

Desirability bias and perceived effectiveness influence on willingness-to-pay for pro-environmental wine products

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Abstract

Purpose – Consumer marketing suggests that greater concern for the environment is impacting purchase behavior. Recent surveys into US pro-environmental (PE) purchase patterns show a considerable gap between consumers' attitude and actual behavior regarding PE products. What these products have in common is a normative component. This research aims to understand whether perceived consumer effectiveness (PCE) and social desirability bias (SDB) influence consumers' purchase decisions regarding PE wine products and willingness to pay (WTP).

Design/methodology/approach – To assess whether PCE and SDB influence consumer's actual WTP for PE and conventional wine despite normative beliefs (NBs), two studies with sample sizes of 117 and 124 were conducted in the USA. The first part of each study involved surveying participants as to their NB, SDB, PCE and demographics. The second part of the study measured their actual WTP through participation in an experimental auction.

Findings – Consumers with high levels of NBs were significantly more likely to pay higher premiums for PE wines compared to non-PE wines and had higher levels of PCE, suggesting that they believe their purchase behavior makes a difference to the environment. However, this same group is strongly influenced by SDB, indicating that they may "over-report" desirable behaviors. Controlling for PCE and SDB, the significant difference in price for PE wine and non-PE wine was mitigated. Those with lower NBs were just the opposite, less concerned whether their purchase behavior directly impacts the environment, feeling that non-PE wine may be a better value proposition.

Research limitations/implications – The use of an auction method to assess actual behavior may be skewed by the attempt to get a winning bid, and this research was conducted in one particular part of the USA, which limits the generalizability of the results to other parts of the country or world.

Originality/value – The findings from the current research provide important information for wine producers, distributors and retailers, specifically the development of marketing and branding strategies, and as a method for normative product/brand differentiation in a competitive marketplace.

Keywords Market segmentation, Pricing, Customer satisfaction, Survey research, Experiment

Paper type Research paper



1. Introduction

During the past 20 years, there has been a dramatic increase in environmental consciousness worldwide, with consumers changing their behavior to incorporate environmental considerations into lifestyle choices, such as purchasing products that satisfy their needs and affect the natural environment (Barber *et al.*, 2009), and, in many cases, consumers are willing to pay a premium for environmentally friendly products. This swell of interest is affected by the awareness that the supply of natural resources may be limited and that the environmental balance can possibly be changed (Barber *et al.*, 2009).

When considering the wine industry in the USA, increasing pressure to improve its environmental performance is generating a transformation regarding implementation of environmentally safer practices (Marshall *et al.*, 2005). This transformation results from the pressures that wineries have encountered, such as fines for violating the Clean Water Act, being stopped from expanding vineyard space because of endangered species and issues with neighbors over the use of pesticides (Marshall *et al.*, 2010).

Research studies on pro-environmentally conscious consumers evolved in areas such as sociology, education and psychology (Barber *et al.*, 2009; Kil *et al.*, 2014). The results of these research studies found that demographic profiling by income, education, age and concern for the environment had been mixed. Other constructs such as involvement and personality measures of attitude were shown to be promising predictors of ecological concern (Barber *et al.*, 2009; Diamantopoulos *et al.*, 2003).

The debate has moved to more in-depth market studies of pro-environmental (PE) products, so producers can effectively and successfully plan and assess their advertising, pricing and promotional undertakings (Bennett and Williams, 2011; Barber *et al.*, 2014). One concern is determining how to achieve a suitable marketing strategy linking PE products that consumers demand with producers who promote their products toward customers (Barber *et al.*, 2012).

Recent research reported that a significant portion of consumers' purchase decisions is based on a product's environmental attributes (Johnson, 2011; Bazoche *et al.*, 2008; GFK Roper Consulting, 2007; Newton *et al.*, 2015), resulting in the need to understand who these PE consumers are. However, increased public concern over environmental issues does not always result in actual, consistent purchase behavior. Despite a positive attitude toward environmental issues, many PE products have not achieved market success (Johnson, 2011), with evidence suggesting that consumers are price- and quality-sensitive when it comes to "buying pro-environmental" products (D'Souza *et al.*, 2007).

GFK Roper Consulting (2007) found that 40 per cent of Americans are willing to pay for PE products because the perception of such purchase benefits the environment, 55 per cent state PE products are not better for the environment and 74 per cent stated they are too expensive or offered inferior quality. Loureiro *et al.* (2003) found that consumers of Colorado wines were unwilling to pay more for environmentally friendly wine when quality was a perceived difference. On the other hand, Barber *et al.* (2010) found that wine consumers stated they would pay 15 per cent more than they normally pay for a conventional wine, suggesting there is a perception of quality and value associated with environmentally made wine. Recent surveys into PE purchase patterns in the USA shows that there is a considerable gap between consumers' attitude and their actual behavior (TNS, 2008; Bennett and Williams, 2011). This market evidence indicates that

a considerable number of consumers claiming to be environmentally conscious still do not purchase PE products as frequently as their stated intentions and a majority of consumers do not purchase a PE product on a regular basis.

