

# Comparison of United States Consumers' Perceptions and Willingness to Pay for Sustainable Environmental Practices in the Retail Floral Industry Based on Geographical Regions

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**KEYWORDS.** composting, environmental attitudes, fair trade, floral design, locally sourced, organic

**ABSTRACT.** With an increase in social awareness of environmental degradation and the need to conserve resources while reducing greenhouse gas emissions, consumers have become increasingly concerned about the environmental standards of the industries from which they purchase products. This has motivated industries to restructure their business model to one that is more environmentally sustainable. Research of consumers' floral purchasing habits based on geographic regions found that these habits varied depending on the region where they lived. The main purpose of this study was to investigate US consumers' perceptions and willingness to pay as they relate to retail floral providers' environmentally sustainable practices based on the geographical region where the consumer lives within the United States. The results indicated differences in the way respondents answered questions based on the geographical region where they live. However, regardless of the US region where the respondents live, from the list of sustainable attributes covered in this study, respondents indicated the use of locally sourced flowers and composting of floral waste as the two sustainable attributes with the most perceived value to consumers. The findings of this study indicate that floral providers that have incorporated any type of sustainable attribute into their businesses should be promoting this to the public. Floral providers located in the West and Northeast regions of the United States should especially consider emphasizing sustainable attributes within their business because consumers in these regions indicated that they were most willing to pay premiums for sustainable practices. Additionally, floral providers in the West should consider sourcing and promoting the use of fair-trade materials to their customers.

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Because of the increase in social awareness of environmental degradation and the need to conserve resources while reducing greenhouse gas emissions, consumers have become increasingly concerned about the environmental standards of industries from which they purchase products (Lee et al. 2019; Ouvrard et al. 2020; Ye 2022). This has motivated industries to restructure their business model to one that is more environmentally sustainable (Ouvrard et al. 2020). Within the horticulture/floriculture industries, there has been an increase in products branded as “organic,” “sustainable,” and “fair trade” that are sold in the United States and worldwide to keep pace with more environmentally conscious consumers (Lernoud and Willer 2017; Toumi et al. 2016). These

branded products are often related to certifications that help to ensure that growing conditions meet or exceed legal government mandates and industry norms as they relate to environmental sustainability (Lernoud and Willer 2017; Raynolds 2012). One study that investigated sustainable, organic, and local certifications within the food production industry found that consumers preferred certified food products over products that had no certification and were willing to pay a premium for such products (Sackett et al. 2016). Additionally, research that investigated consumers' perceptions of sustainably sourced ornamental plants has shown that consumers are more concerned about plants being locally sourced over being organically grown because health concerns associated with the use of synthetic pesticides on plants, as opposed to food, are not as concerning to consumers (Yue et al. 2011).

A study that investigated consumers' perceptions of sustainable environmental attributes incorporated into floral providers' business models found that a majority of those surveyed were willing to pay up to 10% more for floral designs from floral providers with more environmentally sustainable practices (Etheredge et al. 2023). The same study also found that, from the environmentally sustainable attributes that respondents were asked about, the use of locally sourced flowers was the most influential change that a floral provider could make to increasing consumers' willingness to purchase. Respondents also indicated a strong willingness to pay a premium to retail floral providers that dispose of floral waste through composting (Etheredge et al. 2023). Research has indicated that the premium a consumer is willing to pay varies depending on the specific environmental attribute (Khachatryan et al. 2014). Additionally, a study that investigated consumers' environmental practices based on the types of plant purchases they make found that consumers who purchase predominantly herbaceous plants, flowering annual plants, perennial plants, indoor flowering plants, and herbs or vegetable transplants were more environmentally friendly than consumers who purchase other types of plants such as flowering shrubs and deciduous and evergreen

trees (Behe et al. 2010). It has been found that introducing environmental strategies into a company's business model can boost economic performance and enhance profitability (Brulhart et al. 2017).

Consumers tend to purchase environmentally sustainable products for reasons such as plant protection, soil-protecting production, water protection, as well as conservation of resources, greenhouse gas emission reduction, and recyclability (Isaak and Lentz 2020). Additionally, consumers' reasons for purchasing sustainable products are typically situational and issue-specific (Choi and Johnson 2019).

There is increasing evidence that environmentally sustainable practices lead to increased customer loyalty (Jayaraman et al. 2012; McCoy et al. 2021). An analysis of European consumers' purchasing preferences for flowers and plants showed that consumers valued a product's origin and prefer locally grown and seasonal flowers (Gabellini and Scaramuzzi 2022). It was also noted that sustainability and transparency play an increasingly significant role in consumer choices, especially among young educated consumers (Gabellini and Scaramuzzi 2022).

