The Effects of Consideration of Future and Immediate Consequences on Willingness to Pay for Eco-Friendly Plant Attributes[1]

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Abstract

We investigated how differences in the consideration of future consequences (CFC) in uence consumers' willingness to pay for edible and ornamental plants using data from plant auction experiments conducted in the U.S. and Canada. Speci cally, the study focused on individuals' preferences for plant attributes related to production method, container type, and product origin. Individuals assigning higher importance to future consequences of their current decisions were willing to pay a price premium for plants grown using sustainable (16.7 cents) and energy-saving (16.5 cents) production methods, non-conventional containers such as compostable (18.2 cents) and plantable (14.3 cents), and locally produced plants (15.3 cents), and they expected a discount (37.8 cents) to purchase imported plants (i.e., produced outside the U.S.). In contrast, individuals assigning higher importance to immediate outcomes of their decisions were not willing to pay a price premium for the above mentioned attributes, with the exception of water-saving and compostable ones. The results contribute to our understanding of the effects of temporal considerations on choice decision making by horticultural consumers, and provide horticultural marketers with an opportunity to effectively position products that provide long- or short-term bene ts.

Index words: conjoint analysis, consumer behavior, experimental auctions, second-price auctions, price premiums, environmental attributes, choice of plants.

Signi cance to the Nursery Industry

Understanding the extent to which the consumers assign importance to immediate vs. future consequences provides horticultural marketers with an opportunity to effectively position products that provide long-term or immediate bene ts. Communicating product attributes that provide long-term health or well-being bene ts will help to effectively target horticultural consumers who assign higher importance to distant (as opposed to immediate) consequences.

Introduction

The green industry has experienced unprecedented growth, innovation, and change over the last two decades, during which it has been among the fastest growing agricultural industries in the United States, primarily due to robust demand from commercial and residential construction. Total economic contributions for the U.S. green industry in 2007, including regional economic multiplier effects, were estimated at $175.26 billion (B) in output (revenue), employment of 1.95 million (M) full-time and part-time jobs, labor earnings of $53.16 B, and $107.16 B in value added (Hodges et al. 2011). However, the economic recession of 2007–2009, coupled with maturing consumer demand and competitive business landscape, has placed considerable nancial pressure on the industry (Hall 2010).

Business survival in the next decade will require a progressive mindset and a willingness to strengthen existing or develop new core competencies or markets, which may incur greater risk. While the outlook may be somewhat uncertain in terms of the growth and nature of consumer demand, it is clear that innovativeness will continue to be a requisite skill in ensuring the survivability and pro tability of green industry rms in the future. Much of this innovativeness must be focused on enhancing the value proposition offered by industry rms by emphasizing the economic, social (e.g., health and well-being), and environmental (e.g., energy/water saving production methods, or use of recyclable/compostable containers) bene ts that green industry products and services offer to end consumers (Hall and Dickson 2011). Accordingly, understanding individual consumer preferences and willingness to pay (WTP) for green industry products and certain characteristics (e.g., plants grown using water/energy conserving production methods, and compostable, plantable, or recyclable containers) will help support rms' efforts to enhance the value proposition.

The production and marketing of products with eco-friendly characteristics has become an important strategy to attract a target market of environmentally-conscious consumers (Royne et al. 2011; Khachatryan et al. 2014). Most consumer studies hypothesize that consumers 'reward' eco-friendly production practices (e.g., willing to pay premium price), and 'punish' producers of environmentally unsustainable goods (e.g., expecting discounted prices) (Trudel and Cotte 2008). However, considering real market situations, a number of studies also discussed possible deviations from hypothetical WTP commitments made by survey respondents (Murphy et al. 2005; List and Gallet 2001; Adamowicz et al. 1998). The most common method used in consumer research of quantifying nancial 'rewards' is through measuring consumers' WTP a premium or, conversely, measuring the extent to which consumers discount the value of a product by reducing the price they are willing to pay. A recent study

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demonstrated this effect among lawn and garden consumers (in evaluating their responsiveness to carbon footprint labeling) when they exhibited a WTP more for plants labeled as carbon saving versus a discount applied to plants labeled as carbon intensive (Hall et al. 2010).

