Incorporating Eye Tracking Technology and Conjoint Analysis to Better Understand the Green Industry Consumer[1]

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Abstract

Plants are often merchandised with minimal packaging, thus, consumers have only the plant itself (intrinsic cue) or information signs (extrinsic cues) on which to assess product and on which to base their purchase decision. Our objective was to explore consumers' preference for select plant display attributes and compare how consumers visually looked at the attributes. Using conjoint analysis we identified three distinct consumer segments: plant oriented (73%), production method oriented (11%), and price oriented (16%) consumers. Utilizing eye tracking technology we show that subjects spent more visual attention on cues in the retail displays that were relatively more important to them. For instance, plant oriented consumers were the fastest to fixate on the plants and looked at the plants for longer amounts of time compared to the other segments. Production method oriented consumers looked at the production labeling for a longer duration, while the price oriented consumer looked at the price sign the longest. Findings suggest that retailers should carefully consider the type of information included on signs and the relative importance those terms may have to a variety of consumers.

Introduction

Cue utilization is the cognitive process of gathering information from the external environment and using it to make a decision (Olson 1978). There are many cues available in the shopping environment which the consumer could use to make product assessments or a purchase decision, including signs and the merchandise itself. Olson (1972) categorized cues as either intrinsic (e.g. product ingredients or the product itself) or extrinsic (e.g. price, brand, package, etc.). He also posited a two-step cue assessment theory in which consumers first identify important cues before using them in judgments. Decades of consumer research has documented the persistent impact that price has on product perceptions (Gabor and Granger 1961; Dodds, Monroe, and Grewal 1991; Rao 2005; Janakiraman, Meyer, and Morales 2006; Vanhuele, Laurent, and Dreze 2006). Other extrinsic cues such as brand (Allison and Uhl 1962; Richardson, Dick and Jain 1994) and packaging (McDaniel and Baker 1977; Koutsimanis 2012) are often also assessed when consumers make product choices.

With respect to plant purchasing, plant quality is nearly always identified as an important purchase factor to consumers (Hudson et al. 1997; Behe and Barton 2000; Klingeman et al. 2004). Since plants are sold with very little packaging and often do not have brand names, consumers mainly use intrinsic cues (the plant themselves) and extrinsic cues (tags or signs) in the purchase decision. Understanding which consumers use which cues can help retailers improve the shopping process, which may lead to greater customer satisfaction and improved sales for retailers, wholesalers, and producers.

In order to better understand the role of intrinsic and extrinsic cues researchers have typically relied on various techniques, such as focus groups and experiments. As technology has evolved, researchers have been afforded new techniques to examine drivers of purchase. New technologies, such as eye tracking (ETT), allow researchers to “see exactly what the consumer sees,” thereby allowing for a better understanding of the consumer mindset. However, the literature utilizing ETT on retail plant displays, and retail displays in general, is quite sparse. Given this void in the literature and the potential impact on the green industry (e.g. greenhouse, nursery, and floriculture sales), we investigated what captures attention in retail displays to better understand cue utilization using ETT. Our objective was to investigate the use of intrinsic cues (plants) and extrinsic cues (signs) in retail plant displays with ETT. Utilizing conjoint analysis in conjunction with ETT, we gain a better understanding of how consumers view cues during the purchase decision. Similar to Hall et al. (2010) and Behe et al. (2013), we find that there are consumer segments within the plant market. We also find through ETT that not only does each consumer segment find the cue most important to them faster than the other segments, but they look at it longer.

Literature Review

Conjoint analysis

Conjoint analysis, and other experimental methodologies, has routinely been used to understand the purchase drivers of various products. Conjoint studies have been used as a means to elicit consumer preferences for a wide range of ornamental products, such as Christmas trees (Behe et al. 2005b), landscapes (Behe et al. 2005a; Zagaden, Behe, and Gough 2008), plant containers (Hall et al. 2010), and mixed flowering annual containers (Mason et al. 2008). In regard to plants, Hall et al. (2010) found that 13% of study participants valued an extrinsic cue, carbon footprint label, more than other product cues, such as price, plant container type, and waste composition in the container. Building on that study, Behe et al. (2013b) used a conjoint design to identify nine consumer segments, focusing on their gardening purchases, and documented differences in consumer preferences for plant provenance and environmental attributes of transplants.

