

# Evaluating selected demographic factors related to consumer preferences for furniture from commercial and from underutilized species

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## Abstract

This technical note describes consumer preferences within selected demographic categories in two major Pacific Northwest markets for six domestic wood species. These woods were considered for construction of four furniture pieces. Chi-square tests were performed to determine species preferences based on gender, age, and income. Age and income were statistically significant (with a stronger effect for age); gender was not significant. Older respondents preferred oak while younger respondents preferred spruce. Cherry was preferred by respondents in higher income categories and oak by respondents in lower income categories. Maple was preferred by younger male respondents, while birch was preferred by lower income males. Lastly, red alder was found to have lower preference among females in higher income categories. Such information is useful for considering the role that species choice can play in the development of customized products by the domestic furniture industry.

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Manufacture of custom products is often cited as a strategy for domestic firms to compete against the commodity-like offerings produced in foreign locations (Schuler and Buehlmann 2003). Offering a specific piece of furniture produced from several different species is a possible element of customization. For wood products manufacturers to accurately identify target markets, information is needed regarding the demographic segments that favor specific products. In market segmentation, an overall group of consumers is divided into similar groups having homogenous needs (Sinclair 1992). These groups can vary with respect to purchasing power, wants, geographic locations, buying attitudes, and buying practices (Kotler 1991).

Two ways to achieve market segmentation include divisions based on consumer demographics and on geography (Smith and Olah 2000). We followed this approach in our current study, where markets for furniture of various species used in household furniture were segmented based on the demographic factors of age, gender, and income. These factors have been found to be related to preferences for a variety of wood products (Nicholls and Stiefel 2007), and perceptions associated with certain wood species have been influenced by gender (Blomgren 1965, Bumgardner and Bowe 2002).

Both eastern and western U.S. hardwoods are commercially important in furniture production. Among eastern hardwoods, furniture and cabinet markets are now favoring fine-grained species such as black cherry (*Prunus serotina* Ehrh.) and maple (*Acer* spp.), while using less lumber from coarse-grained species like oak (*Quercus*, spp.). This in part has been reflected by generally declining oak lumber prices as well as a weaker presence (i.e., percentage of groups shown) at national furniture markets (Luppold and Bumgardner 2005). Although red and white oak are still used in many secondary wood prod-

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Forest Prod. J. 57(12):79-82.

ucts, there is potential for using other species in office furniture (Smith et al. 2005).

Among western hardwoods, red alder (*Alnus rubra* Bong.) has become a major species used to produce a variety of furniture products. In Washington state, the average volume of red alder harvested annually was 212 MMBF between 1992 and 2002 (Larsen and Nguyen 2004). Lower grades of red alder, including “knotty” red alder, have become increasingly popular and represent a means of capturing premium prices for less valuable material. Paper birch (*Betula papyrifera* Marsh.) in Alaska has been used to a limited extent within niche markets such as flooring, cabinetry, and craft products. In a competitive industry, western and eastern species are able to serve niches within broader markets, and it is therefore important to accurately characterize consumer preferences for these species.

Specific information about preferences of demographic groups for given products should help wood products manufacturers better utilize the species available to them, particularly as part of a customization strategy. The focus of this study is to evaluate how age, gender, and income influence consumer preferences for species use in household furniture products. Gender was of specific interest, given the influence of this factor to species perceptions as noted in previous studies. This work is based on a broader study which also considered the effects of pricing and species information on consumer preferences for wood use in furniture (Bumgardner et al. 2007). For this technical note we identify possible demographic segments to target for marketing various wood species. Our research questions included:

How do species preferences vary among specific demographic groups based on gender, age, and income?

For a given age category, how do male and female respondents differ?

For a given income category, how do male and female respondents differ?

## Methods

### Data collection

Data were collected at two Pacific Northwest home shows (Seattle, Washington, and Portland, Oregon) in late 2004 and early 2005. A total of 1,125 respondents participated. No screening of respondents was done other than a minimum age of 18 years. An incentive was offered to participants who provided responses.

Respondents visiting the booth indicated which of six species samples they preferred for each of four furniture pieces. The six species included cherry, maple, oak, spruce (*Picea glauca* (Moench) Voss), birch, and alder. An artist’s rendition of the furniture pieces included only line drawings, so that responses would not be biased by attributes such as color, texture, or grain patterns. Scale was indicated by including common household items as part of the drawings. The question used for evaluation was, “If you were to purchase this [furniture piece name] for your home, which wood sample would you prefer?” Defect-free wood samples having a clear coat finish were used (in combination with the pictures) as proxies for actual furniture pieces (samples were 8 inches long by 5 inches wide). The clearwood samples used were chosen to be representative of each species, and represented a wide range of color, from birch and maple (light) to cherry (darker).