What these consumer products have in common is their normative component – a purchasing bias where the perception individuals may have that they or others “should” buy normative products to conform to societal norms. By purchasing these products, they may believe they can make a difference with improving the environment through their behavior. There are two key constructs that are measured around this concern. One is referred to as perceived consumer effectiveness (PCE) and is an emerging concept throughout consumer and business research (Gilinsky *et al.*, 2015). The other considers how individuals may be predisposed to purchasing bias because of social desirability bias (SDB) and measures the degree to which people respond in socially acceptable terms to gain the approval. Yet, according to Johnson (2011), Americans state financial incentives and disincentives [penalties] are a greater influence on their PE behavior than pressure from family, friends and government. The questions still remain: Who are PE consumers? Do they feel their purchase behavior can actually make a difference? If they do, are they willing to pay more for products that possess a normative component? Thus, the objective of this research is to answer these questions.

2. Literature review

2.1 Research constructs

The constructs considered in this study have been tested over the past few years and will be discussed in relation to this study.

PCE is defined as a domain-specific belief similar to self-efficacy in social learning theory, whereby individuals believe their actions make a difference in solving a problem through product purchase decisions (Ellen *et al.*, 1991; Kim and Choi, 2005; Vermeir and Verbeke, 2006; Wesley *et al.*, 2012). Often, individuals are certain that their actions result in particular outcomes and thus bring about change, while others have little confidence in their ability to make a difference (Kim and Choi, 2005). Thus, PCE is situation- or issue-specific and this personal belief might be formed under the influence of more general or abstract value orientations (Tan, 2011).

Tan (2011) found that among the top ten predictors of PE unease, PCE was strongest with individuals who felt their efforts could be useful toward environmental change. Vermeir and Verbeke (2006) suggested that PCE is necessary to motivate consumers to express their positive attitudes towards PE products in actual consumption situations, while Kabadaynet *al.* (2015) suggested that high PCE is crucial to consumers with positive attitudes for PE consumption, as they believe that their efforts have an impact on solving environmental issues.

Another reason that individuals may be predisposed to PE purchasing prejudice might be SDB (Schlegelmilch *et al.*, 1996; Follows and Jobber, 2000). SDB is the magnitude to which people respond in socially acceptable terms to gain approval from others. In consumer market research, those influenced by SDB could over-report “desirable” actions and under-report “undesirable” ones (Bishop and Barber, 2015; Sun and Morwitz, 2010; Schlegelmilch *et al.*, 1996), in particular PE purchasing measures that are self-reported, thus artificially exaggerating their actual levels of purchase behavior. They recommend investigating the consistency between self-reported and actual PE purchasing behavior.

Another reason is *Normative Theory* – the informal rules that govern the particular way and how one should or should not act in a given situation – which influences how individuals behave (Bagozzi *et al.*, 2014; Varemans, 2008; Ajzen, 1991). Prescriptive norms stem from normative theory and represent what people ought to do given certain situations (Vareman, 2008), creating situational-dependent and not necessarily lasting characteristics of an individual.

Through studies on purchasing organic or local food, normative beliefs (NBs) have been strong positive predictors of stated WTP (Bishop and Barber, 2015; Dean *et al.*, 2008; Thøgersen, 2002; Tarkiainen and Sundqvist, 2005; Spash *et al.*, 2009; Voon *et al.*, 2011). At the individual level, pro-environmental concern may not be the socially accepted norm (Johnson, 2011) as individuals with low WTP for PE products may be less vulnerable to normative pressure. However, Bishop and Barber (2015) found no significant relationship between NB and actual WTP behavior for pro-environmental products.

2.2 Willingness to pay

WTP is a measurement of intention often used in market research to gauge the maximum amount a buyer is prepared to pay for a particular brand, product or service (Koschate-Fischer *et al.*, 2012; Franke *et al.*, 2008). Accurately estimating consumers' actual WTP is critical in many circumstances, including when developing new or promoting existing offerings (Miller *et al.*, 2011) and executing varying pricing strategies (Gu and Yang, 2010). Still, measuring actual WTP of a consumer can be a perplexing task because of the difficulty of obtaining the specific data required (Franke and Piller, 2004). Recent studies (Barber and Taylor, 2013; Remar *et al.*, 2016) have begun this task by using experimental designs to capture actual purchase behavior.

2.3 Demographics

Several studies (Grail Research, 2009; Diamantopoulos *et al.*, 2003; Barber *et al.*, 2012) have attempted to identify demographic characteristics or psychometric measures of consumer PE commitment. These studies suggest product selections can be influenced by value, concerns and individual responses to social and institutional norms. With increasing pro-environmental concerns, consumers now frequently make purchase decisions based on how products satisfy their needs, while also minimizing the negative impact on the natural environment (Bennett and Williams, 2011; Torgler *et al.*, 2008).

The overall objective of this research was to consider whether PCE and SDB influence people's actual WTP for PE wine products despite NBs, providing suggestions to marketers based upon the results. Two independent studies were performed to test the concepts of NB and WTP, controlling for PCE and SDB.

