

# DO REGION AND GENDER INFLUENCE HARDWOOD PRODUCT SELECTION?

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**Abstract.**—Consumer preference is a fundamental focus of marketing research as it is used in developing marketing strategy and the positioning of products against competitors. This study evaluated consumer hardwood preferences of consumers from three United States geographical regions, which included six different metropolitan areas. Seven hardwood species and three laminate hardwood types were assessed. Significant statistical differences in preferences were found. Results of this study could be incorporated into marketing strategies for hardwood products.

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## INTRODUCTION

The globalization of wood product markets during the past two decades has led U.S. consumers to use and accept species originating in other regions of the world for furniture, cabinet, millwork, and flooring products. The loss of market share for U.S. hardwood species was a contributing factor to the closure of 17 percent of U.S. hardwood sawmills between 2000 and 2009 (Buehlmann et al. 2007, Woodall et al. 2012) and a 25 to 35 percent permanent decline in hardwood processing and manufacturing capacity by the end of 2009 (Manchester et al. 2009). The principal goal of this research was to determine if expressed preferences exist for eastern hardwood species, and if so, determine how these differences may be exploited to increase markets for U.S. hardwoods.

In marketing manufactured goods, businesses and marketing professionals formulate overviews of demographic groups to create effective marketing communications. To be successful, knowledge of target markets, preferences, and traits of potential consumers within each market segment is needed. Gender and location data can provide information to develop consumer preference insights.

It has been found that women buy or influence the purchase of 80 percent of all consumer goods in the United States (Nielsenwire 2009). Women similarly influence furniture purchase decisions (Finney 2000). The purchase decisions of women may be influenced by cultural, social, psychological, and physiological perceptions. Some of these perceptions have been shown to differ between genders; men and women have different responses to blue and red light wavelengths and women have heightened sensitivity to the long-wave spectrum of light such as yellows and reds (Moss 2009). Also, a greater proportion of men are color blind (Moore 2008, Moss 2009). Women also have better memory for detailed information than men, and men tend to have better spatial ability (Nielsenwire 2009). Another gender difference is that, in the majority of all male purchases, men consistently masculinize their preferences (Gal and Wilkie 2010). Because of these various gender-based differences in perception, an objective of this study was to examine whether there were gender differences among potential consumers in expressed preferences for table tops made from seven different wood species.

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In addition, location is thought to be a relevant factor in measuring consumer perceptions of wood species as revealed preferences are considered malleable and subject to contextual influence (Eagley and Chaiken 1993). For example, consumers living in Boston may have different needs and tastes from those living in rural Virginia. From a marketing perspective, knowledge of location characteristics enables companies to target customers according to observed local preferences. Thus, the final study objective was to examine if location-based differences exist in the perceptions of potential consumers for seven species of wood.

## RESEARCH OBJECTIVES

- 1) Discern if United States consumers have a preference for selected eastern hardwood species
- 2) Identify attributes, opportunities, and weaknesses of selected eastern hardwood species
- 3) Determine if gender differences exist in the attribute ratings assigned to the seven species by participants
- 4) Determine if location differences exist in the attribute ratings assigned to the seven species by participants

## METHODS

To investigate a potential species' effect, we designed table tops for end tables. The tops were manufactured from the following species: black cherry (*Prunus serotina*), sugar maple (*Acer saccharum*), white oak (*Quercus alba*); foreign species included rubberwood (*Hevea brasiliensis*), European beech (*Fagus sylvatica*), Lyptus®, marketed as a Brazilian cherry (*Eucalyptus grandis* var. *urophylla*), and American basswood (*Tilia americana*), used as a substitute for Norway maple (*Acer platanoides*). The fabricator of the table tops was unable to procure a sufficient quantity of Norway maple and after careful consideration decided to use American basswood. Table tops also were manufactured from laminate material, which included black cherry, sugar maple, and white oak. In addition, finger-jointed tables were manufactured from black cherry, sugar maple, white oak, rubberwood, European beech, Lyptus®, and basswood. We focused on species whose characteristics were in style to reduce outlier effects that would occur by including species that consumers would not consider when they decide to purchase furniture.

Attribute information was collected by a team from Virginia Tech's Pamplin College of Business, Department of Marketing by means of field studies. The focus of the field studies was to gain an in-depth understanding of raw material preferences and material attributes. Space was rented in shopping malls located in Green Bay and Madison, WI; Hyattsville, MD; Christiansburg and Norfolk, VA; and Dartmouth, MA (Table 1). The end tables were evaluated during a 1-month period, primarily on weekends. The total number of participants was 1,008. The number of male and female participants was very similar (Table 2).

