ;  $M_{\text{postgrad}} = -.01, SD = 1.02$ ), EPB ( $t = 1.42, p = .16$ ;  $M_{\text{undergrad}} = .12, SD = .96$ ;  $M_{\text{postgrad}} = -.06, SD = 1.02$ ), and purchase intention (Pearson's  $\chi^2 = .17, p = .68$ ).

### ***Direct influences***

We relied on linear regressions to test H1–H3. Not only did IRP have a negative influence on FPR ( $\beta = -.18, t = -2.91, p < .01$ ) but FPR also exerted a negative effect on EPB ( $\beta = -.26, t = -4.39, p < .001$ ), in support of H1b and H2b. In another linear regression, with IRP, FPR, EPB, and their interactions as the independent variables and WTP as the dependent variable (Table 1), both IRP and EPB significantly influenced WTP ( $\beta = .67, t = 14.81, p < .001$ ;  $\beta = .12, t = 2.59, p < .05$ , respectively). Specifically, higher levels of IRP and EPB led to higher WTP, in support of H1a and H3. Furthermore, WTP was significantly predicted by FPR ( $\beta = -.13, t = -2.87, p < .01$ ), such that higher levels of FPR decreased WTP, in support of H2a. As we expected, when IRP was the independent variable, it had the greatest influence on WTP. The interaction terms of IRP and FPR and of IRP and EPB were not significant, whereas the

interaction between FPR and EPB was a significant predictor of WTP ( $\beta = -.09, t = -2.26, p < .05$ ). Higher ecological benefits intuitively are associated with greater financial perceived risk, because consumers are unsure of the quality of the newly introduced green product. In this case, the interaction term reduces WTP.

[Insert Table 1 about here]

### ***WTP as a mediator***

To assess the mediating role of a consumer's WTP, we used the PROCESS macro developed for SPSS (Hayes 2013). One constraint of this macro is that it can specify only a single independent variable. Therefore, we executed it separately for each independent variable in our model (IRP, FPR and EPB), leaving the others as covariates.

[Insert Table 2 about here]

First, for the mediation of WTP between IRP and purchase intention, we determined a significant influence of IRP on WTP ( $a = .632$ ), as we detail in Table 1. With a binary logistic regression model, we also examined the direct effect of WTP on purchase intentions ( $b = .908$ ). As expected, WTP significantly predicted purchase intentions, such that greater WTP increased purchase intentions. In addition, IRP indirectly influenced purchase intentions through its effect on WTP. The bias-corrected bootstrap confidence interval for the indirect effect ( $ab = .574$ ), based on 1,000 bootstrap samples, excluded zero (.161–1.066). Finally, the direct effect of IRP on purchase intention was not significant ( $c' = .211, p = .350$ ), so we had no evidence that IRP influenced purchase intentions independent of its effect on WTP, suggesting an indirect-only mediation (Zhao, Lynch, and Chen 2010).

Second, in the mediation analysis we conducted to test if FPR indirectly influenced consumers' purchase intention through its effect on WTP, we found a significant influence of FPR on WTP ( $a = -.138$ ). The direct effect of WTP on purchase intentions, as we noted



previously, revealed a significant influence. Furthermore, IRP indirectly influenced purchase intentions ( $ab = -.125$ , bootstrap confidence interval:  $-.316$  to  $-.030$ ), and its direct effect was also significant ( $c' = -1.065$ ,  $p = .000$ ). Thus we found a less central role of WTP in this case (complementary mediation).

Third, regarding the mediating role of WTP between EPB and purchase intentions, we determined that EPB significantly influenced WTP ( $a = .110$ ). The confidence interval of the indirect effect ( $ab = .100$ ) was entirely above zero ( $.007$ – $.297$ ). The direct influence of EPB on purchase intention was not significant ( $c' = -.084$ ,  $p = .654$ ). Thus we found indirect-only mediation. Overall, these results offered consistent support for all the elements of H4.

#### ***Price framing as a moderator***

In H5, we predicted that the relationship between WTP and purchase intention changes with price framing. Therefore, we created three groups, reflecting the three experimental manipulations: euros-a-day, euros-a-month, and aggregate price. With hierarchical logistic regression analyses, we tested for the null hypothesis that the relationship between WTP and purchase intention would not vary across price frame groups. The findings in Table 3 (Models 1 and 2,  $N = 262$ ) reveal that the chi-square statistic changed significantly ( $\Delta\chi^2 = 17.381$ ,  $p < .001$ ) when we included the two product terms that reflected the interaction between WTP and the price frame dummy variables (euros-a-day and euros-a-month) in Model 1. That is, we affirmed a moderating effect of price framing. In Model 2, each additional unit of WTP increased purchase intentions in the aggregate price condition ( $\beta = 4.471$ ). The interaction terms had negative influences on purchase intentions though ( $\beta = -3.761$  and  $-3.392$ ). Thus, the relationship between WTP and purchase intentions did not grow stronger when the price was disaggregated.