There are a number of behavioral (pre-decision) mechanisms that play important roles in plant choice/WTP decisions, including individuals' considerations of temporal tradeoffs and/or consequences (Berns et al. 2007; Joireman et al. 2001). Despite their importance in choice decision-making framework (Bénabou and Pycia 2002; Crocker and Shogren 1993), mechanisms for measuring the effects of temporal considerations have received relatively less attention in WTP studies for eco-friendly products and services (Khachatryan et al. 2013). While several studies investigated the temporal sensitivity of WTP decisions for environmental projects such as oyster reef restoration (cf., Kim and Haab 2009), or the relationship between time perspective and environmental attitude (Milfont and Gouveia 2006), the in uence of individual differences in consideration of immediate vs. distant consequences on choice decisions has been overlooked (Joireman et al. 2012; Khachatryan et al. 2013). This study attempts to address that limitation by incorporating consumers' temporal considerations about short- vs. long-term consequences in choice decision-making experiments. In particular, we investigate how differences in the consideration of future consequences (CFC; Strathman et al. 1994; Joireman et al. 2012) in uence consumers' preference and WTP for edible and ornamental plants in second-price silent auction experiments.

To evaluate consumers' preferences and WTP for product attributes, a choice-based conjoint analysis is one of the most commonly utilized frameworks (Bernard et al. 2007; Gallardo et al. 2009; Harrison et al. 2005; Louviere et al. 2008). The choice-based conjoint analysis allows decomposing product attributes and valuing the contribution of each of those attributes to choice decisions. In addition to investigating part-worth utilities for each product attribute, this approach also allows investigating the relationship between choice behavior and socio-demographic characteristics (Caparros et al. 2008; Hensher and Greene 2003; Yue et al. 2009; Yue and Tong 2009). However, several studies criticized the conjoint methodologies that rely on Internet surveys to collect data about WTP for product attributes (Murphy et al. 2005; List and Gallet 2001; Adamowicz et al. 1998). For example, Yue et al. (2009) investigated individuals' WTP behavior for product shown as images compared with WTP behavior for real products, and found that participants tended to overstate their WTP for products shown as images.

One of the relatively recent trends to overcome the above mentioned 'hypothetical commitment' bias is to conduct experimental auctions, which involve exchange of real money for real products (Lusk et al. 2004a). Because of the real money exchange nature of experimental auctions, the participants reveal their true value associated with product attributes (Cummings et al. 1995; List and Shogren 1998; Lusk et al. 2004a). Of the experimental auctions widely used in choice decision tasks, the second-price auction (Vickrey 1961) refers to an auction in which individuals simultaneously submit sealed bids. The winner of the second-price auction is the individual who makes the highest bid, and the product is bought by paying the second highest bid (Shogren et al. 1994; Vickrey 1961). Shogren et al. (2001) showed that the mechanism offered by the second-price auction, in which the nal price equals the rst rejected bid, helps to understand the participants' true willingness to pay for products. A comprehensive discussion of incentive compatibility properties of second-price auctions can be found in Irwin et al. (1998) and Becker et al. (1964).

Consideration of future consequences. There is a theoretical link between temporal considerations and preference for eco-friendly plant attributes. The CFC construct refers to the extent to which people consider potential future outcomes of their current actions or behaviors (Strathman et al. 1994). Results from previous research allow one to generalize that individuals who score high on the CFC scale assign high importance to the distant consequences that may result from their current choices and low importance to immediate consequences or payoffs (Joireman et al. 2001). Conversely, individuals who score low on the CFC scale are those who impart more importance to immediate payoffs, and demonstrate less concern about the long-term consequences of their current actions. Increasingly, the CFC construct is being used in the analysis of individuals' decisions related to environmental, health, and scal responsibility related behaviors (Joireman et al. 2004; Joireman et al. 2005; Joireman et al. 2012), persuasiveness of health-related marketing communications (Orbell and Hagger 2006), studies related to self-control and temporal discounting (Joireman et al. 2008), choice behavior in resource depletion dilemma games (Joireman et al. 2009), and advertisement framing effects (Kees 2011), to name a few.