3. Research methodology

To assess the overall objective of this research, two studies were conducted in the USA, comparing PE and conventional wine. Each study involved surveying participants as to their NB, SDB, PCE, demographics and measuring their actual WTP through experimental auctions. The experimental auctions follow the work by Combris *et al.* (2006), Bazoche *et al.* (2008, 2009) and Barber *et al.* (2012).

3.1 Recruitment of participants

Prospective participants were recruited randomly from two different wine retail stores in geographically separate parts of New England. The potential participants were asked whether they would be willing to participate in both the survey and the auction (Barber *et al.*, 2012). Individuals agreeing to participate in both had to be 21 years of age or older and must be red wine drinkers. If they did not meet these criteria, the researcher moved on to another individual. Each participant was informed that a \$20 participation fee would be paid at the end of the auction, and although this fee could be considered an endowment, Loureiro *et al.* (2003) suggested an endowment of similar value of the item auctioned should not have a significant impact on the experiment. In our study, the average price consumers pay for a bottle of wine is roughly \$15.00.

3.2 Survey procedures

Participants were provided a URL link to an online survey with instructions on when and where to meet for the auction with sections addressing each of the study measurement constructs. A follow-up e-mail with the URL link was sent after one week and again two weeks later. A reminder e-mail about the auction was sent to the participants at the end of week four:

- For SDB, respondents answered questions based on the 13-item (true/false), shortened form of the Crowne and Marlowe (1960) scale as outlined by Ballard (1992) and recommended by Loo and Loewen (2004). Scale reliability was $KR\ 20 = 0.81$. Respondents received a point each time they answered in a socially desirable manner.
- PCE used the scales, modified for this study, from Kabadayı *et al.* (2015) and Ellen *et al.* (1991). The PCE measures were “My purchase behavior has a direct impact on the environment”, “When I purchase local pro-environmental products, it strongly affects the environment” and “I believe that I can make a difference in the environment by purchasing pro-environmental products”. The seven-point scale results were $\alpha = 0.92$, factor loading = 0.88-0.92.
- Prescriptive normative pressure (Bishop and Barber, 2015) used two five-point statements related to the level of agreement whether people in general should purchase PE products and whether and individual should purchase PE products, with results $\alpha = 0.80$ and factor loading = 0.81-0.85.

The survey ended with demographic questions of age (Kollmuss and Agyeman, 2002), gender (Barber *et al.*, 2012; Hunter *et al.*, 2004; Laroche *et al.*, 2001), education (Guagnano and Markee, 1995) and level of income (Diamantopoulos *et al.*, 2003).

3.3 Experimental auction procedural sequencing

The experimental auction, which began four weeks after the survey ended, assessed participants using the procedures described below (Combris *et al.*, 2006; Bazoche *et al.*, 2009; Barber *et al.*, 2012). Morwitz *et al.* (2007) expressed concern about the influence of time between survey intent and behavior measurement, whereby shorter intervals could be significantly associated with higher intent – behavior associations depending on the category of product under examination (is durable versus non-durable). Because wine is an everyday consumable and a non-durable product, any priming effects due to the four-week timeframe should not be a concern.

A second-price Vickrey auction (Vickrey, 1961), an incentive-based method to elicit results, was used to obtain actual WTP, whereby the winner is required to purchase the product at the second highest price (Lusk and Shogren, 2007; Voelckner, 2006):

- Randomly participants were assigned to sessions with the number of people per session dependent on the sample size. A test-run auction was held with an alternative product to address the concern respondents may not truly understand the auction process. They were seated to avoid the opportunity to communicate with each other.
- During three different informational situations: blind tasting (no information), partial information (the description alone) and full information (the description plus tasting), participants evaluated (tasted or visually assessed) the wine in a pre-established order controlling for the impact of presentation order on the assessment. Brand names were removed to avoid the influence of brand recognition during the evaluation process. To control for any differences and eliminate potential impact of taste during the full information situation, a manipulation check of the blind tasting situation was used to establish the equivalence of products in terms of likability based on bid prices and taste. The likability evaluation measures were from Townsend and Campbell (2004). The measures were “How would you rate the taste of this wine?” and “I really like this wine a lot”, with results of ($\alpha = 0.90$) and factor loading = 0.89-0.92. If no significant differences existed between or within groups based upon blind tasting bid prices or likability scores, then the influence of taste should be minimal during the full information situation. When explaining the experimental procedure, the participants were never told the wines presented in the two situations would be the same wines.
- The bidding used a reference price (Chernev, 2003) provided from what consumers actually pay for conventional wine products at a local retail store. After evaluating each wine, participants wrote down the maximum price for the product assuming the product would be auctioned at the end of the experiment. This prevents any revision of their valuations with hindsight after experiencing the other product or situation. The bid prices from the partial and full information situations were averaged creating a composite price score. A “difference” in actual composite scores was calculated by subtracting the PE product composite price from the non-PE product composite price.
- The experiment considered potential issues of same subject response by the randomization of products. Participants, prior to the bidding, were informed that only the bids from one situation (partial information or full information) would be used and they would be randomly selected by one participant. This helps to avoid strategic behavior leading participants to submit a higher reservation price only in situations they preferred. The participant who submitted the highest price became the winner and had to pay for the product at the level of the second highest bid.