Public opinions about topics such as environmental sustainability, including climate change, have an important influence on decision-making related to policies of the government and private industries; however, American opinions vary widely depending on where people live (Marlon et al. 2021). The United States is broken down into four main regions comprising states that subdivide the country. The US regions are the West (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming), Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin), South (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia), and Northeast (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont) (US Census Bureau 2021). Research that investigated US residents' perceptions of environmental

topics such as climate change based on where they live found that residents in the Midwest were least concerned with climate change, followed by those from the South. Residents in the Northeast were the most concerned about climate change, followed by residents from the West (West: 70.6% think climate change is occurring; Midwest: 68.0% think climate change is occurring; South: 69.1% think climate change is occurring; Northeast: 74.0% think climate change is occurring) (Marlon et al. 2021). Compared to those who live in other regions, Americans who live in the western states have reported feeling more impacted by climate change because of wildfires and water shortages (Funk and Heffernon 2019).

Research that investigated consumers' floral purchasing habits based on geographic regions found that consumers' purchasing habits varied depending on the region where they lived (Yue and Behe 2008). The same study concluded that visibility of the vendor, regional weather conditions, and population density all play a role in consumers' floral purchasing habits. Because consumers' floral purchasing habits vary from region to region in the United States, retailers within a certain region should understand what marketing efforts will benefit them based on their geographic location (Yue and Behe 2008).

Fresh cut flowers are often thought of as a luxury product (Ye 2022). Luxury items are products that are desirable but not essential and are purchased mostly for enjoyment and elegance, such as branded handbags and jewelry (Lim et al. 2020). Luxury and utilitarian products with environmental claims enhance consumers' perceptions of the product, especially when the content of the claim emphasizes global environmental benefits (Steinhart et al. 2013). Environmental claims may also improve consumers' perceptions of luxury items, thus giving them justification to indulge in such products (Steinhart et al. 2013).

The main purpose of this study was to investigate US consumers' perceptions and willingness to pay as they relate to retail floral providers' sustainable and environmentally friendly practices based on the geographical region where they live.

## Materials and methods

**SAMPLE.** Exemption from institutional review board approval was obtained for this research (IRB protocol 21-211; May 2021). Respondents were drawn from an online survey that was created using Qualtrics (Provo, UT, USA) and posted for 5 weeks by the sponsors and co-sponsors of the study on their social media platforms and spread through post-sharing between 21 Dec 2022 and 27 Jan 2023. To gain a more robust sample, the researchers also contracted Momentive Inc. (San Mateo, CA, USA), which maintains a panel of more than 50 million people globally. The researchers specified within the survey consent form/summary that individuals who were targeted for the study had to be at least 18 years old and reside within the United States. Control mechanisms implemented by the contracted provider eliminated duplicate responses.

**INSTRUMENTATION.** The survey instrument consisted of 31 questions within four different sections and was assembled using past surveys that explored consumers' preferences and purchasing habits regarding floral products and views of environmental certifications and awards (Huang and Yeh 2009; Lee et al. 2019; Short et al. 2017; Yue and Behe 2008). The questions were reviewed, and feedback was given by a panel of industry experts. The expert panel consisted of eight individuals who worked in the educational, wholesale, and retail sectors of the floriculture industry. The expert panel members were selected based on their experience in the floriculture industry and their willingness to participate on the panel. Then, the questionnaire was pilot-tested to identify problems with the questionnaire's instructions and specific questions within the survey.

The first section of the survey explored participants' willingness to pay for varying environmentally sustainable business attributes. The first section included 14 questions related to respondents' perceptions of environmentally sustainable attributes and their willingness to pay a premium for products from floral providers that are more environmentally sustainable than those that are not. For the purpose of this study, retail floral providers were defined as florists, wedding/event

**Table 1. Distribution of respondents from each state in the United States and consumers' perceptions and willingness to pay for sustainable environmental practices of the retail floral industry.**

US region <sup>i</sup>	Respondents	
	(no.)	(% of total)
<b>West</b>		
Alaska	7	0.3
Arizona	64	3.0
California	257	11.8
Colorado	36	1.6
Hawaii	4	0.2
Idaho	10	0.5
Montana	2	0.1
Nevada	19	0.9
New Mexico	8	0.4
Oregon	23	1.1
Utah	21	1.0
Washington	46	2.1
Wyoming	3	0.1
<b>Regional total</b>	500	23.1
<b>Midwest</b>		
Illinois	84	3.9
Indiana	50	2.3
Iowa	13	0.6
Kansas	17	0.8
Michigan	77	3.6
Minnesota	42	1.9
Missouri	47	2.2
Nebraska	11	0.5
North Dakota	3	0.1
Ohio	97	4.5
South Dakota	4	0.2
Wisconsin	35	1.6
<b>Regional total</b>	480	22.2
<b>South</b>		
Alabama	50	2.3
Arkansas	20	0.9
Delaware	9	0.4
District of Columbia	4	0.2
Florida	144	6.7
Georgia	61	2.8
Kentucky	33	1.5
Louisiana	19	0.9
Maryland	44	2.0
Mississippi	18	0.8
North Carolina	54	2.5
Oklahoma	20	0.9
South Carolina	27	1.3
Tennessee	40	1.8
Texas	147	6.8
Virginia	57	2.6
West Virginia	13	0.7
<b>Regional total</b>	760	35.1
<b>Northeast</b>		
Connecticut	30	1.4
Maine	7	0.3
Massachusetts	36	1.7