The CFC scale is composed of two underlying factors: *CFC-immediate* and *CFC-future* (e.g., Joireman et al. 2012; Joireman et al. 2008; Petrocelli 2003; Rappange et al. 2009; Toepoel 2010). According to Joireman et al. (2012), there are a number of theoretical and empirical advantages of using the two-dimensional scale. The main improvement of separating the one dimensional scale is that researchers are able to meaningfully differentiate between two different motivations of underlying behavior — considerations of future and immediate consequences.

To use the unidimensional, 12-item CFC scale, researchers reverse-code the seven immediate items and average them with the ve future items, resulting in a single CFC score (Strathman et al. 1994). While the unidimensional CFC score may reasonably predict proenvironmental behavior, appropriately interpreting the link between CFC scores and behavioral outcomes may not always be straightforward. A key advantage of a two-factor scale is that it permits researchers to explore whether a given behavior is motivated by considerations of *future* or *immediate* consequences as unique predictors. To clarify, consider a situation in which the total score on the unidimensional CFC scale is positively correlated with preference for eco-friendly product attributes. One plausible conclusion is that those who are concerned with future consequences of their current actions are more likely to choose eco-friendly products. However, it can also be reasonably interpreted that the correlation between the CFC score and preferences is entirely attributable to the immediate items, which were reverse-coded in order to build the unidimensional construct.

Similarly, the WTP price premiums for locally-grown plants, or water- and energy-saving production practices in our study may be motivated by consumers' considerations

of both future and/or immediate consequences, as opposed to their overall considerations of future consequences (i.e., total CFC score). In this case, if the overall CFC score is positively correlated with consumers' WTP for water- or energy-conserving plants, then a researcher may conclude that individuals scoring high on the overall CFC score are more likely to choose plants with those eco-friendly characteristics. This interpretation is reasonable, but it ignores the possibility that the above-mentioned positive relationship is driven solely by the seven immediate items in the CFC scale, which were reverse-coded in the conventional, unidimensional construct. These theoretically relevant, but distinctly different interpretations of the CFC effects suggest that individuals' choice behavior may be in uenced by the importance assigned to future consequences, the immediate consequences, or some combination of both (Joireman et al. 2012; Shipp et al. 2009; Zimbardo and Boyd 1999). Based on the empirical results and theoretical motivations provided in the previous studies, we adopted the two-dimensional CFC construct for our study.

In addition to quantifying consumers' willingness to pay premiums for edible and ornamental plants' proenvironmental characteristics, the methodology introduced in the present study (i.e., conjoint analysis and second-price auction experiments) provides further insights about the applications of the consideration of future consequences construct in choice decision models. Findings may contribute to predicting consumer demand for various plant characteristics and production methods, and have practical marketing implications for promoting plants that have been produced using certain eco-friendly production practices. Commercial rms can effectively target environmentally-conscious consumer segments, if individuals' temporal considerations can be meaningfully linked to preferences and WTP for eco-friendly plants.

Hypotheses. In this study, the CFC construct is used to examine the effects of temporal considerations on consumer preferences for plants with eco-friendly characteristics. Based on the previous ndings linking CFC and proenvironmental behavior (e.g., Joireman et al. 2012; Toepoel 2010; Rappange et al. 2009; Joireman et al. 2008; Petrocelli 2003), our hypothesis was that distinct groups of consumers would be concerned about near-term consequences to their purchases and that these consumers would be different from consumers who were more concerned about long-term consequences to their purchase behavior. To test our hypotheses, rst the participants were divided into four clusters: 1) high in CFC-future, 2) low in CFC-future, 3) high in CFC-immediate, and 4) low in CFC-immediate.

We hypothesized that individuals scoring high on the CFC-future subscale would be willing to pay price premiums for plants that are grown with sustainable, energy-saving, or water-saving production methods (Hypothesis 1), for non-conventional containers (Hypothesis 3), and for locally produced plants (Hypothesis 5). In contrast, individuals scoring high on the CFC-immediate subscale would not be willing to pay price premiums for eco-friendly production characteristics (Hypothesis 2), non-conventional containers (Hypothesis 4), and locally produced plants (Hypothesis 6).