Responses were collected by use of a questionnaire that consisted of three sections: (1) introduction, (2) demographic information, and (3) attribute assessment by species. Question items used a Likert scale ranging from 1 to 7 anchored by "I like it" and "I don't like it," with intervals of (1 = extremely, 2 = quite, 3 = slightly, 4 = neither, 5 = slightly, 6 = quite, 7 = extremely). Attributes rated were color, color intensity, natural blemishes, grain density, grain pattern, finish (sheen or luster), naturalness, warmth, and coldness.

**Table 1.—Location and number of subjects**

Site	N	Percent
Green Bay-Madison, WI	223	22.1
Christiansburg, VA	263	26.1
Hyattsville, MD	247	24.5
Newport News, VA	127	12.6
Dartmouth, MA	148	14.7
Total	1,008	100.0

**Table 2.—Gender of subjects**

Gender	N	Percent
Male	479	47.5
Female	468	46.4
Sub-total	947	93.9
Missing	61	6.1
Total	1,008	100.0

Several statistical techniques were used to analyze the data: independent samples t-tests, one-way ANOVA, and principal components analysis (PCA). All statistical techniques used a significance level of  $\alpha = 0.05$ . SPSS® (2009) 18.0 was used for all analysis. PCA was used for data reduction to simplify the data by reducing a large set of variables to a lesser number for analysis. In the results, attribute factor loadings of 0.7 or greater were retained for further analysis. The rationale is that this level corresponds to about one-half of the variance in the questionnaire item being elucidated by the factor.

## RESULTS

The highest rated species, in terms of visual preference, were Lyptus®, black cherry, white oak, and European beech, respectively. Analysis revealed there were no statistical differences between gender among and between the species ( $\alpha = 0.05$ ); location differences were discerned. The lowest rated species/products were the laminates and American basswood. Of note is the similarity of the Lyptus® and cherry ratings. The Lyptus® boards were specifically selected to be contrasted against cherry. Another contrast investigated was between white oak and European beech; as in the previously mentioned pair, the ratings for the latter two species also were similar (Table 3.)

Willingness-to-pay entails a subject's dollar value estimate of what she or he would pay for a discrete table top. Willingness-to-pay also can be considered a proxy for overall species judgments, as similar findings to the overall evaluative ratings were discerned. Lyptus® and black cherry were the species that the subjects indicated they would pay most to purchase and were statistically significant ( $p = 0.001$ ) from other species, as were white oak and European beech (Table 4). No other statistical differences were discerned in the willingness-to-pay evaluation.

**Table 3.—Overall rating means and standard deviations for each species**

Species	N	Mean ( $\bar{x}$ )	S. D.
Lyptus®	994	2.11	1.45
Cherry	988	2.41	1.55
White oak	991	2.80	1.66
European beech	984	2.88	1.46
Sugar maple	987	3.04	1.57
Rubberwood	995	3.11	1.68
Cherry laminate	988	3.23	1.85
Basswood	984	3.35	1.62
Maple laminate	985	4.19	1.92
White oak laminate	984	4.78	1.90

**Table 4.—Overall species price means and standard deviations: willingness-to-pay for a table produced from a particular species**

Species	N	Mean ( $\bar{x}$ )	S. D.
Lyptus®	902	131.75	127.99
Cherry	916	120.47	122.89
White oak	910	102.10	108.58
European beech	897	91.21	100.85
Sugar maple	904	89.93	98.34
Rubberwood	912	89.36	101.97
Cherry laminate	903	86.70	103.67
Basswood	902	82.75	97.52
Maple laminate	905	63.99	86.76
White oak laminate	898	54.13	79.36

## SPECIES ANALYSIS AND DISCUSSION

### Lyptus®

Lyptus® was the highest rated species or product. Of note were the ratings for color ( $\bar{x} = 2.00$ ), color intensity ( $\bar{x} = 2.04$ ), a natural look ( $\bar{x} = 2.27$ ), and warmness ( $\bar{x} = 2.16$ ). Subjects valued Lyptus® most highly in pricing and potential purchase. Statistical differences were not found between genders nor locations for the overall rating or for any of the nine specific appearance attribute ratings. From a marketing promotion perspective, this finding suggests that market segmentation by gender or location is unnecessary.

### Black Cherry

The second highest rated species or product was black cherry. Important ratings were discerned for color ( $\bar{x} = 2.30$ ), color intensity ( $\bar{x} = 2.41$ ), natural look ( $\bar{x} = 2.42$ ), and warmness ( $\bar{x} = 2.42$ ). Although cherry was rated somewhat lower than Lyptus®, the ratings for natural look, warmness, and coldness were very similar. Again, no statistical differences in preference were found between the genders or locations for the attribute ratings for this species.