(Continued in next column)

**Table 1. (Continued)**

US region <sup>i</sup>	Respondents	
	(no.)	(% of total)
New Hampshire	5	0.2
New Jersey	67	3.2
New York	185	8.5
Pennsylvania	89	4.1
Rhode Island	3	0.1
Vermont	2	0.1
<b>Regional total</b>	424	19.6
<b>Grand total</b>	2164	100

<sup>i</sup> US Census Bureau 2021.

planners, grocery outlets, and other consumer-facing outlets and were separate from nurseries/greenhouses. Respondents answered various types of questions, including 5-point Likert-type (Likert 1932) questions, multiple-choice questions, and ranking questions. Likert answers included “strongly disagree,” “disagree,” “neither agree nor disagree,” “agree,” and “strongly agree.” Examples of questions included, “Overall, I would be more willing to make purchases from a retail floral provider that is environmentally friendly than from a retail floral provider that is not environmentally friendly” and “All other considerations held the same, I would be more willing to make purchases from a retail floral provider that sells flowers sourced from local farmers and nurseries (farms and nurseries within 100 miles of the retail floral provider)” (Lee et al. 2019). Multiple-choice questions asked respondents to answer questions using a given set of answers. Example of multiple-choice questions included, “Please indicate how much more, if any, you would be willing to pay for a flower arrangement made using locally grown flowers (grown within 100 miles of the retail floral provider).” Examples of multiple-choice answers included “0%,” “5%,” “10%,” “15%,” “20%,” and “25% or more.”

The second section of the survey attempted to determine consumers' perceptions of green awards and certifications (Lee et al. 2019). The second section consisted of three questions (two Likert-type questions and one multiple-choice question). The same answer choices used in section one were used in section two for the respective question types. Examples of questions included, “If an environmentally friendly certification existed

for retail floral providers, I would be more willing to make purchases from a certified environmentally friendly retail floral provider than from a retail floral provider not certified” and “Please indicate how much more, if any, you would be willing to pay for flowers and floral designs from an environmentally friendly-certified retail floral provider if such a certification existed.”

The third section collected information regarding consumers' cut flower shopping habits and consisted of eight questions that asked respondents to identify the frequency at which they purchase flowers from a retail flower shop and the way they most often make purchases from a retail flower shop (online, face-to-face, or over the phone) (Huang and Yeh 2009; Yue and Behe 2008).

The last section consisted of six demographic questions that asked respondents to provide their age, education level, annual household income, sex, ethnicity, and state where they live. These were based on a reliable instrument used during a previous similar study (Short et al. 2017).

**DATA ANALYSIS.** Data from the survey were analyzed using Kendall's coefficient of concordance (Kendall's W), as well as descriptive and frequency statistics. Comparisons were also made between regions using an analysis of variance (ANOVA) and post hoc least significant difference (LSD). Data from the survey were analyzed using IBM SPSS Statistics (version 28; IBM Corp., Armonk, NY, USA).

## Results and discussion

**SURVEY RESPONSE.** A total of 2172 people responded to the survey; however, eight were excluded because they lived outside the United States or did not indicate the state where they lived, resulting in 2164 participants responses that were analyzed. Respondents to the survey were grouped within the previously mentioned US geographical regions (West: N = 500; Midwest: N = 480; South: N = 760; and Northeast: N = 424) based on the state where they lived when they completed the survey. The survey was successfully completed by respondents who lived in all 50 states and Washington, DC (Table 1).

A demographic analysis found that, overall, the respondent population for this study skewed slightly toward female participants (1223; 56.3%) and Caucasian participants (1508; 69.4%) (Table 2).