Eye Tracking

Techniques such as conjoint analysis are invaluable to understanding the consumer mindset. However, new technologies, such as ETT, can be applied in conjunction with experimental techniques to gain a more in-depth understanding of how and why consumers make decisions. Wedel and Pieters (2008b) reported that, “The areas in the visual brain are highly specialized to process information collected during eye fixations and continuously interact with areas that direct eye movement to salient and/or informative locations in visual scenes and stimuli, which enables purposeful and goal-directed eye movement” (p.13-14). In other words, people don’t look randomly and the subconscious movement of the eye is guided by the type of information sought and its value to the task at hand. The bulk of the peer-reviewed studies using ETT investigated the process of reading by following eye-movements (see Rayner 1998, for a 20-year review of this subject). In consumer research, the peer-reviewed studies are sparse (Wedel and Pieters (2008a) for a comprehensive consumer research review).

Print advertisements have been the subject of several ETT investigations. Eye tracking was used to show that branded products receive more viewer attention compared to unbranded products, regardless of product size (Teixeira, Wedel, and Pieters 2010). Meissner and Decker (2010) demonstrated that consumers spent more time (fixations) viewing product attributes that were more important to them. Kuisma et al. (2010) found that animation in online advertisements drew the viewer’s attention more for vertical advertisements compared to horizontal advertisements. Patalano, Juhasz, and Dicke (2009) documented that consumer indecisiveness was positively related to time spent viewing information about the purchase as well as time spent looking away from information directly related to that choice task. In the marketing area, two eye tracking studies have focused on various aspects of package labels. For example, Bix et al. (2009) investigated the prominence of package warnings on OTC medicines and showed they were not readily viewed. Sorensen, Clement, and Gabrielsen (2012) showed that a product name on a label attracted six times more attention than any organic production claim, while illustrations captured more attention than health claims, even if the illustration was irrelevant.

Methodology

Experiment design

During the summer 2012, 331 consumers participated in an on-site survey to better understand the drivers of plant purchasing. As noted above, the survey consisted of a conjoint section with simultaneous ETT, which was followed by questions relating to plant purchase behaviors and demographics. The conjoint methodology used allowed consumers to evaluate a single retail garden display at a time. More refined estimates, especially for price premiums, can be obtained using choice based conjoint, however, in a retail garden center consumers generally do not look at multiple displays at once given their size. Further, price premiums were not being identified which eliminates much of the gain, if any, provided by choice based conjoint.

The identification of the attributes and levels to be included in the survey are of critical importance. Utilizing the results of previous studies, notably Hall et al. (2010) and Behe et al. (2013b), and consultations with industry, we developed a conjoint experimental design consisting of a variety of intrinsic (plant types) and extrinsic (price and production practice) attributes.

The plant type attribute was made up of three levels, mixed herbs, assorted vegetable plants, and petunias. The plant types were shown in 16cm containers and were selected to represent transplants that were (a) food-producing, (b) edible, and (c) ornamental in nature. The price attribute consisted of three prices, including $1.99, $2.49, and $2.99/plant. This range of prices was chosen after examination of prices at various garden centers in the cities used as venues for this research. Given the increasing popularity of environmental friendliness, three environmental production practice labels, “grown using water-saving practices”, “grown using energy-saving practices, and “grown using sustainable practices”, were used in order to compare to the “grown using conventional practices” label.