Materials and Methods

Participants. The data were collected using non-hypothetical, in-person auction experiments (involving exchange of real money for real plants) in Texas (Texas A&M University campus), Minnesota (University of Minnesota campus), and Ontario, Canada (Vineland Research Company campus), during May 2011. The participants were recruited through multiple channels including advertisements in local newspapers, CraigsList.org, and community newsletters in order to make the recruitment pool as broadly representative of the local area and state/province population as possible. To ensure that participants were regular buyers of plants, we prescreened participants in the advertisement by specifying that 'you have to have purchased plants in the past year and you are at least 18 years old.' To avoid any self-selection bias, the recruitment advertisement indicated that participants would be asked about their market decisions on plant purchases, but nothing was said about details of the plant attributes.

Three auction experiment sessions were held at each of the three locations, and responses from a total of 159 participants were collected during the nine (combined) sessions. Each participant completed only one auction experiment (i.e., participation was not repeated across sessions). The participants had an average age of 50.9 years, which was a bit less representative compared with the U.S. Census estimate of 37.2 years.(US Census Bureau: http://quickfacts.census.gov/qfd/states/00000.html). Eighty-four percent of the participants were Caucasian (U.S. Census average 75%), and 70 were female (compared with the U.S. Census estimate of 51%). The average annual household income of the participants was $65,000 (compared with the U.S. Census average of $52,500).

Auction bidding procedure. To deliver a realistic product choice scenario, the auction experiment was conducted using three different types of live plants. These included food-producing (tomato), edible ornamental herb (basil), and ornamental (yellow chrysanthemum) plants grown in 10.16 cm (4 in) containers (Table 1). Each plant alternative was displayed and labeled with three attributes — 1) production methods, 2) container types, and 3) origin of production. Production methods attribute included four levels — sustainable, energy-saving, water-saving, and conventional (base level). The container type attribute consisted of four levels — compostable, plantable (the container does not need to be removed before planting), recyclable, and conventional plastic containers (base level). Similarly, the origin of production attribute included three levels — local, imported (from outside of the U.S.), and 'grown in this country' level (base level).

Table 1. Plant attributes and levels included in the non-hypothetical auction experiment.

Plant attributes	Levels	Reference group
Production methods	Sustainable, Energy-saving, Water-saving	Conventional
Container types	Compostable, Plantable, Recyclable	Plastic (i.e., conventional)
Origin of production	Local, Imported	Domestic (i.e., grown within this country)

The fractional factorial design routine in SPSS 19.0 software was used, which generated 16 plant scenarios with different combinations of the three attributes described above.

To familiarize participants with the auction procedures, participants practiced in a bidding round using candy bars. Next, the 16 plant alternatives were placed on a large table and beside each alternative there was a label indicating the combination of container type, production method, and product origin. The label for each product was a piece of laminated paper and was placed at a prominent position in front of each plant. Participants walked around the table and placed their bids on their bidding forms as they studied each alternative. Participants were not allowed to communicate with each other during the bidding process. To reduce any systematic ordering effects, the participants could start at any of the alternatives on the table.

After the real auction, the participants were instructed to complete the follow-up questionnaire, which included the 14-item CFC scale (Joireman et al. 2012) and a set of standard socio-demographic related questions. The highest and second highest prices for each alternative were identi ed with the highest bidder paying the second highest price. In the case where a participant won more than one alternative (i.e., his or her bid was the highest for more than one plant), the auction moderator randomly drew the exclusive binding alternative. As a participation incentive, participants were given $30 to compensate for their time, which was stated in the invitation to participate in the auction. At the end of the experiment, if a participant won an alternative, he/she would receive the alternative they won as well as the $30 minus the price for the alternative. If a participant did not win, he/she received the entire $30.

Econometric model. Individual bids (b_{ij}, for participant i and plant j), which can be utilized as participants' WTP for speci c plants and/or attributes, can be represented by the following equation:

$$(1) \qquad b_{ij} = \beta' X_j + \gamma' Z_i + \mu_i + \varepsilon_{ij}$$

where X represents a vector of plant j attributes; Z is a vector of individual i's demographic characteristics; β and γ represent vectors of coef cients to be estimated for plant attributes and demographic variables, respectively. The error term in this speci cation is divided into two parts — individual-speci c random effects component $\mu \sim N(0,\sigma_\mu^2)$, and the idiosyncratic error term $\varepsilon \sim N(0,\sigma_\varepsilon^2)$. The random effects part of the error term (μ) in the mixed linear regression captures individual-speci c characteristics that in uence participants' choice among the 16 alternatives in the experiment. In other words, since each of the participants evaluated 16 different products (with respective varying attribute levels), there is a chance that the bids from the same participant on the 16 alternatives may be correlated (Yue et al. 2010). Therefore, the random individual effect is included to capture that potential correlation. The estimated β coef cients in equation (1) measure differences in WTP for each of the attributes/levels listed in Table 1.