**OVERALL PERCEPTIONS ON PURCHASING FROM FLORAL PROVIDERS WITH ENVIRONMENTALLY SUSTAINABLE CHARACTERISTICS BASED ON US GEOGRAPHICAL REGIONS.** Respondents were asked to rate how environmentally correct it is to make purchases based on the floral providers' environmental practices and to rate their overall willingness to make purchases from a sustainably run floral

provider rather than from other floral providers based on a 5-point Likert scale. An ANOVA indicated there was no statistical difference in the way respondents answered the questions based on geographical regions. Frequency statistics indicated that a majority of respondents from each region agreed or strongly agreed that it was the environmentally correct choice to make purchases from retail floral providers based on their environmental practices within their business, and that they would be more willing to make purchases from floral providers that are more environmentally friendly compared with those that are not (Table 3).

**OVERALL WILLINGNESS TO PAY FOR SPECIFIC ENVIRONMENTALLY SUSTAINABLE ATTRIBUTES BASED ON GEOGRAPHICAL REGIONS.** Five questions asked respondents to indicate how willing they would be to make purchases from retail floral providers based on environmentally sustainable attributes that could be incorporated into their business models. An ANOVA indicated differences in the way participants answered the question, "All other considerations held the same, I would be more willing to make purchases from a retail floral provider that recycles their flower waste through composting than a retail floral provider that disposes of

**Table 2. Demographics of respondents from each US region and consumers' perceptions and willingness to pay for sustainable environmental practices of the retail floral industry.**

Demographics	West <sup>i,ii</sup>		Midwest		South		Northeast	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
<b>Sex</b>								
Male	227	45.4	200	41.7	302	39.7	190	44.8
Female	264	52.8	276	57.5	451	59.3	232	54.7
Nonbinary/third gender	9	1.8	4	0.8	7	0.9	2	0.5
<b>Age, years</b>								
18–24	54	10.8	40	8.3	78	10.3	35	8.3
25–34	105	21.0	57	11.9	131	17.2	57	13.4
35–44	75	15.0	96	20.0	119	15.7	77	18.2
45–54	88	17.6	86	17.9	142	18.7	90	21.2
55–64	77	15.4	106	22.1	154	20.3	95	22.4
≥65	101	20.2	95	19.8	136	17.9	70	16.5
<b>Race</b>								
White or Caucasian	290	58.0	395	82.3	510	67.1	313	73.8
Black or African American	27	5.4	26	5.4	86	11.3	25	5.9
Hispanic or Latino	69	13.8	19	4.0	70	9.2	27	6.4
Asian or Asian American	72	14.4	25	5.2	55	7.2	43	10.1
Native American or Alaskan native	11	2.2	2.0	0.4	10	1.3	4	0.9
Native Hawaiian or other Pacific islander	4	0.8	13	2.0	4	0.5	1	0.2
Another race	27	5.4	395	82.3	25	3.3	11	2.6
<b>Education</b>								
K–11	7	1.4	1	0.2	9	1.2	7	1.7
GED/high school diploma	59	11.8	71	14.8	119	15.7	63	14.9
Some college	129	25.8	108	22.5	191	25.1	73	17.2
College degree	196	39.2	172	35.8	255	33.6	158	37.3
Postgraduate degree	91	18.2	96	20.0	148	19.5	100	23.6
Associate/trade school degree	18	3.6	32	6.7	38	5.0	23	5.4
<b>Annual household income</b>								
<\$15,000	34	6.8	36	7.5	65	8.6	27	6.4
\$15,000–\$29,999	54	10.8	57	11.9	95	12.5	44	10.4
\$30,000–\$49,999	79	15.8	68	14.2	131	17.2	73	17.2
\$50,000–\$74,999	113	22.6	109	22.7	151	19.9	80	18.9
\$75,000–\$99,999	78	15.6	81	16.9	104	13.7	72	17.0
\$100,000–\$149,999	76	15.2	75	15.6	138	18.2	70	16.5
\$150,000–\$199,999	36	7.2	26	5.4	38	5.0	28	6.6
≥\$200,000	30	6.0	28	5.8	38	5.0	30	7.1

<sup>i</sup> West: N = 500; Midwest: N = 480; South: N = 760; Northeast: N = 424.

<sup>ii</sup> Refer to Table 1 for a list of states by region.

GED = general equivalency diploma.

**Table 3. Responses to seven statements using a 5-point scale (1 point = strongly agree, 2 points = agree, 3 points = neither agree nor disagree, 4 points = disagree, and 5 points = strongly disagree) indicating the willingness to purchase from floral providers based on specific environmentally sustainable attributes based on geographical locations within the United States.**