After all bids were submitted (partial information or full information only), a manipulation check was completed where participants indicated whether each of the

wines tested were PE or not, on a five-point Likert-type scale, ranging from 1 (not PE) to 5 (very PE), prompted by the question “To what extent is this wine PE?”

3.4 Analysis of covariance

Study 1 and 2 set out to examine if PCE and SDB were leading to an overstatement in consumers' WTP. A one-way analysis of covariance (ANCOVA) was conducted. The independent variable, NBs, involved three levels: high, moderate and low. The dependent variable was the gap in price between the actual WTP for the PE wine product and the non-PE wine product. Participants' scores on the survey for PCE and SDB were used as the covariates.

4. Results

4.1 Study 1

In total, 117 individuals participated in both phases of the study. The manipulation check indicated that consumers found the PE wine to be very PE ($M = 4.8$, $SD = 0.6$), and respondents found the non-PE wine to be not PE ($M = 1.8$, $SD = 0.9$). Controlling for differences in likability and potential impact of taste during the full information situation, no significant differences existed between or within groups based upon blind tasting bid prices or likability scores (Table I).

4.1.1 Study 1 survey results

4.1.1.1 Descriptive survey statistics. Table II provides the first sample's descriptive statistics. An ANOVA of the descriptive demographics showed no significant differences between age, income, number of years consuming wine and average number of bottles consumed per month.

4.1.1.2 Normative beliefs. Following previous research, a new variable for NB was created. Bishop and Barber (2015) and Barber and Taylor (2013), following Zaichkowsky (1985), suggested that by using the overall distribution as a guide to classification, comparisons can be made between subjects. Individuals were categorized into three groups, those with high, moderate or low NB. The “high” category consisted of those scoring equal to or higher than the mean plus one standard deviation ($n = 23$). The “moderate” was the mean ($n = 74$) and the “low” category was the mean less than one standard deviation ($n = 20$).

4.1.1.3 Perceived consumer effectiveness. ANOVA results showed PCE was statistically significant ($F(2,114) = 9.55$, $p < 0.05$), with *post hoc* analyses using Scheffé's method, indicating that the high NB group responded significantly ($p < 0.05$) with the highest level of PCE ($M = 6.2$), compared to those of the moderate ($M = 5.1$) and low NB groups ($M = 4.4$). A significant difference ($p < 0.05$) existed between the moderate and low NB groups.

4.1.1.4 Social desirability bias. ANOVA showed SDB was significant ($F(2,114) = 12.82$, $p < 0.05$) with *post hoc* analyses using Scheffé's method, indicating that the high NB group responded significantly ($p < 0.05$) with the highest level of SDB ($M = 10.8$), compared to those of the moderate ($M = 6.4$) and low NB groups ($M = 4.9$). A significant difference ($p < 0.05$) existed between the moderate and low NB groups.

4.1.2 Study 1 auction results. Each participant made four bids and 117 subjects took part in the sessions, yielding 468 bid prices. A reference price of \$15 was provided based upon the average price consumers pay in this market area (Table III).

Blind situation only	Blind situation overall	High normative beliefs (<i>n</i> = 23)	Moderate normative beliefs (<i>n</i> = 74)	Low normative beliefs (<i>n</i> = 20)	Pairwise testing
PE wine product	\$15.58	\$15.68	\$15.57	\$15.49	$F(2,114) = 1.07, p > 0.05$
Non-PE wine product	\$15.55	\$15.66	\$15.53	\$15.48	$F(2,114) = 0.98, p > 0.05$
Difference in price	\$0.03	\$0.02	\$0.04	\$0.01	$F(2,114) = 1.19, p > 0.05$
<i>t</i> -test overall and within each cluster	$t(116) = 0.77$ $p > 0.05$	$t(22) = 0.15$ $p > 0.05$	$t(73) = 0.64$ $p > 0.05$	$t(19) = 0.26$ $p > 0.05$	
Likability (Taste) PE Wine*	4.8	4.8	4.9	4.7	$F(2,114) = 0.83, p > 0.05$
Likability (Taste) Non-PE Wine*	4.7	4.7	4.8	4.6	$F(2,114) = 1.22, p > 0.05$

Notes: * After the blind tasting, participants were asked: "how would you rate the taste of this wine?" on a scale from 1-5 (1 = did not like it at all; 5 = liked it very much)

Table I.
Study 1 mean auction between and within groups (*n* = 117)