Auction experiment participants' responses to the CFC-future and CFC-immediate subscales were used to investigate if distinct market segments exist among consumers based on the importance that the consumers assigned to future and immediate consequences of their choice decisions. To segment the observations based on the CFC scores, we conducted k-medians cluster split (Osei-Bryson et al. 2014) using CFC-future and CFC-immediate subscales. According to the k-medians split, the cutoff score between CFC-future subscale's high and low clusters was 5.43. The cutoff score for the high and low clusters of the CFC-immediate subscale was 3.14. Accordingly, we estimated four models — two for the high and low clusters based on the CFC-future subscale, and two models based on the high and low clusters of the CFC-immediate subscale.

The linear mixed model described above was used for the subsets of data in order to investigate differences in participant preference and WTP for the studied attributes. The results based on the CFC-future and CFC-immediate subscales then were compared to the base model, i.e., the model in which the participants were not separated by CFC-future and CFC-immediate subscales. Socio-demographic variables were included in the model to control for possible differences in these variables.

Results and Discussion

The WTP results from ve regression models were summarized in Table 2. Results from the base model (i.e., without the CFC clusters) showed that compared with plants grown using conventional methods, participants were willing to pay a higher premium for plants produced using sustainable, energy-saving, or water-saving production methods (Table 2; column labeled 'Base Model'). The average premiums were comparable for the plants produced using the three production methods, which were estimated to be 11.9, 15.6, and 13.6 cents, respectively. The WTP estimates for the base model are shown in the rst column of Table 2. Compared with conventional plastic containers (i.e., the referent level), participants were willing to pay the highest premium for compostable containers (14.7 cents), followed by plants grown in plantable containers (13.9 cents). Participants' WTP for plants grown in recyclable containers did not differ signi cantly from their WTP for plants grown in plastic (i.e., conventional) containers.

Participants expressed willingness to pay a price premium of 12.6 cents for locally produced plants, but they would purchase imported plants at a 35.2 cents discount, compared with domestic (but not local) plants (Table 2). As expected, participants' WTP for different types of plants was different. Compared with chrysanthemum, participants were willing to pay 77.3 cents less for tomato plants, and 87.5 cents less for basil plants. The individual random effect was highly signi cant, indicating that the correlation between the bids from the same participants was high and that the mixed linear model was the correct speci cation to capture that correlation.

Participants in each CFC subscale differed in their preference for the plant attributes (Table 2). Participants scoring high on the CFC-future subscale (column labeled 'CFC-Future-Higher') were willing to pay a premium for plants grown in a sustainable manner (16.7 cents), and for plants grown with energy-saving production methods (16.5 cents), but results were not signi cant for the water-saving attribute, thus partially supporting hypothesis 1. Those scoring low on the CFC-future subscale (column labeled 'CFC-Future-Lower') were willing to pay a premium for energy- and water-saving plants (14.3 and 15.7 cents, respectively). In contrast, results based on the CFC-immediate subscale showed that the

Table 2. Linear mixed model estimation results of the two CFC clusters (CFC-Immediate and CFC-Future)[z].