Survey statement	West <sup>i,iii</sup>				Midwest		South		Northeast		df	F	P
	Agree or strongly agree (n)	Agree or strongly agree (%)	Agree or strongly agree (n)	Agree or strongly agree (%)	Agree or strongly agree (n)	Agree or strongly agree (%)	Agree or strongly agree (n)	Agree or strongly agree (%)	Agree or strongly agree (n)	Agree or strongly agree (%)			
I think it is the environmentally right choice to make purchases from a retail floral provider based on their environmental practices.	311	62.2	280	58.4	439	57.8	239	56.4			3	2.167	0.090
Overall, I would be more willing to make purchases from a retail floral provider that is environmentally friendly than from a retail floral provider that is not environmentally friendly.	313	62.6	295	61.4	463	60.9	263	62.0			3	0.859	0.462
All other considerations held the same, I would be more willing to make purchases from a retail floral provider that recycles their flower waste through composting than a retail floral provider that disposes of floral waste in municipal landfills.	338	67.6 a <sup>iii</sup>	315	65.7 ac	464	61.0 b	270	63.7 bc			3	3.108	0.025*
All other considerations held the same, I would be more willing to make purchases from a retail floral provider that sells flowers sourced from local farmers and nurseries (farms and nurseries within 100 miles of the retail floral provider).	329	65.8	337	70.2	479	63.1	270	63.7			3	2.262	0.079

Table 3. (Continued)

Survey statement	West <sup>i,ii</sup>		Midwest		South		Northeast		F	df	P
	Agree or strongly agree (n)	Agree or strongly agree (%)	Agree or strongly agree (n)	Agree or strongly agree (%)	Agree or strongly agree (n)	Agree or strongly agree (%)	Agree or strongly agree (n)	Agree or strongly agree (%)			
All other considerations held the same, I would be more willing to make purchases from a retail floral provider that sells organically grown flowers (flowers grown and processed using no synthetic fertilizers or pesticides).	270	54.0	215	52.3	385	50.6	217	51.1	0.993	3	0.395
All other considerations held the same, I would be more willing to make purchases from a retail floral provider that sells fair-trade sourced flowers (fair-trade can be defined as trade between companies in developed countries and producers in developing countries).	290	58.0	258	53.7	404	53.2	223	52.6	1.557	3	0.198
All other considerations held the same, I would be more willing to make purchases from a retail floral provider that uses sustainable, recycled, upcycled, and/or reusable materials instead of single-use products.	319	63.8	304	63.3	434	57.1	257	60.7	1.998	3	0.112

<sup>i</sup> West: N = 500; Midwest: N = 480; South: N = 760; Northeast: N = 424.<sup>ii</sup> Refer to Table 1 for a list of states by region.<sup>iii</sup> Means followed by the same letter are not significantly different at  $P \leq 0.05$  according to the least significant differences test.\* Statistically significant at  $P \leq 0.05$ .

df = degrees of freedom.

floral waste in municipal landfills” ( $P = 0.025$ ). A post hoc (LSD) analysis indicated differences in the way respondents from the West (67.6% agree or strongly agree) and Midwest (65.7% agree or strongly agree) answered the question compared to how respondents from the South (61.0% agree or strongly agree) and Northeast (63.7% agree or strongly agree) answered. However, no difference was found between the way respondents from the Midwest and Northeast answered the question. Overall, participants from the West and Midwest indicated a stronger willingness to make purchase from floral providers that compost their floral waste compared with respondents from the South and Northeast, with those from the West being the most willing (Table 3). Respondents from all regions indicated the use of locally sourced flowers, followed closely by recycling of flower waste through composting, as the most important environmentally sustainable attributes that could be added to the floral providers’ business models to increase their willingness to make purchases (Table 3). Based on these answers, of the environmentally sustainable attributes they were asked about, these two features are the most important environmentally sustainable attributes that retail floral providers could offer to increase the willingness to purchase. Research of European consumers’ purchasing preferences for flowers and plants found increasing evidence indicating that consumers value a product’s origin and prefer locally grown and seasonal flowers (Gabellini and Scaramuzzi 2022).

An additional five questions asked respondents to indicate how much more, if any, they would be willing to pay for flowers from floral providers based on environmentally sustainable attributes. Respondents indicated the strongest willingness to pay 10% or more for locally sourced flowers, followed by flower providers that compost their floral waste, in all US regions (Table 4). An ANOVA indicated that differences in the way respondents answered the following two questions, “Please indicate how much more, if any, you would be willing to pay for a flower arrangement made by a retail floral provider that recycles their flower waste through composting rather than disposing of

floral waste in a municipal landfill” and “Please indicate how much more, if any, you would be willing to pay for a flower arrangement made using fair-trade sourced flowers (fair-trade can be defined as trade between companies in developed countries and producers in developing countries in which fair prices are paid to the producers),” based on the region where they live. A post hoc (LSD) analysis indicated that participants from the West and Northeast were more willing to pay a premium for floral products from floral providers that compost their floral waste as well as from floral providers that use fair-trade sources (Table 4). Overall, respondents from the West and Northeast were more willing to pay a premium for all the environmentally sustainable attributes they were asked about, with those from the Midwest indicating the least willingness to pay for a majority of the environmentally sustainable attributes compared with residents from other regions (Table 4). This supports research that also found that residents from the Midwest were least likely to believe in climate change, and that those from the Northeast and West were most likely to believe in climate change (Marlon et al. 2021). Research has indicated that the premium a consumer is willing to pay varies depending on the specific environmental attribute (Khachatryan et al. 2014).