Overall results	Overall	High normative beliefs (<i>n</i> = 23)	Moderate normative beliefs (<i>n</i> = 74)	Low normative beliefs (<i>n</i> = 20)
Average age ^a	45	46	44	47
<i>Gender</i>				
Male (%)	46	46	47	45
Female (%)	54	54	53	55
<i>Education</i>				
Trade or technical (%)	1		2	1
Some college (%)	6	7	5	8
Undergraduate degree (%)	86	85	87	86
Graduate degree (%)	6	6	6	5
Professional degree (Law, etc.) (%)		2		
Average income ^b	\$62,915	\$61,250	\$63,450	\$62,850
Average number of years consuming wine ^c	25	26	24	27
Average number of bottles consumed per month ^d	14	14	15	12
Social desirability bias ^e	7.0	10.8	6.4	4.9
PCE ^f	5.2	6.2	5.1	4.4

Table II.
Study 1

demographics and other variables by normative beliefs (*n* = 117)

Notes: Results of analysis of variance procedures: ^a = not significantly different, $F(2,114) = 0.78, p > 0.05$; ^b = not significantly different, $F(2,114) = 1.11, p > 0.05$; ^c = not significantly different, $F(2,114) = 1.17, p > 0.05$; ^d = not significantly different, $F(2,114) = 0.77, p > 0.05$; ^e = significantly different, $F(2,114) = 12.82, p < 0.05$; ^f = significantly different, $F(2,114) = 9.55, p < 0.05$

In the low NB respondents, there was a statistical difference between the auction bid prices for PE and non-PE wines ($t(19) = 17.26, p < 0.05$). This group reported an average bid price of \$13.69 for the PE wine, whereas their auction bid price for the non-PE wine was \$15.89. For moderate NB consumers, the average bid prices were not statistically different ($t(73) = 1.08, p > 0.05$), reporting \$16.11 for the PE wine compared to \$15.93 for the non-PE wine. Finally, high NB consumers reported statistically significant differences ($t(22) = 18.11, p < 0.05$) with an average bid of \$18.95 for the PE wine, compared to \$16.05 for the non-PE wine. ANOVA showed no significant statistical differences between NB groups in terms of their actual WTP at the auction for non-PE wine ($F(2,114) = 0.93, p > 0.05$).

4.1.3 Study 1 analysis of covariance results. A correlation analysis showed the two covariates had a low correlation with each other at $r = 0.116$. Nevertheless, the assumptions for ANCOVA (e.g. normality, linearity and homogeneity of variances) were met. In particular, the homogeneity of the regression effect was evident ($p > 0.05$) for each covariate, and each covariate was linearly related to the dependent measure. ANCOVA revealed that both PCE ($F(1, 112) = 4.73, p < 0.05, \eta^2 = 0.06$) and SDB ($F(1, 112) = 6.87, p < 0.05, \eta^2 = 0.08$) were significant covariates. When controlling for these, the differences between actual WTP were not significant between NB groups ($F(2, 114) = 1.04, p > 0.05$). These results suggest that higher NB respondents are

(Label and full information situations only)	Overall	High normative beliefs ($n = 23$)	Moderate normative beliefs ($n = 74$)	Low normative beliefs ($n = 20$)	Pairwise testing
PE wine product	\$16.25	\$18.95	\$16.11	\$13.69	$F(2,114) = 216.33, p < 0.00$
Non-PE wine product	\$15.97	\$16.05	\$15.93	\$15.89	$F(2,114) = 0.93, p > 0.05$
Difference in price	\$0.28	\$2.90	\$0.18	-\$2.20	$F(2,114) = 202.66, p < 0.05$
% premium(discount) paid	1.8	18.1	1.1	(13.8)	
t -test overall and within each cluster	$t(116) = 0.95$ $p > 0.05$	$t(22) = 18.11$ $p < 0.05$	$t(73) = 1.08$ $p > 0.05$	$t(19) = 17.26$ $p < 0.05$	

Table III.
Study 1 mean auction between and within groups ($n = 117$)

influenced by both PCE and SDB when considering their actual WTP for products that may be more socially desirable, such as environmentally friendly offerings. Meanwhile, the low NB group showed lower levels of both PCE when purchasing PE products, as well as SDB, indicating they do not feel the same control their purchase decisions have or pressure to please or gain the approval of others. For the largest group, the moderate NB reported a slight lean toward PCE ($M = 5.1$ out of 7 points), while scoring lower on the SDB construct ($M = 6.4$ out of 13 points), suggesting they feel less influenced by social desirability and have some level of perceived control. They also bid nearly the same for the PE wine compared to the non-PE wine (bid price difference \$.18 or 1.1 per cent premium).

4.2 Study 2

Study 2 used a different data set, with 124 participating in both phases of the study. The manipulation check indicated that consumers found the PE wine to be very PE ($M = 4.9$ $SD = 0.9$) and respondents found the non-PE wine to be not PE ($M = 1.6$, $SD = 0.5$). Controlling for sensory differences, eliminating potential impact of taste during the full information situation, no significant differences existed between or within groups based upon blind tasting bid prices or likability scores (Table IV).

4.2.1 Study 2 survey results

4.2.1.1 Descriptive survey statistics. Table V provides the second sample's descriptive statistics. An ANOVA of the descriptive demographics showed no significant differences between age, income, number of years consuming wine and average number of bottles consumed per month. The only significant differences were found between groups on SDB and PCE.