Variables	Base Model		CFC-Immediate-Higher		CFC-Immediate-Lower		CFC-Future-Higher		CFC-Future-Lower	
	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value
Production methods										
Sustainable	0.119	0.027	0.154	0.132	0.096	0.106	0.167	0.028	0.056	0.443
Energy-saving	0.156	0.004	0.188	0.064	0.135	0.123	0.165	0.029	0.143	0.051
Water-saving	0.136	0.011	0.200	0.048	0.096	0.106	0.120	0.113	0.157	0.032
Container types										
Compostable	0.147	0.006	0.211	0.039	0.104	0.078	0.182	0.017	0.100	0.174
Plantable	0.139	0.010	0.181	0.074	0.113	0.057	0.143	0.059	0.135	0.067
Recyclable	0.048	0.373	0.068	0.504	0.035	0.552	0.036	0.639	0.064	0.383
Origin of production										
Local	0.126	0.007	0.171	0.054	0.004	0.056	0.153	0.020	0.091	0.153
Imported	–0.352	0.000	–0.096	0.345	–0.112	0.000	–0.378	0.000	–0.316	0.000
Plant alternatives										
Tomato	–0.773	0.000	–1.060	0.000	–0.593	0.000	–0.551	0.000	–1.063	0.000
Basil	–0.875	0.000	–1.083	0.000	–0.744	0.000	–0.649	0.000	–1.170	0.000
Demographics										
Age	–0.008	0.439	–0.011	0.618	0.001	0.944	–0.012	0.470	–0.008	0.559
Edu low	–0.158	0.663	–0.259	0.762	–0.069	0.855	–0.010	0.986	–0.384	0.581
Edu medium	0.084	0.811	0.130	0.871	–0.024	0.946	0.148	0.759	–0.064	0.933
Income	–0.051	0.392	0.001	0.995	–0.030	0.637	–0.060	0.505	–0.039	0.617
Caucasian	0.222	0.566	0.921	0.216	–0.432	0.343	0.524	0.414	–0.247	0.599
Gender (female)	0.056	0.837	–0.410	0.462	0.490	0.120	0.007	0.986	0.291	0.415
Household size	–0.024	0.862	–0.058	0.817	–0.165	0.346	–0.189	0.413	0.155	0.348
Children	0.189	0.252	0.532	0.165	0.089	0.598	0.206	0.443	0.082	0.676
Metro	0.343	0.225	–0.111	0.876	0.374	0.196	0.223	0.613	0.594	0.112
Statistics										
Intercept	2.495	0.001	2.294	0.082	2.563	0.005	2.718	0.030	2.602	0.001
Indiv. random effect	1.442		1.763		1.217		1.707		1.092	
N	2428		940		1488		1375		1053	
Log–Likelihood	–3592.28		–1544.13		–1983.06		–2126.11		–1440.90	
Wald ×2	502.5		195.87		377.86		184.45		418.69	
Prob > ×2	0.001		0.001		0.001		0.001		0.001	
AIC	7228.562		3132.27		4010.13		4296.23		2925.802	
BIC	7356.048		3238.88		4126.84		4411.2		3034.909	

[z]Coef cients represent willingness to pay (WTP) in U.S. dollars. Akaike information criterion (AIC) and Bayes information criterion (BIC) are listed.

respondents were willing to pay a premium for only the water-saving attribute (0.20 cents), thus partially supporting hypothesis 2 (column labeled 'CFC-Immediate-Higher'). The coef cients for those low on the CFC-immediate subscale were not signi cant for production methods related attributes (column labeled 'CFC-Immediate-Lower').

The participants included in the CFC-future model were also willing to pay a price premium for plants offered in compostable (18.2 cents) and plantable (14.3 cents) containers, but not for recyclable containers (column labeled 'CFC-Future-Higher') (Table 2). Therefore, hypothesis 3 that individuals scoring high on the CFC-future subscale would be willing to pay price premiums for non-conventional containers is partially supported. The results based on the CFC-immediate model showed that the participants were willing to pay premium for only compostable containers (column labeled 'CFC-Immediate-Higher'). Because one out of three coef cients was still signi cant, this result partially supports hypothesis 4 that individuals scoring high on the CFC-immediate subscale would not be willing to pay price premiums for non-conventional containers. WTP estimates for individuals low on the CFC-immediate subscale were not signi cant.

According to the base model, the participants were willing to pay a price premium of 12.6 cents for locally-grown compared with domestic (i.e., grown in the U.S., but not local) plants (column labeled 'Base Model') (Table 2). However, further analysis by differentiating between CFC-future and immediate orientations showed that the WTP behavior is attributable to individuals scoring high on the CFC-future subscale, as opposed to scoring high on the total CFC scale. In other words, individuals scoring high on CFC-future subscale were willing to pay a 15.3 cents premium for locally-grown plants, compared with domestic (but not local) plants (column labeled 'CFC-Future-Higher'), whereas the WTP of individuals scoring high on the CFC-immediate subscale was not signi cantly different from the base alternative (column labeled 'CFC-Immediate-Higher'). Likewise, the participants scoring high on the CFC-future subscale signi cantly discounted the amount they were willing to pay for imported plants, compared with domestic, non-local plants. In other words, they expected discounts of 37.8 for imported plants compared with domestic (non-local), which is higher than the discount indicated in the base model (35.2 cents), thus supporting hypothesis 5 that individuals scoring high on the CFC-future subscale would be willing to pay