**RESPONDENTS’ RESPONSES TO RANKING THE IMPORTANCE OF ENVIRONMENTAL ATTRIBUTES.** Respondents were asked to rank a list of environmental attributes as well as the options of reasonable prices from most important to least important when deciding where to make flower purchases. Overall, respondents indicated reasonable prices as the most important aspect when making a floral purchase, followed by using locally sourced flowers, with the use of fair-trade flowers being least important (Table 5). The ANOVA indicated differences in the way respondents ranked two of the answer choices based on the region where they live. A post hoc (LSD) analysis found that respondents who live in the Midwest were more concerned about “reasonable prices” when compared with respondents in all other regions ( $P = 0.004$ ). Additionally, an analysis indicated that respondents in the Western region of the United States

were slightly more concerned about the use of fair-trade products when compared with respondents in other regions ( $P = 0.004$ ) (Table 5).

A Kendall’s coefficient of concordance (Kendall’s W) analysis was performed to determine how much respondents agreed about the order in which choices were ranked; the closer the finding was to 1 indicated more agreement among respondents regarding the order in which the answer choices should be ranked. Kendall’s W analysis indicated a score of 0.175, which indicated an elevated level of disagreement among respondents regarding the order in which the answer choices should be ranked.

A follow-up question was asked to further investigate respondents’ perceptions when deciding where to make a floral purchase based on environmentally sustainable aspects of the flower provider. Respondents were asked to select the single environmentally sustainable aspect they considered to be the most important. The ANOVA indicated no differences in the way respondents answered this question based on the region where they live. Several respondents from all regions indicated that the most important aspect was “materials (other than flowers) used in floral design, are sustainable, recyclable, upcyclable, reusable” (West: 33.0%; Midwest: 35.6%; South: 28.3%; Northeast: 32.1%). These findings did not align with the findings of other questions asked regarding the importance of environmentally sustainable attributes. For all other questions that asked respondents to select which environmental attribute is most important when selecting a flower provider, respondents indicated the use of locally grown flowers. Regarding the wording of the answer choices, the phrase “locally sourced flowers” was not used; rather, a more general answer choice, “flowers used in floral designs are sustainably grown and sourced,” was provided. The fact that the respondents’ answers to this question differed indicates that the phrase “locally sourced” is potentially an important trigger for consumers when making purchasing decisions (Table 6). Trigger words and phrases are used in marketing to help persuade consumers and inspire them to act (Troncoso 2023). Research has found that many consumers have

Table 4. ANOVA and descriptive statistics indicating significant differences in the way respondents responded to five questions pertaining to how much more they would be willing to pay for flowers from floral providers that incorporates sustainable attributes into their businesses based on the respondent's regional geographic location within the United States.

Statement	N	Respondents willing to pay, %					df	F	P
		0%	≥5%	≥10%	≥15%	≥20%			
Question: Please indicate how much more, if any, you would be willing to pay for a flower arrangement made by a retail floral provider that recycles their flower waste through composting rather than disposing of floral waste in a municipal landfill.									
US region: West a <sup>i,ii</sup>	500	18.6	17.6	28.4	15.0	12.0	8.4		
US region: Midwest b	480	20.6	22.3	28.5	13.1	7.9	7.5		
US region: South b	760	22.5	20.8	28.7	11.8	8.6	7.6		
US region: Northeast a	424	17.2	19.8	28.3	14.9	11.1	8.7		
Question: Please indicate how much more, if any, you would be willing to pay for a flower arrangement made using locally grown flowers (grown within 100 miles of the retail floral provider).									
US region: West	500	15.8	19.8	31.2	13.8	13.4	6.0		
US region: Midwest	480	19.6	21.9	26.5	14.4	8.5	9.2		
US region: South	760	17.0	22.1	28.7	15.9	8.6	7.8		
US region: Northeast	424	16.0	19.8	29.7	13.7	12.3	8.5		
Question: Please indicate how much more, if any, you would be willing to pay for a flower arrangement made using organically grown flowers (flowers grown and processed using no synthetic fertilizers or pesticides).									
US region: West	500	24.2	21.8	24.2	13.8	10.2	5.8		
US region: Midwest	480	30.6	21.9	19.4	14.0	7.9	6.3		
US region: South	760	29.5	18.8	26.4	10.8	8.9	5.5		
US region: Northeast	424	25.0	17.5	26.4	15.3	9.0	6.8		
Question: Please indicate how much more, if any, you would be willing to pay for a flower arrangement made using fair-trade sourced flowers (fair-trade can be defined as trade between companies in developed countries and producers in developing countries in which fair prices are paid to the producers).									
US region: West a	500	20.2	23.0	26.4	15.2	10.4	4.8		
US region: Midwest b	480	32.1	23.1	23.1	11.5	6.7	3.5		
US region: South bc	760	28.8	22.2	24.9	12.2	6.8	5.0		
US region: Northeast ac	424	24.5	23.6	26.4	13.7	6.8	5.0		
Question: Please indicate how much more, if any, you would be willing to pay for a flower arrangement made using sustainable, recycled, upcycled, and/or reusable materials instead of single-use products.									
US region: West	500	19.4	22.6	28.2	13.6	10.2	6.0		
US region: Midwest	480	24.4	22.3	25.8	11.7	9.6	6.3		
US region: South	760	23.7	21.7	27.4	14.1	8.0	5.1		
US region: Northeast	424	21.0	21.7	27.4	12.5	9.4	8.0		