4.2.1.2 Normative beliefs. Following Study 1, a new variable for NBs was created with the "high" category of those scoring equal to or higher than the mean plus one standard deviation ($n = 23$), the "moderate" ($n = 75$) and the "low" category ($n = 26$).

4.2.1.3 Perceived consumer effectiveness. ANOVA results showed that PCE was statistically significantly different ($F(2,121) = 22.18, p < 0.05$) between NB groups. *Post hoc* analyses using Scheffé's method indicated that the high NB group responded significantly ($p < 0.05$) with the highest level of PCE ($M = 6.7$) compared to those of the moderate ($M = 5.8$) and low NB groups ($M = 4.6$).

4.2.1.4 Social desirability bias. ANOVA showed that SDB was significantly different ($F(2,121) = 25.37, p < 0.05$). *Post hoc* analyses using Scheffé's method indicated the high NB group responded significantly ($p < 0.05$) with the highest level of SDB ($M = 10.4$), compared to those of the moderate ($M = 5.9$) and low NB groups ($M = 4.5$).

4.2.2 Study 2 auction results. Each participant made four bids and 124 subjects took part in the sessions, yielding 496 bid prices with a reference price of \$15 provided.

In the low NB respondents, there was a statistical difference between the auction bid prices for PE and non-PE wines ($t(25) = 101.66, p < 0.05$). This group reported an average bid price of \$13.37 for the PE wine, whereas their auction bid price for the non-PE wine was \$15.97. For moderate NB consumers, the average bid prices were statistically different ($t(74) = 0.64, p > 0.05$), reporting \$16.22 for the PE wine compared to \$16.05 for the non-PE wine. Finally, high NB consumers reported statistically significant differences ($t(22) = 59.67, p < 0.05$) with an average bid of \$19.35 for the PE wine, compared to \$16.10 for the non-PE wine. ANOVA showed no significant statistical

Blind situation only	Blind taste overall	High normative beliefs ($n = 23$)	Moderate normative beliefs ($n = 75$)	Low normative beliefs ($n = 26$)	Pairwise testing
PE wine product	\$15.29	\$15.33	\$15.28	\$15.30	$F(2,121) = 0.86, p > 0.05$
Non-PE wine product	\$15.27	\$15.31	\$15.26	\$15.27	$F(2,121) = 0.91, p > 0.05$
Difference in price	\$0.02	\$0.02	\$0.02	\$0.03	$F(2,121) = 0.85, p > 0.05$
t -test overall and within each cluster	$t(123) = 0.77$ $p > 0.05$	$t(22) = 0.15$ $p > 0.05$	$t(74) = 0.64$ $p > 0.05$	$t(25) = 0.26$ $p > 0.05$	
Likability (Taste) PE Wine*	4.7	4.6	4.8	4.7	$F(2,121) = 0.49, p > 0.05$
Likability (Taste) Non-PE Wine*	4.6	4.7	4.6	4.7	$F(2,121) = 0.77, p > 0.05$

Notes: * After the blind tasting, participants were asked: "how would you rate the taste of this wine?" on a scale from 1-5 (1 = did not like it at all; 5 = liked it very much)

Table IV.
Study 2 mean auction between and within groups ($n = 124$)

Overall results	Overall	High normative beliefs (<i>n</i> = 23)	Moderate normative beliefs (<i>n</i> = 75)	Low normative beliefs (<i>n</i> = 26)
Average age ^a	45	47	44	46
<i>Gender</i>				
Male (%)	45	47	45	44
Female (%)	55	53	55	56
<i>Education</i>				
Trade or technical (%)	1		2	1
Some college (%)	6	6	6	8
Undergraduate degree (%)	85	86	85	86
Graduate degree (%)	6	7	6	5
Professional degree (Law, etc.) (%)	1	1	1	
Average income ^b	\$63,910	\$63,775	\$64,250	\$63,050
Average number of years consuming wine ^c	23	26	22	25
Average number of bottles consumed per month ^d	13	14	13	13
Social desirability bias ^e	6.4	10.4	5.9	4.5
PCE ^f	5.7	6.7	5.8	4.6

Table V.
Study 2
demographics and other variables by purchase normative beliefs (*n* = 124)

Notes: Results of analysis of variance procedures: ^a = not significantly different, $F(2,121) = 1.29, p > 0.05$; ^b = not significantly different, $F(2,121) = 0.91, p > 0.05$; ^c = not significantly different, $F(2,121) = 0.95, p > 0.05$; ^d = not significantly different, $F(2,121) = 0.25, p > 0.05$; ^e = significantly different, $F(2,121) = 25.37, p < 0.05$; ^f = significantly different, $F(2,121) = 22.18, p < 0.05$

differences between NB groups in terms of their actual WTP at the auction for non-PE wine ($F(2,121) = 1.89, p > 0.05$) (Table VI).