## White Oak

White oak was the third highest rated species; key ratings were color ( $\bar{x} = 2.86$ ), color intensity ( $\bar{x} = 2.86$ ), natural look ( $\bar{x} = 2.63$ ), and warmth ( $\bar{x} = 2.79$ ). The color ( $p = 0.003$ ) and color intensity ( $p = 0.01$ ) rating means were statistically different for gender, suggesting that market segmentation by gender should be considered, because males may prefer a light, grainy appearance found in white oak. Thus, this may present a product positioning opportunity for white oak. Statistical differences were not found for location.

## European Beech

The fourth highest rated species or product was European beech. Important attribute ratings were similar to white oak: color ( $\bar{x} = 2.77$ ) and color intensity ( $\bar{x} = 2.84$ ). No statistical differences for color were found between genders or locations. A statistical difference was discerned between males and females for color intensity ( $p < 0.01$ ), suggesting that promotional efforts should emphasize color intensity for women, if the product is manufactured to emphasize this attribute.

## Sugar Maple

Sugar maple was the fifth rated species or product. Color ( $\bar{x} = 3.06$ ) and color intensity ( $\bar{x} = 3.18$ ) were the top two attributes noted by the subjects for this species, but they both received nearly neutral (3.5 on a 7-point scale) ratings. There were no statistical differences found between gender or locations for color and color intensity, signifying that market segmentation by gender or location is unnecessary.

## Rubberwood

Rubberwood was the sixth highest rated species or product. Color ( $\bar{x} = 3.12$ ) and color intensity ( $\bar{x} = 3.10$ ) were rated near neutral. Statistical differences between genders for color ( $p = 0.01$ ) and color intensity ( $p = 0.05$ ) were found; men preferred rubberwood's color more than women, suggesting that businesses should consider treating the color of rubberwood as a segmentation and positioning factor.

Regarding location, several statistical differences were discerned for rubberwood in color and color intensity. In the color analysis, differences were found between Green Bay-Madison and Christiansburg ( $p < 0.01$ ), Green Bay-Madison and Hyattsville ( $p < 0.01$ ), and Green Bay-Madison and Dartmouth ( $p < 0.01$ ). For color intensity, statistical differences were found between Green Bay-Madison and Christiansburg ( $p = 0.05$ ), Green Bay-Madison and Hyattsville ( $p < 0.01$ ), and Green Bay-Madison and Dartmouth ( $p < 0.01$ ). Again, these findings indicate color and color intensity are attributes that can be used in marketing segmentation and product positioning.

## CONCLUSIONS

Gender and location differences were found to exist in the rating of various appearance attributes associated with seven species of wood manufactured into table tops. Differences related to color and color intensity were more commonly based on gender than on location. According to recent research, "Women notice nuance," said Jennifer Ganshirt, who was interviewed for a 2008 article in *Dynamic Graphics + Create* magazine (Moore 2008). In gender marketing, color is important, because color

may create a distinct and subconscious response (Gunelius 2011). Thus, the practical implications for marketing strategy, marketing communications, product positioning, and marketing tactics are evident. Products should be marketed to women differently for several reasons: (1) women make an estimated 80 percent of all furniture purchases (Finney 2000); (2) women are more color precise and detect even a slight change in color (Gunelius 2011); and (3) a greater proportion of men are color blind (Moore 2008, Moss 2009). Hardwood producers and manufacturers, retail stores, and marketers should specifically strategize about how they may best appeal to women. Firms should endeavor to get wood products and design (which also includes color), marketing communications, and other product characteristics in sync with how the female subconscious mind receives and processes information. This may greatly increase marketplace success.

From a marketing perspective, knowledge of location preferences and consumer characteristics enables marketers to target customers according to actual local preferences in real time. In this study, one species produced a statistical location difference, rubberwood. Logically, it would seem that there are other species that would produce a similar result. One tactic is to present detailed product information (i.e., species, origin, sustainability, and color). From this, a retailer may be able to create repeat customer visits and word-of-mouth marketing.

## STUDY LIMITATIONS

The lumber used in the fabrication of the table tops was not stained; rather the table tops were built from the material as received, with only a clear coating applied. We chose not to stain the wood due to the many different types of stains available since we did not have enough funding to conduct research on all combinations of species and stain. Finally, this study represents a snapshot in time of U.S. consumers and can be expected to change over time given societal shifts in priorities and fashion sense.

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