<sup>i</sup> Regions followed by the same letter are not significantly different at  $P \leq 0.05$  according to the least significant difference test.

<sup>ii</sup> Refer to Table 1 for a list of states by region.

\* Statistically significant at  $P \leq 0.05$ .

df = degrees of freedom.



**Table 5.** Kendall's W analysis indicating ranking responses to "Please rank the importance of the listed considerations when deciding where to make floral purchases. With 1 being the most important consideration and 6 being the least important. If you do not make floral purchases, please skip this question, and move onto the next" based on their US region.

Answer choices	West <sup>i</sup>		Midwest		South		Northeast		df	F	P
	N	Mean	N	Mean	N	Mean	N	Mean			
Reasonable prices	447	2.40 a <sup>ii</sup>	431	2.03 b	656	2.36 a	368	2.35 a	3	4.536	0.004*
Use of locally sourced flowers	447	2.79	431	2.71	656	2.71	368	2.85	3	0.989	0.397
Use of organically grown flowers	447	3.83	431	3.93	656	3.77	368	3.82	3	0.973	0.405
Use of multiuse products (sustainable, recycled, upcycled, and/or reusable materials) instead of single-use products	447	3.76	431	3.79	656	4.90	368	3.79	3	0.907	0.437
Use of energy-saving practices such as energy-efficient light bulbs, coolers, and electric vehicles	447	4.16	431	4.14	656	4.09	368	3.95	3	1.851	0.136
Use of fair-trade flowers	447	3.97 a	431	4.32 bc	656	4.17 bd	368	4.16 acd	3	4.540	0.004*

<sup>i</sup> Refer to Table 1 for a list of states by region.

<sup>ii</sup> Means followed by the same letter are not significantly different at  $P \leq 0.05$  according to the least significant differences test.

\* Statistically significant at  $P \leq 0.05$ .

df = degrees of freedom.

inaccurate perceptions of local terminology, and that education could be added to the marketing process to help clarify terminology for consumers (Campbell et al. 2014).

**RESPONDENTS' PERCEPTIONS REGARDING AN ENVIRONMENTALLY FRIENDLY CERTIFICATION.** Respondents were asked two questions pertaining to their perceptions of the creation of an environmentally friendly certification for floral providers. The ANOVA indicated no significant differences in the way respondents answered the questions based on the region where they live in the United States. The majority of respondents within all regions indicated that they would be more willing to shop at a certified floral provider and that they

would trust a certified floral provider's environmental standards based on the certification (Table 7). Most respondents from all regions indicated that they would be willing to pay at least 10% more for flowers from a certified environmentally friendly floral provider; this is consistent with the findings of previous questions regarding respondents' willingness to pay for environmentally sustainable floral attributes (Table 8). Although respondents from the Midwest indicated the strongest willingness to purchase from a certified eco-friendly floral provider, they indicated the least willingness to pay a premium for floral products from a certified eco-friendly floral provider. Respondents from the Northeast

indicated the strongest willingness to purchase from a certified eco-friendly floral provider as well as the strongest agreement to pay a premium. These findings support research that found that certifications had a positive effect on consumers' perceived value and were positively linked to green behavioral intentions, including the intention to pay a premium (Lee et al. 2019).

## Conclusions

Because environmentally conscious consumers are taking more interest in how the products they purchase are designed and sourced, the ways that retail floral providers source floral materials, create floral designs, and market and

**Table 6.** Respondents' responses to "When deciding where to make a floral purchase, which of the following aspects of sustainability do you consider to be the most important for a retail floral provider to practice?" based on their US region.