4.2.3 Study 2 analysis of covariance results. A correlation analysis showed the two covariates had a low correlation with each other at $r = 0.202$. However, the assumptions for ANCOVA were met. In particular, the homogeneity of the regression effect was evident ($p > 0.05$) for each covariate, and each covariate was linearly related to the dependent measure. ANCOVA revealed that both PCE ($F(1, 119) = 8.14, p < 0.05, \eta^2 = 0.07$) and SDB ($F(1, 119) = 10.27, p < 0.05, \eta^2 = 0.06$) were significant covariates. Controlling for these, the differences between actual WTP were not significant between NB groups ($F(2, 121) = 0.988, p > 0.05$). These results suggest higher NB respondents are influenced by both PCE and SDB when considering their actual WTP for products that may be more socially desirable, such as environmentally friendly offerings. Meanwhile, the low NB group showed lower levels of both PCE when purchasing PE products, as well as SDB, indicating they may not feel the same control (or possibly desire to) over their purchase decisions or pressure to please or gain the approval of others. Similar to Study 1, the largest group, the moderate NB reported a lean toward PCE [$M = 5.8$ out of 7 points], while scoring lower on the SDB construct [$M = 5.9$ out of 13 points], suggesting that they feel less influenced by social desirability and have a

(Label and full information situations only)	Overall	High normative beliefs ($n = 23$)	Moderate normative beliefs ($n = 75$)	Low normative beliefs ($n = 26$)	Pairwise testing
PE wine product	\$16.35	\$19.35	\$16.22	\$13.37	$F(2,121) = 198.34, p < 0.05$
Non-PE wine product	\$15.98	\$16.10	\$16.05	\$15.97	$F(2,121) = 1.89, p > 0.05$
Difference in price	\$0.37	\$3.25	\$0.17	(\$2.60)	$F(2,121) = 189.65, p < 0.05$
% premium(discount) paid	2.3	20.2	1.1	(16.3)	
t -test overall and within each cluster	$t(123) = 2.11$ $p > 0.05$	$t(22) = 59.67$ $p < 0.05$	$t(74) = 0.91$ $p > 0.05$	$t(25) = 101.66$ $p < 0.05$	

Table VI.
Study 2 mean auction between and within groups ($n = 124$)

level of perceived control. They also bid nearly the same for the PE wine compared to the non-PE wine [bid price difference \$.17 or 1.1 per cent premium].

5. Discussion

This study attempted to establish if people feel their purchase behavior actually makes a difference and if so, are they willing to pay more for products that possess a normative component. This was determined by controlling for PCE and SDB. The findings from the current research can provide important information for wine producers, distributors and retailers, specifically in the development of marketing and branding strategies, and as a method of product/brand differentiation in a continuously competitive marketplace.

Given the strong similarities of the results in both studies, we have combined the discussion. First, based on the average auction results for both studies, consumers with higher levels of NBs were significantly likely to pay more for PE wines compared to non-PE wines ($M = 3.08$ per cent; $M = 19$ per cent, respectively) with a higher level of PCE suggesting that they strongly believe their purchase behavior makes a difference to the environment. However, this same group is strongly influenced by SDB, indicating they may “over-report” desirable behaviors. This was confirmed when controlling for the influence of PCE and SDB, where the significant difference in price for PE wine and non-PE wine was mitigated.

At the other end, the low NB group was significantly likely to pay less for PE wines compared to non-PE wines ($M = 0.18$ per cent; $M = -15$ per cent, respectively). This group had a lower level of PCE, suggesting that they do not believe their purchase behavior makes a difference to the environment and are not influenced by SDB. This too was confirmed, when controlling for the influence of PCE and SDB, whereby the significant difference in price for PE wine and non-PE wine was mitigated. This point, may suggest just the opposite of the high NB group. It may not be a lack of belief their purchase behavior will directly impact the environment, but rather they may:

- feel non-PE wines are a better value proposition, as found in the studies by Loureiro *et al.* (2003) and GFK Roper Consulting (2007); and/or
- may avoid them because of past experiences with poor-/low-quality bottles or have heard stories about other people’s experiences with low-quality bottles of PE wines.

As suggested by Bishop and Barber (2014) and Sun and Morwitz (2010), those influenced by SDB could possibility over-report “desirable” actions and under-report “undesirable” ones. These were clearly evident in the results of the high NB and low NB groups in this study. Vareman (2008) proposed that the normative message can appeal to an individual’s norms, suggesting the particular way and how one should or should not act in a given situation. By removing the message, these assumptions were confirmed through the blind tasting, where there was no difference in price for either wine by high NB or low NB when no information was provided in either study.

Of considerable interest from the two studies are those in the moderate NB price premium group who are somewhere in between the previously described two groups in how they categorize their actual behavior, the level of PCE and SDB. In numerous ways,

they seem open to PE behavior, displaying some concern but not guiding the way for others. For example, in both studies, they were in the middle on PCE (leaning slightly to feeling in control – $M = 5.5$ on a seven-point scale) and had a price premium of only $M = 1$ per cent ($M = 0.18$). This group represented 64 per cent of both studies participants, 40 per cent of all sample males, 45 per cent of the females and 90 per cent of this group had earned a college degree, and with an average income of \$63,500. These findings, relative to WTP, parallel the general assessment of PE behavior in the USA as demonstrated by Bennett and Williams (2011). They found that most American consumers are neither in the middle ground of “hard-core PE” nor are they unmindful of the problems.