The combination of attributes and levels represented a 3 (plant types) x 4 (production practices) x 3 (prices) design. By using a fractional factorial design the minimum number of stimuli needed was 16 profiles. Each profile consisted of a picture of a retail plant display. Researchers met at a greenhouse garden center in Dallas, TX in spring 2012 to construct the displays. Using the display at the garden center and researchers experience, a representative retail display was constructed that consisted of a display of the desired plant type with three blank signs in the display. After taking pictures of the needed profiles, researchers used Adobe Photoshop to digitally add the prices and production practices onto the blank signs. The center sign always indicated the type of plants in the display (e.g. “assorted fresh herb plants,” “annual petunias assorted colors” or “vegetable plants”) given this is customary in most retail plant displays. The left sign always indicated the production practice, while the right sign always indicated the price per 16cm plant in the display. We did not rotate the price and production practice label locations given this increased the number of profiles needed to an unmanageable number. From each profile, the same pictures for herbs, petunias and vegetables was used, insuring no outside variation was introduced into the design. Furthermore, the sign text was added in the same font size and style across all signs and profiles.

Subjects were recruited to the study by various means (Craig's List, newspaper advertisements, and flyers posted proximate to the study locations) in six North American university or research center venues including Apopka, FL; College Station, TX; West Lafayette, IN; East Lansing, MI, St. Paul, MN, and Vineland Station, Ontario, Canada. The number of panelists per location ranged from 48 to 67. Each panelist was given a $25 incentive for participating in the survey. After being informed about the study purpose and signing an IRB approved informed consent form, subjects completed the demographic portion of the survey questionnaire. They were subsequently seated at the Tobii X1 Light ETT and were oriented with and calibrated to the equipment (Behe, 2013a). The Tobii X1 Light ETT allows researchers to track eye movement across a computer screen whereby the ETT device hooks to the bottom of the screen and bounces infrared beams of light off the eye and captures the position the eye is fixating on the screen area at the millisecond level

During orientation and calibration, participants were encouraged to sit as still as possible while viewing the displays on a computer screen. The visual data collection began with the subject viewing a sample display to become familiar with the study protocol. After being familiarized with the survey protocol, participants were asked to verbally indicate how likely they were to purchase a plant within the display using a 10-point Likert scale where 1 = not at all likely to buy and 10 = very likely to buy. After the participant called out their rating, a researcher recorded the verbal response as a colleague advanced the screen to the next profile. In order to minimize order bias, the profile presentation was randomized between survey locations. Furthermore, the same laptop and computer screen was used at each location in order to insure the image quality and size were the same between locations. After viewing the 16 images, subjects completed supplemental questions with regard to the past plant purchases and other attitudinal and behavioral questions.

Tobii Studio-3.0.2.218 (Tobii) provided the basis to compiling the visual metric calculations and areas of interest (AOIs). An AOI is a section of the image that the researcher chooses to analyze in greater detail. For this study, four AOI's were created, one AOI for each sign and one for the plant display (not including the signs). Close fitting AOI's were drawn using the Tobii rectangle tool for the signs and the polygon tool for the foliage. The AOI's were drawn to fit each image closely (Figure 2). To maintain consistency in AOI size and position between the 16 profiles, the AOI drawings were copied and pasted in place over each similar image in the test. After defining the AOI's for profiles, the four metrics, time to first fixation (TFF), first fixation duration (FFD), total visit duration (TVD) (all measured in milliseconds) and fixation count (FC) on each AOI were calculated by the Tobii Studio Statistics tool.

TFF is a measure of how many milliseconds it took a participant to first fixate on a particular AOI. A lower TFF implies the AOI commands attention. FFD is the length of time in milliseconds that the participant fixated on an AOI during the first fixation. TVD is the total time in milliseconds that the participant looked at a particular AOI. The FC is the number of times the participant fixated on an AOI. The output table of the participant values was exported to a .txt file which was opened in Microsoft Excel 2007 and transformed from multiple columns per metric to a manageable single column per metric.

