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.

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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ucts, there is potential for using other species in office furni-

ture (Smith et al. 2005).

Among western hardwoods, red alder (Alnus rubra Bong.)
has become a major species used to produce a variety of fur-

niture 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 manu-
facturers better utilize the species available to them, particu-
larly 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 stud-
ies. This work is based on a broader study which also consid-
ered the effects of pricing and species information on con-
sumer preferences for wood use in furniture (Bumgardner et
al. 2007). For this technical note we identify possible demo-
graphic segments to target for marketing various wood spe-
cies. Our research questions included:

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

For a given age category, how do male and female respon-
dents differ?

For a given income category, how do male and female re-
dents 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 pro-
vided responses.

Respondents visiting the booth indicated which of six spe-
cies 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, tex-
ture, or grain patterns. Scale was indicated by including com-
mon household items as part of the drawings. The question
used for evaluation was, “If you were to purchase this [furni-
ture 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 loca-
tions only. Past research has shown that respondents at events
such as these tend to be older and wealthier than the popula-
tion at large (Nicholls et al. 2004).

Furniture piece and species selection

Four furniture pieces were evaluated in this study: an enter-
tainment 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 sev-
eral 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 re-
pondents 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 sta-

tistics, Cramer V statistics, and cell chi-square values were
calculated.

Results and discussion

Table 1 presents overall results for species preferences by
genre, 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 Cra-
mer’s V statistic). Spruce was preferred by younger consum-
ers, 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 spe-
cies preference, and that oak’s niche is with older, lower in-
come 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.

<table>
<thead>
<tr>
<th>Category</th>
<th>$\chi^2$</th>
<th>Sig.</th>
<th>N</th>
<th>Cramer V</th>
<th>Level</th>
<th>Cell results</th>
<th>Cell values</th>
</tr>
</thead>
<tbody>
<tr>
<td>gender</td>
<td>6.58(5)</td>
<td>0.25</td>
<td>4300</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>age</td>
<td>139.53(10)</td>
<td>&lt;0.01</td>
<td>4396</td>
<td>0.13</td>
<td>18 to 40 years</td>
<td>oak (−)</td>
<td>49.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>41 to 50 years</td>
<td>spruce (+)</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>51 + years</td>
<td>oak (+)</td>
<td>25.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>spruce (−)</td>
<td>--</td>
<td>18.0</td>
</tr>
<tr>
<td>income</td>
<td>36.27(10)</td>
<td>&lt;0.01</td>
<td>3996</td>
<td>0.07</td>
<td>$50K or less</td>
<td>cherry (−)</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$51K to $100K</td>
<td>oak (+)</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt;$100K</td>
<td>cherry (+)</td>
<td>6.6</td>
</tr>
</tbody>
</table>

*This reflects number of respondents 4x, as each respondent evaluated four furniture pieces. 
$^b(+) = \text{higher than expected frequency in the cell; } (−) = \text{lower than expected frequency.}$

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

<table>
<thead>
<tr>
<th>Category</th>
<th>$\chi^2$</th>
<th>Sig.</th>
<th>N</th>
<th>Cramer V</th>
<th>Level</th>
<th>Cell results</th>
<th>Cell values</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>63.80(10)</td>
<td>&lt;0.01</td>
<td>1921</td>
<td>0.13</td>
<td>18 to 40 years</td>
<td>oak (−)</td>
<td>17.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>41 to 50 years</td>
<td>spruce (+)</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>maple (+)</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>51 + years</td>
<td>oak (+)</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>spruce (−)</td>
<td>6.9</td>
<td></td>
</tr>
<tr>
<td>female</td>
<td>89.35(10)</td>
<td>&lt;0.01</td>
<td>2363</td>
<td>0.14</td>
<td>18 to 40 years</td>
<td>oak (−)</td>
<td>29.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>spruce (+)</td>
<td>19.5</td>
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<td></td>
<td></td>
<td></td>
<td>41 to 50 years</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>51 + years</td>
<td>spruce (−)</td>
<td>10.7</td>
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<td></td>
<td></td>
<td></td>
<td>oak (+)</td>
<td>8.2</td>
<td></td>
</tr>
</tbody>
</table>

*This reflects number of respondents 4x, as each respondent evaluated four furniture pieces. 
$^b(+) = \text{higher than expected frequency in the cell; } (−) = \text{lower than expected frequency.}$

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

<table>
<thead>
<tr>
<th>Category</th>
<th>$\chi^2$</th>
<th>Sig.</th>
<th>N</th>
<th>Cramer V</th>
<th>Level</th>
<th>Cell results</th>
<th>Cell values</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>22.46(10)</td>
<td>0.01</td>
<td>1825</td>
<td>0.08</td>
<td>$50K or less</td>
<td>cherry (−)</td>
<td>3.3</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>oak (+)</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>birch (+)</td>
<td>2.4</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>$51K to $100K</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt;$100K</td>
<td>oak (−)</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>cherry (+)</td>
<td>3.9</td>
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<td></td>
<td></td>
<td></td>
<td>$50K or less</td>
<td>cherry (−)</td>
<td>7.6</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>oak (+)</td>
<td>4.1</td>
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<td></td>
<td></td>
<td>$51K to $100K</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt;$100K</td>
<td>cherry (+)</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>red alder (−)</td>
<td>3.1</td>
<td></td>
</tr>
</tbody>
</table>

*This reflects number of respondents 4x, as each respondent evaluated four furniture pieces. 
$^b(+) = \text{higher than expected frequency in the cell; } (−) = \text{lower than expected frequency.}$

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.

Literature cited