In supplementary analyses, we also compared responses for the per day and per month conditions (Table 3, Models 3 and 4, N = 173), as well as those obtained in the per month and aggregated price conditions (Table 3, Models 5 and 6, N = 177). The WTP–purchase intention relationship was not significantly different in the first comparison ( $\Delta\chi^2 = .742, p = .389$ ), but it differed in the second ( $\Delta\chi^2 = 12.454, p = .000, \beta = -3.392$ ).

[Insert Table 3 about here]

### ***Ecological message framing as a moderator***

We predicted that ecological message framing would moderate the relationship between WTP and purchase intention. To test H6, we created three groups, corresponding to the experimental conditions (no message, positive message, negative message), and applied hierarchical logistic regression analyses. The findings in Table 4 (Models 1 and 2, N = 260) reject the null hypothesis that the variation in  $\chi^2$  is attributable to hazard ( $\Delta\chi^2 = 9.623, p = .008$ ), in support of a moderating effect of ecological message framing.

In complementary analyses, we also tested whether the WTP–purchase intention relationship would be enhanced in the presence, rather than the absence, of ecological message claims. The results of the comparisons of no message with both positive (Table 4, Models 3 and 4, N = 172) and negative (Table 4, Models 5 and 6, N = 176) messages were consistent with this view ( $\Delta\chi^2 = 5.963, p = .015$ ;  $\Delta\chi^2 = 7.058, p = .008$ , respectively). Comparisons of the positive with the negative message condition (Table 4, Models 7 and 8, N = 172) also revealed that the WTP–purchase intention link was not stronger in the positive message frame ( $\Delta\chi^2 = .040, p = .841$ ).

[Insert Table 4 about here]

## **General discussion**

This study has examined the determinants and consequences of consumer WTP for a green product, a relatively underresearched area. By considering the effects of both price and ecological message frames, we extend knowledge of framing effects on consumers' perceptions, within the WTP process, and thus produce several theoretical and practical insights.

First, most WTP studies explore measurement methods or examine variability across different types of products (Hamzaoui-Essoussi and Linton 2010). We go further by exploring a mediating role of WTP within the consumer decision-making process for a green product. We specify that WTP depends on IRP and the trade-off between FPR and EPB. As expected, all three elements are significant predictors of WTP; in particular, the variables associated with price (IRP and FPR) have substantial effects. The findings thus affirm prior studies that focus on the price–product evaluation relationship to explain perceived value (Beneke et al. 2013) or WTP (Dodds, Monroe, and Grewal 1991). They also reinforce the positioning of IRP as a close antecedent of WTP (Chandrashekar 2001). Furthermore, because EPB exerts the lowest influence on WTP, it appears that green product attributes, even if perceived as important, cannot compensate for high perceived costs (Carrigan and Attalla 2001).

Second, we confirm the crucial role of WTP for marketing (Acquisti and Spiekermann 2011): It imposes a full mediating effect on the consumer purchase decision process (i.e., among IRP, EPB, and purchase intentions), which suggests that consumers rely on price, in the form of WTP, to make purchase decisions about a new green product. This evidence can help marketers determine demand for a new offer, such as a green laptop, and derive ways to shape buying decisions. Our finding also confirms the explanatory power of WTP as an indicator of demand, which reflects the trade-off consumers make. That is, identifying WTP offers an effective approach to determine the price a company should charge for its products (Acquisti and Spiekermann 2011) and to maximize the fit between firm profitability goals and

consumer preferences and expectations. The managerial impact of WTP should be substantial, because ‘it is one of the strongest indicators of brand loyalty and may be the most reasonable summary measure of overall brand equity’ (Li, Li, and Kambele 2012, 1517).

Third, marketers stand to gain from matching consumers’ WTP with the right price, as well as framing the offer appropriately. Price framing significantly moderates the relationship between WTP and purchase intention. Perhaps less intuitively, the intensity of this effect decreases when the price is disaggregated. This finding confirms suggestions that a per day price framing might be ineffective in some conditions (e.g., Gourville 1999, 2003). We proffer two possible explanations. On the one hand, consumers likely use aggregate prices to derive their WTP for a product such as the EcoLaptop. If they are exposed to an offer in euros-a-day or euros-a-month form, they must perform mental calculations to match their WTP with the advertised price. This situation implies a strong disturbance in their judgment and purchase decision processes; they likely need time to analyze the prices and recover reference points, especially for a new green product. On the other hand, consumers could have been disturbed by a per day payment indication, particularly for a laptop—a product for which the price usually appears in aggregate form. This outcome is relevant, irrespective of whether the focal product is a green or a traditional version.