Hypotheses

Consistent with Hall et al. (2010) and Behe et al. (2012), we hypothesize (H_1) that the plant market is heterogeneous with distinct market segments. Further, we hypothesize that the cues which are more important to a consumer will be visually found before less important cues (H_2). For instance, a price sensitive consumer will find the price sign faster than a consumer that is not price sensitive ($TFF_{Price\ Sensitive} < TFF_{Not\ Price\ Sensitive}$). We further hypothesize that consumer important cues will also generate longer FFD, TVD, and FC compared to less important cues (H_3). Taking the price sensitive consumer as an example we expect that the price sign will see $FFD_{Price\ Sensitive} > FFD_{Not\ Price\ Sensitive}$, $TVD_{Price\ Sensitive} > TVD_{Not\ Price\ Sensitive}$, and $FC_{Price\ Sensitive} > FC_{Not\ Price\ Sensitive}$. In comparison across AOI's, we anticipate that the plant area AOI will see a faster TFF, TVD, FFD, and FC across all consumers segments (H_4) given it is larger than the other AOI's (typical in retail displays) and any of the three equally and arguably the most visually interesting (Figure1).

Further, Ataly, Bodur, and Raslofoarison (2012) demonstrated that the visual gaze would be more often central, regardless of horizontal or vertical presentation of products. Given the central nature of the plant type sign, we hypothesized that the plant type sign would have a lower TFF among the three signs. Lenzner, Kaczmirek, and Galesic (2011) showed that some study participants fixated longer when exposed to vague or imprecise terms, complex syntax, and low frequency words or phrases. Since production method might contain unfamiliar or ambiguous terms (e.g. sustainable, see Campbell et al. 2013), we hypothesized that the production method sign would have the longest TFF, FFD, and TVD across signage (H_5).

Analyses

Numerous techniques such as probit, logit and tobit have been utilized to analyze conjoint designs. However, given our desire to obtain individual level estimates in order to obtain consumer segments, we utilized ordinary least squares (OLS) to construct individualized models for each participant. A part-worth utility framework was used whereby the dependent variable for each model was the Likert rating with the independent variable being the attribute level combination presented in the profiles. Therefore, the model was

$$RT_{ji} = \sum_{i=1}^{16} \beta_j X_{ji} + \varepsilon_i \qquad [1]$$

where RT represents the Likert rating of the j^{th} product by the i^{th} participant, X represents the j^{th} product profile seen by the i^{th} participant and β is a vector of part-worth utility coefficients. Similar preferences (i.e. part-worth utilities) can be then grouped together to form clusters or consumer segments (Green and Helsen 1989). Consumer segments should be market segments should be measureable, accessible, substantial, differentiable, and actionable (Kotler and Armstrong 2001). Following Behe et al. (2013) we utilized a combination of objective and subjective criterion to identify the optimum number of segments. Utilizing Ward's Linkage and Weighted Average Linkage algorithms in combination with the pseudo-f (Calinski and Harabasz, 1974) and pseudo-j (Calinski and Harabasz, 1974) "stopping rules" to objectively identify the optimum number of segments. After identifying the objective optimum, we examined the segments around the optimum to analyze if segments meeting the Kotler and Armstrong (2001) criteria existed. After the objective and subjective tests were completed, three consumer segments ("plant oriented," "production practice oriented," and "price oriented") were identified.

After identifying the number of segments a multinomial logit model (ML) was used to identify any differences in demographics or purchasing behaviors that might increase the probability of being a member of a certain segment. The ML specification was as follows (Green p. 721),

$$Prob(S_i = j) = \frac{e^{j'\beta k_i}}{\sum_{k=1}^{3} e^{\beta'_k x_i}} \quad \text{where j = 1, 2, 3} \qquad [2]$$

where *Prob*(S_i = j) is the probability participant i was in segment j, k_i is a set of demographic and purchasing behavior variables, and β_j is a vector of parameters estimates. Along with identifying which demographics and purchasing behaviors increase the probability of segment membership we also used a Kolmogorov Smirnov test to determine if differences existed between TFF, FFD, TVD, and FC across each consumer segment for each sign (e.g. for price sign was $TFF_{Price\ Oriented} < TFF_{Plant\ Oriented}$).