Collected demographic information included respondent age, gender, household income, and home ownership. The home ownership rate in the sample was nearly 90 percent. A limitation of this study was that the data collection was non-random and regional, taking place at Pacific Northwest locations only. Past research has shown that respondents at events such as these tend to be older and wealthier than the population at large (Nicholls et al. 2004).

### Furniture piece and species selection

Four furniture pieces were evaluated in this study: an entertainment center, a dresser, a hutch, and a desk. These pieces were chosen to represent a broad cross section of furniture styles and sizes, and are among the most commonly purchased products according to a national survey of household furniture manufacturers (Meyer et al. 1992). When choosing favorite species for a given furniture piece, respondents viewed 6 clearwood samples mentioned previously (each of a different species). The species evaluated in this study represent both commercially important species and underutilized species from eastern and western U.S. regions. This group of species allowed for regional comparisons, while also including several species generally considered underutilized, that could have considerable market potential (Donovan et al. 2003).

### Data analysis

All statistical analyses were based on chi-square tests of two-way tables. We used tests for independence to determine if gender, age, or income affected overall species preferences. Similar tests were done to determine if there were differences in preferences between male and female respondents based on age and income. While in the previous study the furniture pieces were analyzed separately, the data were pooled for the present analysis. Here, all furniture pieces were considered together, so each respondent posted four species preference responses. The data also were pooled across four separate treatments, with the sample split nearly equally between respondents presented with low or high priced furniture pieces, with species information present or absent. Each treatment group had a similar demographic composition.

Segmentation factors included three age categories: 18 to 40 years (29% of the sample), 41 to 50 years (31% of the sample), and 51 years or older (39% of the sample). We also considered three levels of annual household income: \$50K or less (25% of the sample), \$51K to \$100K (50% of the sample), and greater than \$100K (25% of the sample). Gender was also considered, and respondents were 55 percent females and 45 percent males. As part of the analyses, chi-square statistics, Cramer V statistics, and cell chi-square values were calculated.

## Results and discussion

**Table 1** presents overall results for species preferences by gender, age, and income for this sample of attendees at Pacific Northwest home shows. There was a significant age effect, with a moderate strength of association (as measured by Cramer’s V statistic). Spruce was preferred by younger consumers, and oak was preferred by older consumers. The income effect also was significant, but the strength of association was weaker. Cherry was preferred by higher income consumers and oak by lower income consumers. These results indicate that the age effect is stronger than the income effect for species preference, and that oak’s niche is with older, lower income consumers. Cherry’s position as a status wood also was

Table 1. — Overall results for species preferences in household furniture construction by gender, age, and income.

| Category | $\chi^2_{(df)}$        | Sig.  | N <sup>a</sup> | Cramer V | Level           | Cell results <sup>b</sup> | Cell values |
|----------|------------------------|-------|----------------|----------|-----------------|---------------------------|-------------|
| gender   | 6.58 <sub>(5)</sub>    | 0.25  | 4300           | --       | --              | --                        | --          |
| age      | 139.53 <sub>(10)</sub> | <0.01 | 4396           | 0.13     | 18 to 40 years  | oak (-)                   | 49.5        |
|          |                        |       |                |          |                 | spruce (+)                | 25.0        |
|          |                        |       |                |          | 41 to 50 years  | --                        | --          |
|          |                        |       |                |          | 51 + years      | oak (+)                   | 25.4        |
| income   | 36.27 <sub>(10)</sub>  | <0.01 | 3996           | 0.07     | \$50K or less   | spruce (-)                | 18.0        |
|          |                        |       |                |          |                 | cherry (-)                | 10.3        |
|          |                        |       |                |          | \$51K to \$100K | oak (+)                   | 6.1         |
|          |                        |       |                |          |                 | --                        | --          |
|          |                        |       |                |          |                 | >\$100K                   | cherry (+)  |

<sup>a</sup>This reflects number of respondents 4x, as each respondent evaluated four furniture pieces.

<sup>b</sup>(+) = higher than expected frequency in the cell; (-) = lower than expected frequency.

