

Love It or Leave It: What Do Millennials Really Think of Wood Products?

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Abstract

In the past, the wood products industry has often struggled with effectively marketing products to the public. With the increase of globalization and wood substitutions, the industry may need new ways to attract customers. Targeting younger customers who have recently joined the buyer's market may be a way to increase the industry's market share and customer base. A study was conducted to understand the millennial generation's (individuals born from 1980 to 2000) knowledge and perception of wood products. In 2018, an online survey was distributed to over 1,500 millennial-aged individuals and 1,479 usable survey responses were returned. Results indicate that respondents have a favorable perception of wood products and that there is potential to change uncertain or negative perceptions by providing informative facts about wood products. Approximately 71 percent of millennials indicated paper and pulp to be the most popular wood product, followed by lumber (51%). Responses also showed that 84 percent of respondents perceived wood as beautiful and 54 percent indicated it appealed to their sense of style. In terms of strength and durability, 46 percent of the respondents did not perceive wood to be as strong as steel. They were unaware of cross-laminated timber (74%) and its structural benefits and did not feel it was a safe product to use in tall buildings (54%). Millennial females and all millennials ages 18–20 held particularly stronger attitudes about wood products. The information gained from this research can be valuable when developing strategies to promote products and attract new customers.

In 2019, the millennial generation, also known as *Generation Y* and most frequently called *millennials* overtook the baby boomers to become the biggest generation in the US workforce and consumer market (Fry 2020). The millennial generation is typically comprised of individuals born from the early 1980s to late 1990s/early 2000s. However, there is no current unified age range agreed upon by scholars that defines the millennial generation. Age range estimates date from 1979 to 1994, 1982 to 2004, or 1980 to 2000 (Levenson 2010, Myers and Sadaghiani 2010, Hartman and McCambridge 2011, Raphelson 2014, DeVaney 2015, Holmberg-Wright et al. 2017, Fry 2018, Dimock 2019).

Millennials are frequently characterized quite differently from previous generations and are often labeled *Generation Me* (Twenge 2006). Adjectives used to describe them have ranged from open-minded, social, innovative, energetic, and ambitious to hedonistic, extravagant, fickle, lazy, shallow, and selfish (Stein 2013, Ordun 2015, Lissitsa and Kol 2016). Millennials also are considered to be brand-loyal, socially conscious, and advocates for the environment (DeVaney 2015, Pew Research Center 2015, Stout et al. 2020).

These unique characteristics also affect lifestyle and purchasing decisions. Generations have different experiences, which influence their values, preferences, and shopping behavior (Parment 2013). Research shows that three different effects produce differences in attitudes and behaviors between various age groups: life cycle effects, period effects, and cohort effects. Life cycle effects are those generational differences that are due to a person's position along the life cycle and are likely to change as the person progresses through the life cycle. For example, a

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person's attitude toward voting is likely to change as they get older. A period effect is a generational difference that is the result of an event, circumstance, or social force that shapes attitudes and behaviors of the entire population, regardless of age. Period effects are believed to have lasting effects and do not change as individuals get older. For example, the feminist movement influenced how people of all ages viewed women's roles in the workplace. Ten years from now, these views are likely to be the same. Cohort effects are differences between generations that are a result of historical circumstances that members of an age group may experience. Due to the current issue of climate change, younger generations may hold different views and opinions on sustainability and environmental protections compared to older generations.

Previously, the baby boomer generation had been the driving force of the economy (Ordun 2015). However, as the boomers got older and more and more millennials entered the workforce millennials have become a major driving force of the economy.

At the beginning of 2020, millennials were projected to spend US\$1.4 trillion (5W Public Relations 2020). US millennial women account for 85 percent of the total buying power of all US millennials (Merkle and Lavo 2018). In addition, research has shown that because of their consumer power and opinion leader influence within many families, they are an important target market (Silverstein and Sayre 2009, Fromm and Garton 2013, Brennan 2018). Significant consumer research has been conducted to determine millennials' purchasing attitudes, buyer behavior, and adoption of new products and how their behaviors differ from older generations (Ordun 2015). However, little is known about their perceptions and attitudes toward a product that they more than likely use every day: wood.