Results

The average R-square across all individual OLS models was 0.76, implying good fit for the models. For the conjoint results, on average, respondents placed half of the relative importance (RI on plant type (50%), 27% on production methods, and 23% on price. RI can be defined as the amount of importance an attribute contributes to the overall purchase decision (Hair et al. 1998). This was consistent with other findings where, on average, study participants ranked the RI of the plants highest (Hall et al., 2010 and Behe et al, 2013b). We did find diversity in RI among the 331 participants, supporting H_1. Utilizing the clustering procedure described above, we found three market segments: 73% were categorized as plant oriented 10% as production method oriented, and 16% were classified as price oriented (Table 1). Members of the plant oriented segment placed 7% more RI on plants compared to the sample in total. Members of the production methods segment placed 18% less RI on merchandise, falling second to production method. For members of the price conscious segment, RI of merchandise dropped 20% to second place whereas the RI of price increased 22% and ranked first.

In examining the part-worth utilities (PW) in Table 1, we observed that the moderately priced product ($2.49) was preferred over both lower and higher priced products, inconsistent with prior studies where lower prices were preferred. However, research has shown that consumers who are highly involved in a product category place less emphasis on the price cue than consumers who are less involved in the product category (Zaichkowsky, 1988). We may hypothesize in future studies that price may reflect quality for those who are more highly involved. While involvement was not measured in this study, it merits inclusion in future investigations.

Plants with “conventional” production were substantially discounted (-0.21). Modest changes in preference ranging from 0.04 to 0.09 were attributed to the non-conventional production practices. The greatest increase was for water-saving production practices (0.09), which was not consistent with the findings of Behe et al. (2013b) where energy-saving production practices were preferred.

However, part-worth utilities varied by segment as did RI. Looking at the production method oriented segment first, we see that conventional production method was the least preferred (-1.26), while substantial preference was placed on sustainable (5x), water-saving (7x), and energy-saving (7x) which was more consistent with prior findings (Behe et al. 2013b). For the plant oriented segment we see that 57% of the purchase decision was based on plant type with little to no preference for production practice. The price oriented segment preferred the middle price ($2.49) with only small preference for the “environmentally friendly” production practices.

Demographically and behaviorally, the three segments differed on a few parameters (Table 2). Utilizing the marginal effects, we see that production method oriented consumers were slightly less likely to have been from Indiana compared to those consumers from Ontario. For each additional adult in the household above the average implies a 5.1% increase in the probability of being in the plant oriented segment, while resulting in a 4.4% decrease in the probability of being in the production method segment. Plant oriented consumers were 9% more likely to live in rural areas while production method oriented consumers were 3% less likely to live in a rual area compared to an urban area. Price oriented consumers were slightly less likely to have spent a higher percentage of their food budget on organic products. Not surprisingly, plant oriented consumers were 8% more likely to have a lawn but slightly less likely to have purchased a higher percentage of local plants. Also surprisingly, price oriented consumers were slightly more likely to have bought a higher percentage of their plants purchased locally. Production method oriented consumers were slightly more likely to have spent a higher amount on garden supplies and plants in the six months prior to the study and to have purchased plants from a mass-merchandiser.

Visual Data Analysis

Time to first fixation (TTF) is a metric indicating the element in the image that first captured attention, so lower times indicate an element that commanded attention quickly. Because the plant identification sign was centrally located on every image, it should have had the shortest TTF, consistent with the central gaze theory. Among the three signs, it did have the lowest mean TTF, but the time differed among the three segments (Table 3). In fact, the plant identification sign had a shorter TTF for the plant oriented group compared to the other groups. For the plant oriented segment, TTF was fastest for plant and lower compared to TTF on the plants for production and price oriented consumers, supporting H_2. For production method oriented consumers, TTF was fastest on the production sign, not on the plants or the central identification sign, not supporting H_2. Also for the price oriented segment, TTF was fastest for production method sign, not supporting H_2. However, this group may have been drawn to this sign because it contained unfamiliar, irrelevant, or confusing information, consistent with Lenzner, Kaczmirek, and Galesic (2011).