Answer choices	West <sup>i</sup>		Midwest		South		Northeast	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Flowers used in floral designs are sustainably grown and sourced	143	28.6	124	25.8	216	28.4	130	30.7
Materials (other than flowers) used in floral design, are sustainable, recyclable, upcyclable, reusable	165	33.0	171	35.6	215	28.3	136	32.1
Floral provider is as energy-efficient as possible (uses energy-efficient light bulbs, coolers, electric vehicles, etc.)	67	13.4	59	12.3	117	15.4	60	14.2
None of the above are important to me when making a floral purchase	88	17.6	89	18.5	142	18.7	67	15.8
I do not make floral purchases	37	7.4	37	7.7	70	9.2	31	7.3

<sup>i</sup> Refer to Table 1 for a list of states by region.

**Table 7. Respondents' responses to questions pertaining to their overall trust and willingness to purchase flowers from floral providers that are certified as environmentally friendly compared with floral providers without a certification based on their US region.**

Statement	West <sup>i</sup>		Midwest		South		Northeast	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Question: If an environmentally friendly certification existed for retail flower providers, I would be more willing to make purchases from a certified environmentally friendly retail flower provider than from a retail flower provider not certified.								
Choice 1: Strongly agree	96	19.2	96	20.0	115	15.1	77	18.2
Choice 2: Agree	185	37.0	182	37.9	289	38.0	170	40.1
Choice 3: Neither agree nor disagree	144	28.8	145	30.2	251	33.0	104	24.5
Choice 4: Disagree	59	11.8	40	8.3	73	9.6	43	10.1
Choice 5: Strongly disagree	16	3.2	17	3.5	32	4.2	30	7.1
Question: If an environmentally friendly certification existed for retail flower providers, I would trust a retail flower provider's environmental quality standards when purchasing from an environmentally-friendly-certified retail flower provider.								
Choice 1: Strongly agree	86	17.2	82	17.1	107	14.1	67	15.8
Choice 2: Agree	200	40.0	197	41.0	299	39.3	172	40.6
Choice 3: Neither agree nor disagree	146	29.2	130	27.1	241	31.7	117	27.6
Choice 4: Disagree	55	11.0	57	11.9	81	10.7	38	9.0
Choice 5: Strongly disagree	13	2.6	14	2.9	32	4.2	30	7.1

<sup>i</sup> Refer to Table 1 for a list of states by region.

brand their company are increasingly becoming important considerations. Through the introduction of sustainable practices into their business models, retail floral providers have the potential to boost economic performance and enhance profitability.

Regardless of the US region, from the list of environmentally sustainable attributes covered in this study, respondents indicated the use of locally sourced flowers and the composting of floral waste as being the two environmentally sustainable attributes that could be incorporated into the floral providers' business models that have the most perceived value to consumers. However, the findings of this study indicate that floral providers that have incorporated any type of environmentally sustainable attribute into their busi-

ness should be promoting this to the public. Floral providers located in the West and Northeast regions of the United States should especially consider emphasizing environmentally sustainable attributes of their businesses because consumers in these regions indicated the most willingness to pay premiums for environmentally sustainable practices. Floral providers in the West should consider sourcing and promoting the use of fair-trade materials because respondents in this region indicated more concern regarding this specific sustainable attribute compared with respondents in other regions.

Consumers in all regions indicated that they would be more willing to make purchases from certified floral providers rather than floral providers that are not certified. This indicates a possible need for organizations within

the floriculture industry to establish an environmentally sustainable certification program for floral providers.

To gain a deeper understanding of how consumers perceive environmental attributes based on geographical location, further studies of this subject based on geographical divisions and individual states should be conducted. Additionally, research should explore which, if any, environmentally sustainable attributes that floral providers have already incorporated into their business models.

Because this was a preliminary study of consumer-stated preferences for hypothetical environmentally sustainable attributes that could be incorporated into retail floral providers' businesses, future studies should investigate this topic to reveal preferences and ascertain whether participants' real-

**Table 8. Respondents' responses to "Please indicate how much more, if any, you would be willing to pay for flowers and floral designs from an environmentally friendly-certified retail flower provider if such a certification existed" based on their US region.**

Answer choices	West <sup>i</sup>		Midwest		South		Northeast	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
0%	109	21.8	111	23.1	178	23.4	89	21.0
5%	112	22.4	117	24.4	167	22.0	94	22.2
10%	127	25.4	129	26.9	209	27.5	117	27.6
15%	76	15.2	63	13.1	120	15.8	55	13.0
20%	57	11.4	36	7.5	52	6.8	46	10.8
≥25%	19	3.8	24	5.0	34	4.5	23	5.4

<sup>i</sup> Refer to Table 1 for a list of states by region.

world purchasing decisions indeed reflect these survey findings.

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