The US wood products industry is an important contributor to the economy, accounting for approximately 4 percent of the total US manufacturing gross domestic product (Forth 2018). In 47 states, wood products companies are among the top 10 manufacturing sector employers, producing over US\$210 billion in products annually. However, according to recent studies, consumers have limited knowledge and understanding of the industry and some of the products produced (Gazal et. al 2019, Stout et al. 2020). Also, steel, concrete, and other building materials are abundant, and according to Mayo (2015) wood often is viewed as outdated and inadequate for building. Due to the vast buying power that millennials possess (5W Public Relations 2020, Munsch 2021) as they reach their peak earning and spending years and the fact that millennials grew up during the age of environmental awareness, it is important to understand how their unique characteristics and perceptions may affect their purchasing of wood products.

To the authors' knowledge, there have been no other studies conducted on the millennial generation and their attitudes and perceptions toward wood products. The authors were particularly interested in understanding millennials' attitudes and perceptions toward cross-laminated timber (CLT), an innovative wood product that is new to US markets. CLT is a quasi-rigid composite, plate-like engineered timber product, which is commonly composed of an uneven number of layers (usually three, five, or seven layers), each made of boards placed side by side, which are arranged crosswise to each other at an angle of 90°, capable

of bearing loads in- and out-of-plane (Brandner et al. 2016). CLT production has many economic, environmental, structural, and safety benefits and could have a big impact on the US construction industry in the future (Pierobon et al. 2019).

There have been studies to examine architects' and engineers' awareness, perceptions, and willingness to adopt CLT. Researchers developed these studies for professionals with expertise and knowledge of building materials and structures. However, to the authors' knowledge, there has been no research that has focused on consumers and individuals that do not have expertise or prior knowledge in this area. Research shows that product adoption and demand is dependent on potential adopters' perceptions of the product and its attributes (Armstrong and Kotler 2013). In addition, product awareness is a key component of the adoption process (Koebel et al. 2003).

This article is a part of a two-part series. This is part two of the series and will focus on the wood products section of the questionnaire. The objectives of the first part were to determine the level of knowledge millennials possessed regarding the wood products industry and whether millennials held negative or positive views toward the industry in terms of its practices and relationship with the environment.

The objectives of this study were to (1) determine how much knowledge millennials have of wood products, (2) understand their perceptions and attitudes toward the aesthetic and physical properties of wood, (3) understand their perceptions of wood as a consumer product, and (4) understand their knowledge and perceptions of CLT as a building material for tall buildings. Information gathered from this research may be beneficial to the industry in developing strategies to disseminate information on innovative products, such as CLT. The data also may provide insight for the industry in how to best reach millennials and enhance relations with them and subsequent generations.

Methodologies

Questionnaire

The questionnaire consisted of 40 questions. The questions were in multiple formats including multiple choice, five-point rating scale, open-ended, and categorical (ranking). Demographics, including age, education level, race/ethnicity, and state of residence, made up 7 of the 40 questions. The age question was critical, given our focus on millennials. The age range chosen to define the millennial generation herein consist of those aged 18 to 38 in 2018 (born 1980 through 2000). In addition, questions were provided regarding respondents' self-perception of their own generation and respondent use of social media applications.

The remaining questions focused on the wood products industry and wood products. Industry-specific questions requested respondents' opinions regarding topics such as general knowledge, industry reputation/credibility, and the industry's relationship with the environment. Product-specific questions requested respondents' opinions on wood product characteristics, styles, and durability. Specific questions related to CLT were also asked in this section. Every question was formatted according to Dillman's tailored design method (Dillman et al. 2014).

Before the questionnaire was distributed, it was tested with a small number of people from the desired sample

population before mass distribution (Dillman et al. 2014). Pretesting of questionnaires is a recommended method to resolve previously undetected issues and to reduce measurement errors with questions before full testing begins (Dillman et al. 2014).