FFD is an indication of the time used to process the information in the first fixation (Table 4). The plant oriented segment had the longest FFD on the plants compared to the other two segments, 0.04 and 0.02 for production method and price oriented, respectively. This finding supports H_3. However, all three segments spent the lowest FFD on the plants which does not support H_4. The FFD on the plant identification sign (located centrally on all images) had similarly long and the second shortest FFD among all three segments. The price sign had the third longest FFD for all three groups and was equally long across them. The FFD for the production sign was longest for all three groups. However, for the price oriented group, FFD was 2 ms shorter than for the production method oriented segment which was 1 ms shorter than for the plant oriented segment. Thus, H_3 was partially supported in that FFD on price was shorter than FFD on production method sign, but FFD on plants was not shorter than FFD on the plant identification sign.

TVD is an indirect measure of cognitive processing in that it is a product of FC x fixation duration per visit. Table 5 shows the TVD for each of the four AOIs by segment. When comparing the TVD on each of the three signs, we see that the TVD on the central sign (plant identification) was lower than the production method sign for all three segments, also supporting H_4. Members of all three segments had the highest TVD on the plants, supporting H_4. However, in comparing the mean TVD by segment, we see that the plant oriented segment had a longer TVD on the plants compared to the other two segments. The production method oriented segment had a longer mean TVD on the production method sign compared to the other two groups. We also observed that the price oriented consumers had a longer TVD on the price sign compared to the other segments. Further, we see that the production sign does have the highest TVD across all signage for each market segment. From these results for TVD we find that H_3

and H_5 are supported. Given our findings support H_3, consumers look at the cues that they value, it is more important than ever for Green Industry firms to be aware of the signage they use in their display. Further, since our results also support H_5, that production signage has a higher TVD compared to other signs, firms should be aware that production signs will take away time from other signage regardless of whether the consumer values the production practice. Thereby, retailers wanting to focus less on production should use clear and concise terminology so that consumers will fixate less on the production practice and more on other signage (or product) that the firm wants to emphasize.

Conclusions

Markets are not homogeneous, thus it is not surprising that the consumers who comprise those markets are heterogeneous in their preferences and the relative importance on which they place different product cues. This study is one of the first efforts to document the relationship between the stated preference for products in a retail display and visual data collected with ETT. There are many cues available in the shopping environment, including signs and the merchandise itself, which the consumer could use to make a purchase decision. We saw that plant oriented consumers utilized the intrinsic cue (the plant itself) over other extrinsic cues (signs), consistent with Olson's (1972) two-step cue assessment theory in which consumers first identify important cues before using them in judgments. Overall, our data revealed congruency between cue preference and attention measures. For example, the plant oriented segment fixed their gaze most quickly (TTFF) on the preferred intrinsic cue (plant itself), while the production oriented segment's TTFF was fastest for the production sign. Understanding consumer cue preferences can assist retailers in providing display cues that grab consumer attention.

Decades of consumer research has documented the persistent impact that price has on product perceptions. Price is a relatively common and simple (5 characters, in this case) message to convey. Yet, we observed that the price oriented consumers had a longer TVD on the price sign compared to the other segments. This indicates they were thinking about price longer than individuals in other segments and longer than other extrinsic cues. Given the central gaze theory, the first fixation for all participants should have been on the plant identification sign. For production method oriented consumers, TTFF was lowest on the production sign, not on the plants or the central identification sign. This cue was high in RI in their stated cue preference as well as commanding their visual attention. When we analyze our findings in total, they parallel previous empirical work (Meissner & Decker, 2010) in that consumers spend more time fixating on important cues.

This study provides some of the first objective visual data which relates stated preference to eye movement. Results showed that consumers identified and considered information consistent with their stated preference, supporting Olson's (1972) theory. Findings suggest that retailers should consider information included on signs and the relative importance those terms may have to a variety of consumers. A fruitful area for future study will be to investigate the relationship between relative importance of product cues and measures of attention to actual purchase behavior. This line of research is made feasible with the use of eye tracking glasses at the point of purchase. While eye tracking technology can provide insights into what grabs consumer attention, these data need to be combined with other measures (e.g. product involvement, price sensitivity) to assist in understanding the why certain product cues are relevant.