Table 2. — Results for species preferences (in household furniture construction) for gender by age.

| Category   | $\chi^2_{(df)}$       | Sig.  | N <sup>a</sup> | Cramer V | Level          | Cell results <sup>b</sup> | Cell values |
|------------|-----------------------|-------|----------------|----------|----------------|---------------------------|-------------|
| male       | 63.80 <sub>(10)</sub> | <0.01 | 1921           | 0.13     | 18 to 40 years | oak (-)                   | 17.2        |
|            |                       |       |                |          |                | spruce (+)                | 5.6         |
|            |                       |       |                |          | 41 to 50 years | maple (+)                 | 5.5         |
|            |                       |       |                |          |                | --                        | --          |
| female     | 89.35 <sub>(10)</sub> | <0.01 | 2363           | 0.14     | 51 + years     | oak (+)                   | 17.1        |
|            |                       |       |                |          |                | spruce (-)                | 6.9         |
|            |                       |       |                |          | 18 to 40 years | oak (-)                   | 29.6        |
|            |                       |       |                |          |                | spruce (+)                | 19.5        |
|            |                       |       |                |          |                | 41 to 50 years            | --          |
| 51 + years | spruce (-)            | 10.7  |                |          |                |                           |             |
|            | oak (+)               | 8.2   |                |          |                |                           |             |

<sup>a</sup>This reflects number of respondents 4x, as each respondent evaluated four furniture pieces.

<sup>b</sup>(+) = higher than expected frequency in the cell; (-) = lower than expected frequency.

Table 3. — Results for species preferences (in household furniture construction) for gender by income.

| Category | $\chi^2_{(df)}$       | Sig.  | N <sup>a</sup> | Cramer V | Level           | Cell results <sup>b</sup> | Cell values |
|----------|-----------------------|-------|----------------|----------|-----------------|---------------------------|-------------|
| male     | 22.46 <sub>(10)</sub> | 0.01  | 1825           | 0.08     | \$50K or less   | cherry (-)                | 3.3         |
|          |                       |       |                |          |                 | oak (+)                   | 2.6         |
|          |                       |       |                |          |                 | birch (+)                 | 2.4         |
|          |                       |       |                |          | \$51K to \$100K | --                        | --          |
|          |                       |       |                |          |                 | > \$100K                  | oak (-)     |
| female   | 33.05 <sub>(10)</sub> | <0.01 | 2083           | 0.09     | \$50K or less   | cherry (+)                | 3.9         |
|          |                       |       |                |          |                 | cherry (-)                | 7.6         |
|          |                       |       |                |          | \$51K to \$100K | oak (+)                   | 4.1         |
|          |                       |       |                |          |                 | --                        | --          |
|          |                       |       |                |          |                 | > \$100K                  | cherry (+)  |
|          | red alder (-)         | 3.1   |                |          |                 |                           |             |

<sup>a</sup>This reflects number of respondents 4x, as each respondent evaluated four furniture pieces.

<sup>b</sup>(+) = higher than expected frequency in the cell; (-) = lower than expected frequency.

confirmed by this study. Gender was not significant overall, suggesting that previous findings of differences by gender in the *perceptions* associated with species do not necessarily translate into actual species *preference*. However, a few gender differences were noted when considering age and income. Nicholls and Roos (2006) also found no gender differences in preferences for red alder cabinets stained to different shades, although only one species was investigated.

**Table 2** shows results for species preferences for gender by age, and **Table 3** shows results for gender by income. Not surprisingly, given no overall gender effect, similar trends for age and income held for both males and females. However there were a few notable exceptions. Maple was preferred by younger males, which along with a preference for spruce could indicate a general preference for lighter colored woods by younger males. Birch, along with oak, was preferred by

lower income males. Lastly, alder had a lower preference among higher income females, suggesting a lack of status position for this species.

Demographic differences in species preferences for the four furniture pieces we considered can be summarized as follows. Age and income both were statistically significant, with a stronger effect for age. The income effect was quite weak, and statistical significance likely was influenced by the large sample size.

Gender was not statistically significant.

Spruce was more preferred by younger respondents and less preferred by older respondents.

Oak was more popular among older respondents and less popular among younger respondents.

Oak also was more preferred by lower income respondents.

Cherry was more preferred by higher income respondents and less preferred by lower income respondents.

Red alder was less popular among higher income female respondents.

Maple was preferred by younger male respondents; birch was preferred by lower income male respondents.

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