The pretest occurred with the aid of the panel sample company Research Now SSI. The requirements for the pretest follow those previously described: the age range was set from 18 to 38 years old; all other demographics were random, and it was national. The pretest was conducted in the spring of 2018. Feedback was collected from respondent comments in the open-ended box at the end of the questionnaire. There were 184 responses collected. Of those 184 responses, 40 were discarded because those respondents did not fall in the age range or did not complete the questionnaire. Thus, the pretest yielded 144 usable responses.

Based on the comments provided in the open-ended box by the respondents, two questions were altered to ease the answer process. In one case a question was altered to reduce the number of answer choices, while in the other case the format of the question was changed. For the question that had its format changed, the 144 usable pretest responses were withheld from final data analysis.

This publication focuses solely on the wood products section of the questionnaire.

Data collection

An online survey was conducted nationally in the United States by Research Now Survey Sampling International (SSI),¹ a company providing data collection services for marketing research studies. Research Now SSI serves both large and small businesses, colleges/universities, healthcare providers, market research agencies, and other advertising-related agencies (Research Now SSI 2018a).

Research Now SSI uses panel-based sampling to identify respondents for surveys. The panels are comprised of people who have voluntarily agreed to take the survey and provide answers. The panel to which each survey is distributed depends upon the clients' study requirements. The number of responses requested plus specific demographics constitute some of the possible study/panel requirements. Survey respondents are allowed only a one-time, single response, and when the total number of needed responses is met, the survey is closed.

In order for Research Now SSI to provide a sample reflective of the target population, they use multiple quality-control techniques, including the following:

a three-stage randomization process in matching a participant with a survey they are likely to be able to complete. First, participants are randomly selected from SSI's panels to be invited to take a survey, and these participants are combined with others entering SSI's Dynamix™ sampling platform after responding to online messaging. A set of profiling questions is randomly selected for them to answer (these are methodologically correct questions, never affirmation questions) and upon completion, participants are matched with a survey they

are likely to be able to take, using a further element of randomization (Research Now SSI 2018d).

Other examples of quality control measures include "digital fingerprinting that flags duplicate respondents" and "pattern recognition software [that] identifies fraudulent respondents" (Research Now SSI 2018b, 2018c). In addition, SSI "works to optimally blend proprietary sample sources by conducting comparability tests and modeling the blend that will achieve the closest match to census and social benchmarks" (Research Now SSI 2018).

Methods of surveying populations using the internet have evolved because of increasing demand. The methods Research Now SSI has implemented to ensure data quality are aligned with those described by Baker et al. (2010). An increasing number of industries have begun to rely on online panel services for research purposes. According to Callagaro et al. (2014), online surveys have become the leading approach for conducting market research. Reasons for this increase relate to lower costs, faster response time, higher levels of response than with other methods, and issues regarding the reach of different modes (Baker et al. 2010). The value of online panel sampling also goes beyond lower costs and quicker response times. There is evidence of a reduction in measurement error in online surveys versus other modes (Farrell and Petersen 2010).

Sample collection

The only sampling criterion for this study was a specific age range of those born from 1980 to 2000. All other demographics were random. Research Now SSI distributed the survey to a random sample of individuals from an online panel. The target number of responses was 1,500 and responses were collected until the target number was met. The pretest responses were included in the total target of 1,500. Testing for the first wave occurred in March 2018.

The first wave produced 1,234 usable completes, including the 144 usable pretest responses. A second wave was launched in an attempt to attain the 1,500 responses goal. The second wave occurred in April 2018. The second wave resulted in 101 usable responses. The overall total number of responses from both waves was 1,818. However, approximately 339 responses were removed because those respondents did not fall in the age range or did not complete the questionnaire. This filtration resulted in a total of 1,479 usable responses.