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Table 1. Conjoint analysis results for the total sample and by segment.

	Total	Plant oriented	Production method oriented [a]		Price oriented [a]	
Number	330	242	34		54	
Market share		73%	11%		16%	
Relative Importance						
Price	23%	19%	15%		45%	***
Production	27%	24%	53%	***	24%	
Plant type	50%	57%	32%	***	30%	***
Part-worth utilities						
Intercept	6.61	6.54	6.93		6.71	
Price						
1.99	-0.12	-0.15	0.10	***	-0.16	
2.49	0.30	0.17	0.17		1.00	***
2.99	-0.18	-0.02	-0.26	***	-0.84	***
Production label						
Conventional	-0.21	-0.06	-1.26	***	-0.22	**
Sustainable	0.04	0.00	0.29	***	0.07	
Energy-saving	0.07	0.01	0.52	***	0.06	
Water-saving	0.09	0.04	0.45	***	0.09	
Plant type						
Herb	0.05	0.04	0.38		-0.04	
Vegetable	-0.10	-0.13	-0.24		0.08	
Annual	0.05	0.09	-0.14		-0.04	
R squared	0.76	0.77	0.78		0.73	
Adj. R squared	0.73	0.74	0.75		0.69	

[a] T-tests were used to compare the relative importance and part-worth utilities associated the production and price segments to the main segment.

*, **, and *** represent significant differences at the 0.1, 0.05, and 0.01 levels.

Table 2. Marginal effects for each segment from the multinomial logit model.

Variables [a]	Plant oriented Coeff.	Plant oriented p-value	Production method oriented Coeff.	Production method oriented p-value	Price oriented Coeff.	Price oriented p-value
State/province						
Florida	-0.0353	0.703	0.0081	0.756	0.0272	0.760
Texas	-0.0407	0.677	-0.0246	0.163	0.0653	0.498
Minnesota	-0.1508	0.183	0.0546	0.345	0.0962	0.366
Michigan	-0.0637	0.538	-0.0152	0.512	0.0789	0.444
Indiana	0.0595	0.501	**-0.0366**	0.067	-0.0229	0.791
Age	0.0004	0.841	0.0010	0.175	-0.0013	0.437
Gender: male	0.0634	0.164	-0.0136	0.371	-0.0498	0.253
Number of adults	**0.0505**	0.088	**-0.0437**	0.019	-0.0068	0.785
Number of children	-0.0309	0.184	0.0120	0.125	0.0189	0.388
Ethnicity: Caucasian	-0.0699	0.247	0.0265	0.143	0.0434	0.453
Education						
2 year college	-0.1450	0.179	0.0345	0.357	0.1106	0.299
Bachelor's degree	-0.0857	0.410	0.0043	0.880	0.0814	0.422
Higher than bachelor's	-0.1784	0.137	0.0591	0.246	0.1192	0.306
Area						
Metro	0.0318	0.582	-0.0192	0.210	-0.0126	0.821
Rural	**0.0934**	0.054	**-0.0342**	0.039	-0.0592	0.200
Income	0.0000	0.992	0.0000	0.869	0.0000	0.947
% food budget spent on organic fresh produce	0.0035	0.047	0.0003	0.410	**-0.0037**	0.034
Have a lawn (1 = no)	**0.0885**	0.100	-0.0096	0.642	-0.0790	0.104
Dollars spent on garden supplies and plants, last 6 months	-0.0003	0.214	**0.0002**	0.072	0.0001	0.571
% of plant purchases are locally produced	**-0.0015**	0.079	-0.0001	0.671	**0.0016**	0.049
Location of purchases [b]						
Independent garden center	0.0413	0.494	0.0049	0.783	-0.0462	0.424
Home improvement or hardware store	-0.0205	0.691	0.0048	0.771	0.0157	0.750
Supermarket or grocery store	0.0556	0.200	-0.0160	0.322	-0.0396	0.327
Mass-merchandiser	-0.1107	0.115	**0.0648**	0.046	0.0459	0.472
Other	-0.0419	0.499	0.0164	0.417	0.0255	0.666
Plants purchased, last 6 months [b]						
Annual flowering	0.0763	0.187	-0.0396	0.180	-0.0367	0.475