Marketing has acknowledged its purpose is to serve the good of society by promoting the availability of goods and services that may improve their quality of life. Nevertheless, this is only true if the promotional message assists in informing, educating and channeling the needs of all potential consumers toward PE products (Barber *et al.*, 2010). However, consumer markets are varied, and developing strategies to influence all consumers at the same time can be daunting. Without a doubt, raising consumers’ awareness of environmental issues related to wine production needs to be targeted accordingly. This may be accomplished through matching the messages about PE wine production to the recipient group. As noted by Roberts and Bacon (1997, p. 86) many consumers do not have the necessary knowledge to make comprehensive pro-environmental decisions, suggesting that educating consumers on pro-environmental issues will be important to encourage ecologically conscious decision-making in the consumer marketplace.

6. Managerial implications with conclusions

This research has some practical implications. Changing consumer decision-making from automatic to thoughtful processing and from socially concerned to individual processing can lead to more “controllable” and predictable PE consumption behavior. Individual decision-makers base their behavioral intention on their NBs, PCE and availability; each that can be altered by well-developed communication strategies. Consumers’ NBs can be made positive and the perception of control through purchase behavior enhanced, if the “right message is delivered”, through a specific strategy for a specific segment (e.g. focusing on mainstream consumers).

Marketers involved in PE purchase behavior should recognize the significance of PCE for a consumer by highlighting the positive contribution of PE behavior through the information and emotions delivered by different channels. PE marketers can increase PCE through providing consumers with specifics about how their pro-environmental purchase behavior can effectively make a difference. For example, the back label could show savings of carbon emissions associated with manufacturing and transporting lighter-weight wine bottles [e.g. “By purchasing this bottle you saved X% of carbon emissions”]. Conceivably, another tactic to induce consumers toward changing their PE behavior, particularly the low and moderate PCE groups which have the most potential for developing higher PCE, could be rewarding higher loyalty points, such as those offered at US grocery stores (Horowitz, 2014), by encouraging wine shoppers to purchase PE wine or other products.

In addition, the sense of product availability can be heightened by providing consumers with solutions to their acquisition problems, such as providing wine consumers the variety of PE products and store listings, where the PE products can

be found. However, this emphasis should not preclude improving consumer access to PE wine products through more localized outlets, such as local food shops and wineries, where improving their convenience and logistical efficiency should be considered. Furthermore, PCE can be enhanced by providing consumers with examples that demonstrate their behavior can effectively make a difference (e.g. buying local/regional wine products supports local economies and the surrounding landscape).

Another way to enhance PCE is for PE behavior to be perceived as mainstream in the marketplace. In this study, the largest group, moderate price, had the lowest price premium, with middle of road PCE. Perhaps as suggested by Başgöze and Tektaş (2012), the purchasing of organic foods or using energy-saving devices have not successfully been targeted to the everyday consumer; thus, they may not feel the need to conform (GKF, 2007; Bennett and Williams, 2011). Bennett and Williams (2011) and Ottman (2011) came to the same conclusion when discussing PE products. These studies suggested that mainstream consumers do not feel the need to conform, are neutral as to influence of their purchase behavior; yet, they do not want to seem different from everyone else, rather seeming to fit in. The use of social media marketing could be a significant driver to increase these individual's PE consumption through NBs [e.g. I/People in general should purchase environmentally produced products]. Community-based social marketing has not always transcended the barrier between raising awareness and actual behavior change, particularly when it comes to complex issues such as PE consumer behavior. However, it has proven to be an effective method of affecting actual attitudinal and behavioral change, drawing from social science research with an interactive approach to information delivery (Cialdini, 2003). For example, using pictures and videos of wine consumers (e.g. "like me") engaging in PE-friendly behavior is a simple and effective way of generating a sense of social normality around wine consumption and purchasing. Thus, when social norms can be combined with "intrinsic" motivations (e.g. a sense of social belonging), they are likely to be more effective and persistent.

The first limitation of this study is the use of an auction method to assess actual behavior. Voelckner (2006) suggests that researchers may not be able to depend on auction participants' positive valuations because the participant's goal may be skewed by the attempt to get a winning bid. Still, in experimental research, simulations (such as the Vickrey auction) are commonly used to assess actual behavior and to test theory because of the requirement of the commitment of actual money and because they have been seen to create an incentive to divulge actual reservation prices (Noussair *et al.*, 2004).

Second, this research was conducted in one particular part of the USA, which limits the generalizability of the results to other parts of the country or world.

Future research should look more specifically at the influence of guilt or fear on NB. Secondly, it would be advantageous to identify other possible causes, beyond NB, that might relate to the price discount observed for respondents with low NBs, such as self-enhancement and transcendence. Finally, during the auction process, enhancing the sensory measurement may offer additional insights into the bidding outcomes.

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