Bias potential

Given our use of an online panel company to distribute the survey, measuring nonresponse bias can be a potential issue (Sharp et al. 2011). However, as this study had two "waves" of responses, nonresponse bias was tested by comparing the early versus late responses. Although similar online studies do not test for nonresponse bias, other studies have used this approach in calculating nonresponse bias whereby the number of nonrespondents is unknown (Aguilar and Cai 2010, Lesser et al. 2011, Montague et al. 2016, Bumgardner et al. 2007). The authors wanted to ensure all bias was accounted for and decided to use this method as well.

Two questions were tested for bias. The first asked respondents if they had heard of the wood products industry before taking this survey (binary response variable with levels of "yes" or "no"). The second question asked

¹ The use of trade, firm, or show names in this publication is for reader information and does not imply endorsement by the US Department of Agriculture of any product or service.

respondents if their original perceptions of CLT changed after being presented with more information regarding its safety. The Kolmogorov-Smirnov test (K-S test) statistic was calculated to compare early versus late responses for both questions. The K-S statistic indicated the samples (no. 1 K-S = 0.99, no. 2 K-S = 0.97) came from the same distribution, meaning respondents who completed the survey later were not statistically different from those who completed it early.

Data analysis measures

Descriptive statistics such as frequencies, means, and modes were calculated for all the questions. Further analyses included parametric tests performed on yes-or-no, multiple choice, and all the five-point rating scale questions. For the first part of this research, the Kruskal-Wallis nonparametric, rank-based test was used to assess the likelihood that the distributions of responses to questions that used the five-point scale were similar for different groups of respondents (based on age group, gender, education, race, etc.). For this portion, only descriptive statistics were used to analyze the data collected.

Study limitations

There are limitations to our work that are similar to other research using online surveys. Although panel surveys can be administered quickly and are usually cost efficient, there are some disadvantages. Because results were obtained from an established panel, the responses may not necessarily reflect those of other US consumers as recent studies based on online surveys have acknowledged biases toward “younger age, white, non-Hispanic ethnicity, literate, non-visually impaired, and persons with low time costs” (Craig et al. 2013).

Results and Discussion

Demographics

The demographic breakdown from the usable surveys revealed 54 percent of respondents were female ($n = 796$) and 46 percent were male ($n = 672$). The gender makeup for this study was similar to the entire United States with 51 percent female and 49 percent male (Howden and Meyer 2011, US Census Bureau 2010). The majority of respondents live in the South (35%) and Midwest (23%) while 22 percent were from the West and 20 percent were from the Northeast. In terms of race/ethnicity, 79 percent of the respondents identified as Caucasian (white), 10 percent as African American, 8 percent as Asian, and 2 percent as Other. The racial makeup of this study is on par with the 2010 US Census that reported 78 percent Caucasian, 13 percent African American, and 5 percent Asian (US Census Bureau 2010).

The current level of education completed by respondents indicated 39 percent held college/advanced degrees, 26 percent held a high school degree or less, 22 percent had some college (no degree), and 13 percent held technical/associates degrees. The educational attainment was similar to that of the entire United States, where 31 percent hold college/advanced degrees, 29 percent hold high school degrees, 19 percent have some college (no degree), and 10 percent hold associate degrees (US Census Bureau 2017). Perhaps most important, there was a relatively equal turnout among age groups of survey respondents, as seen in Table 1.

Table 1.—Percentage of survey respondents by age group.^a

Age group	%
18–20	9
21–23	10
24–26	14
27–29	17
30–32	18
33–35	18
36–38	14

^a Percentage values are rounded to the nearest whole number.

General wood products

To gauge general perceptions toward wood products, respondents were given a list of wood products and asked to select the first word that came to mind when they heard or saw the phrase *wood products*. The top three words that came to millennials first were trees (33%), lumber (25%), and paper (17%). The full list of options provided to respondents is illustrated in Figure 1.

In a separate question, millennials were asked to rank 10 different wood products in terms of perceived popularity. Seventy-one percent of respondents indicated paper and pulp to be the most popular product, followed by lumber at 51 percent. Composites and fuelwood were ranked last with 0.5 and 0.4 percent, respectively.