Vegetable	0.0443	0.377	0.0213	0.270	-0.0656	0.159
Herb	-0.0194	0.683	-0.0184	0.322	0.0378	0.382
Flowering perennials	-0.0233	0.642	0.0279	0.184	-0.0046	0.920
Shrub (flowering and non-flowering)	0.0387	0.445	-0.0022	0.895	-0.0365	0.441
Tree	0.0121	0.821	-0.0119	0.437	-0.0002	0.997
Indoor flowering potted	0.0106	0.840	0.0135	0.380	-0.0241	0.635
Obs.			331			
Wald Chi2			103.18			
prob > Chi2			0.0014			
Log pseudolikelihood			-202.816			
Pseudo R2			0.19			

a Base categories include: Ontario, female, other ethnic heritage, high school diploma or less, urban, and have a lawn.

b For the location of purchase (and plants purchased) variables, the respondent could mark any of the stores (or plant types), so the base category is did not purchase from (did not purchase this type of plant).

Table 3. Time to first fixation (in seconds) by segment.

	Segment					
	Plant oriented		Production method oriented		Price oriented	
			(seconds)			
Production sign	1.23	B	0.90	A,C	1.17	B
Plant ID sign	1.15	B,C	1.27	A,C	1.35	A,B
Plant material	0.79	B,C	1.21	A,C	1.36	A,B
Price sign	1.89	B,C	2.01	A,C	1.62	A,B

Note: A pair wise Kolmogorov Smirnov test was used to test for differences between the different segments. For example, a superscript of B,C in the "Plant oriented" segment for the production sign indicates that 1.23 is significantly different at the 0.1 level or less compared to the "Production method oriented" (0.90) and "Price oriented" (1.17) segments.

Table 4. First fixation duration (in seconds) and percent of total visual time spent on first fixation by segment.

	Segment					
	Plant oriented		Production method oriented		Price oriented	
	Seconds	% time for first fixation	Seconds	% time for first fixation	Seconds	% time for first fixation
Production sign	0.40	59%	0.39 ^{C}	34%	0.37 ^{B}	38%
Plant ID sign	0.26	49%	0.25	38%	0.25	38%
Plants	0.22 ^{B,C}	9%	0.18 ^{A}	9%	0.20 ^{A}	11%
Price sign	0.34	79%	0.32	51%	0.33	37%

Note: A pair wise Kolmogorov Smirnov test was used to test for differences between the different segments. For example, a superscript of B,C in the "Plant oriented" segment for the plant area indicates that 0.22 is significantly different at the 0.1 level or less compared to the "Production method oriented" (0.18) and "Price oriented" (0.20) segments.

Table 5. Total visit duration (in seconds) by segment.

	Segment					
	Plant oriented		Production method oriented		Price oriented	
	(seconds)					
Production sign	0.68	B,C	1.16	A,C	0.97	A,B
Plant ID sign	0.53	B,C	0.67	A,C	0.66	A,B
Plants	2.36	B,C	2.11	A,C	1.77	A,B
Price sign	0.43	B,C	0.63	A,C	0.89	A,B

Note: A pair wise Kolmogorov Smirnov test was used to test for differences between the different segments. For example, a superscript of B,C in the "Plant oriented" segment for the production sign indicates that 0.68 is significantly different at the 0.1 level or less compared to the "Production method oriented" (1.16) and "Price oriented" (0.97) segments.

Figure 1. Sample display shown to 331 consumers with areas of interest imposed on the display.