Fourth, we find a moderating effect of ecological messages on the WTP–purchase intention relationship: This effect is always stronger in the presence of an ecological message claim rather than in its absence. Thus, message claims appear highly relevant in advertising for green products (Davis 1993; Hartmann and Apaolaza-Ibáñez 2009; Kang et al. 2012). Yet the influence of WTP on purchase intention is not higher in the positive, compared with the negative, ecological message condition; rather, it appears slightly stronger in the negative condition, though this difference is not statistically significant. This finding challenges previous research (e.g., Biswas and Grau 2008) that implies positive attribute framing

consistently leads to more favourable evaluations. Other studies instead find no difference across framing conditions or indicate some benefits of negative framing (Donovan and Jalleh 1999). According to Maheswaran and Meyers-Levy (1990), in high-involvement conditions, respondents process messages in more detail and assign disproportionate weight to negatively framed information, such that the negative frame becomes more persuasive. This explanation is convincing for our study, which refers to a product category that is well known by young consumers. Alternatively, the respondents could have judged the ecological message claim as exaggerated and excessive in the positive condition, such that it seemed less trustworthy than the negative message. Consumers remain distrustful of many environmental claims (Auger et al. 2003; Grimmer and Bingham 2013). Becker-Olsen, Cudmore, and Hill (2006) and Kang et al. (2012) highlight the possibility that customers' WTP for green initiatives could turn negative if they perceive a profit motive or company interest other than an ecological one. More developments should improve understanding of this result; at this point, managers must consider the use of green claims carefully (Schlegelmilch and Pollach 2005).

### **Limitations and directions for further research**

The results of this study should be considered exploratory, in a stream of research (WTP for green products) in which empirical work is sporadic and insufficient. It also suffers from some limitations; additional empirical investigations are required to confirm the WTP formation process and purchase intentions toward green products. For example, the conceptual framework introduces only one type of perceived risk (financial), though perceived product performance also could be a major barrier to green products' selection. New theoretical developments related to framing strategies could improve our understanding of the reasons consumers process prices thoroughly—or choose not to process them.

From a methodological perspective, the use of a student sample has been criticized (Lynch 1999), though Winer (1999) argues that external validity is less of much concern when researchers can show that experimental results are truly due to the manipulations. The choice of a homogeneous sample improves the internal validity of the results and strengthens the theory test (Bergmann and Grahn 1997; Calder, Phillips, and Tybout 1981), which is why student samples continue to be used widely to test marketing theories (Hirunyawipada and Paswan 2006). A student sample also is appropriate in specific situations, such as when students represent an important market segment—as is true for laptops. We predict that the respondents in our study would be very interested in an offer for an EcoLaptop. Students generally are interested in both technology and the environment, so our main results likely apply to other consumers with similar profiles. In contrast, consumers less involved in technology may attribute less weight to FPR in their trade-off, which may increase their WTP. Among consumers less concerned about the environment, the EPB might take less weight in the trade-off, though our data already indicate a smaller influence of EPB on WTP. In this case, our conclusion seemingly would remain valid across samples.

We also relied on unobservable cognitive measures, which are classic tools. The measure of WTP still may be subject to hypothetical and other biases (Morrison and Brown 2009), which could be attenuated with Vickrey auctions or a demand-revealing method.

Finally, self-generated validity theory stipulates that question order could influence respondents' judgments. Podsakoff et al. (2003) suggest counterbalancing the question order; for this study, we only placed the measures of the dependent variables before those of the independent variables. Although this ordering represents a limitation, it also offers the best alternative, in that any other approach would have induced a primary disadvantage: 'it may disrupt the logical flow and make it impossible to use the funneling procedure (progressing

logically from general to specific questions) often recommended in the survey research literature' (Podsakoff et al. 2003, 888).

**Appendix 1. Example ad stimulus: euros-a-day price, positive ecological message**

**EcoLaptop**



**80% of materials will be recycled  
with EcoLaptop**

**For only 1€ a day\***

- Processor: 2.26 Ghz
- System Memory: 4 GB
- Hard Drive: 500GB
- Optical drive CD/DVD
- Display: 13.3"
- Arsenic-free display glass
- Mercury-free
- Highly recyclable enclosure
- Energy efficient

**\* During 2 years, 10 months and 14 days**



## Appendix 2. Scale items for construct measures

Scale	Items
Internal Reference	According to you, what is ...
Price*	IRP1 the normal price of the EcoLaptop (when it is not promoted). IRP2 the most likely price you would find the EcoLaptop. IRP3 the fair price for EcoLaptop.
Financial Perceived Risk**	FPR1. My purchasing of the EcoLaptop for use at home would be a bad way to spend my money. FPR2. If I bought the EcoLaptop for myself for use at home, I would be concerned that the financial investment I would make would not be wise. FPR3. If I bought the EcoLaptop for myself for use at home, I would be concerned that I really would not get my money's worth from this product.
Ecological Perceived Benefits**	EPB1. The advantage of the EcoLaptop is that it is ecological. EPB2. The EcoLaptop is interesting because it allows for energy savings. EPB3. Thanks to the EcoLaptop, I can protect the environment.
Willingness to pay*	WTP. What price you would be willing to pay for the EcoLaptop?
Purchase Intention***	PI. I will buy the EcoLaptop.

\* Open-ended item.

\*\* Items assessed on seven-point Likert-type subscales, with 1 = 'strongly agree' and 7 = 'strongly disagree.'

\*\*\* Dichotomous item.

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