price premiums for locally produced plants (column labeled 'CFC-Future-Higher). The WTP coef cient for individuals scoring high on the CFC-immediate subscale was not signi cant (column labeled 'CFC-Immediate-Higher). Thus, the results support hypothesis 6 that the participants scoring high on the CFC-immediate scale would not be willing to pay premium for locally produced plants. The WTP coef- cients of individuals scoring low on the CFC-immediate subscale was signi cant, but much lower (11.2 cents) than that of the CFC-future subscale estimates (column labeled 'CFC-Immediate-Lower').

Consideration of future consequences. A con ict between the immediate and future consequences of individual choice behavior is involved in many daily decisions, such as recycling, saving, exercising, dieting, or smoking (Joireman et al. 2006). In addition to time discounting, commonly used in discounted utility models of intertemporal choice, there are a number of other mechanisms that play important roles in choice decisions involving intertemporal tradeoffs, including anticipation, self-control, and representation (Berns et al. 2007). Consideration of future consequences is one such theoretically relevant construct that helps to examine how the importance that individuals assign to the immediate vs. distant outcomes relates to choice decisions that involve product attributes that can result in short- and long-term impacts or consequences (e.g., plants grown using sustainable, energy- and water-saving production methods, recyclable/ compostable containers, etc.). Previous research investigating temporal constructs has linked CFC to a number of environmental intentions and behaviors. For example, those scoring high (as opposed to low) in CFC express higher levels of recycling (Ebreo and Vining 2001; Lindsay and Strathman 1997; Strathman et al. 1994), they also cooperate in resource dilemmas (Kortenkamp and Moore 2006; Joireman et al. 2009), and prefer public transportation (Collins and Chambers 2005; Joireman et al. 2004) (cf. Milfont and Gouveia 2006).

Marketing implications. Understanding the extent to which the consumers assign importance to immediate vs. future consequences provides horticultural marketers with an opportunity to effectively position products that provide long- or short-term bene ts. Individuals with the future orientation can be targeted by communicating and emphasizing product attributes that provide health or well-being bene ts in the long run. Industry groups such as Lifestyle of Health and Sustainability (www.lohas.com) strive to educate the public about healthy and sustainable lifestyle, focusing on personal health, green buildings, eco-tourism, and alternative energy, to name a few. Results in our study may contribute to sustainable lifestyle promotion efforts by informing about temporal mechanisms (considerations of immediate vs. distant bene ts) that in uence individuals' incentives and willingness to engage in proenvironmental activities (e.g., purchase energy- or water-saving products).

Although relatively little WTP differential was identi- ed in this study (i.e. WTP estimates are relatively small amounts), perhaps greater communication of the product attributes would help to stimulate demand of products sold with those attributes. Because plants are highly discretionary goods, consumers are highly sensitive to price variations. Therefore, even small WTP differentials may have far-reaching implications for effective marketing of edible and ornamental plants. In addition to WTP for plant attributes, future research could focus on the relationship between the CFC orientations and WTP for bene ts such as increased productivity, concentration and memory, reduced stress, and other therapeutic effects of plants (Hall and Dickson 2011), and how these bene ts can be emphasized to attract consumers depending on individuals' future vs. immediate orientations.

Consumer groups can be more effectively targeted by commercial rms producing eco-friendly products if they are distinctly different with identi able demographic characteristics. Findings in the present study may help in targeting consumers based on the importance they assigned (in terms of WTP) to plant attributes that are related to energy or water conservation. Previous literature has emphasized the effects of information or message framing on consumer choice for characteristics such as genetically engineered foods (Markosyan et al. 2009; Li et al. 2004; Lusk et al. 2004b; Hu et al. 2006). However, the effects of immediate vs. distant considerations has been overlooked in the consumer marketing literature. This study contributes to the consumer marketing research by integrating the effects of temporal mechanisms in individual decision-making such as consideration of future consequences in the choice decision-making models.

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