A list of statements was provided to the respondents to determine how wood products appeal to current millennial consumers. Approximately, 78 percent agreed (assigned value of 4 or 5) wood products will always have a presence in the consumer market (Table 2). Millennials ages 30 to 38 were most likely to strongly agree with that statement compared to respondents ages 18 to 20. Females were more likely to strongly agree and all millennials with a college/advanced degree were more likely to agree that wood products will always have a presence in the consumer market.

Approximately, 75 percent (4 and 5 value) of millennials agreed that wood products are popular among consumers (Table 2). Females were more likely to strongly agree and millennials ages 33 to 35 were more likely to agree that wood products are popular among consumers. Millennials with some college, but no degree, were more likely to strongly agree with that statement as well. While most respondents were likely to agree with wood products having a place in the market and being popular among consumers, it is interesting to note that they had more neutral responses when asked about purchasing wood products in the future and whether they preferred wood furniture (Table 2).

Wood products' appeal

To further understand millennial perceptions and attitudes towards wood products, respondents were provided with statements centered on four main themes. The four themes were environmental impact, physical properties, physical appearance, and durability. Respondents were asked to evaluate each statement using a five-point scale where 5 = strongly agree and 1 = strongly disagree.

When asked about the environmental impact of wood products, 64 percent of millennials agreed (4 and 5) that they do not like to see trees cut down (Table 3). Millennial females were more likely to strongly agree with that statement than males. Sixty percent of millennials agreed (4

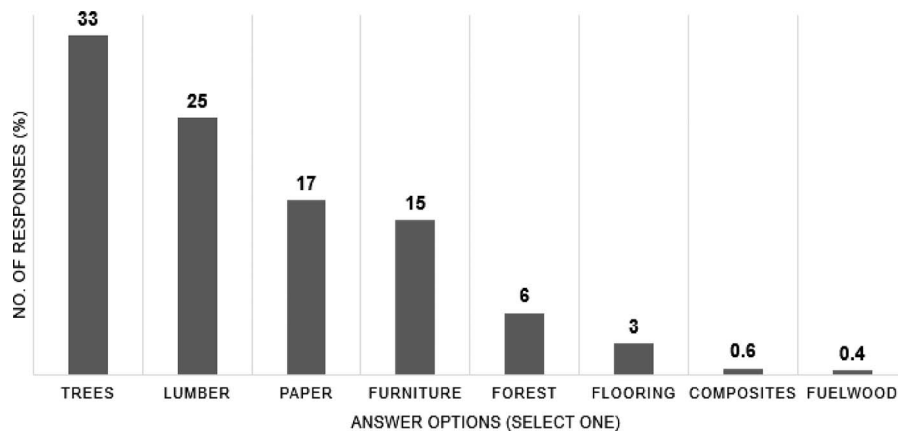


Figure 1.—Millennials' perception toward hearing the phrase "wood products." Percentage values are rounded to the nearest whole number.

and 5) that wood is a sustainable resource. Millennial males were more likely to strongly agree with that statement. All millennials ages 33 to 35 and all millennials with a technical/associates degree were more likely to agree that wood is a sustainable resource.

A little less than half of millennials (42%) held a neutral attitude (3) toward the statement "wood is a better quality product with which to build as compared to concrete or steel." Millennials ages 18 to 20 were more likely to disagree and all millennials with a college/advanced degree were more likely to agree with that statement. A reason for these responses may be that those with higher education are more informed regarding the benefits of building with wood. Younger millennials (ages 18 to 20) were also more likely to disagree with that statement, indicating they may not possess an understanding of the advantages of wood structures.

Finally, 46 percent of millennials disagreed (1 or 2) that wood products should not be built or used. All millennials ages 33 to 35 were more likely to strongly disagree with that statement. Millennial females and all respondents who identified as Caucasian were more likely to disagree with that statement.

The majority of millennials (64%) in this study indicated that they "do not like to see trees cut down." Females in particular were more likely to strongly agree with that statement. Surprisingly, millennial females were more likely to disagree with "wood products should not be used" yet were more likely to strongly agree with the statement "I do not like to see trees cut down." The strong agreement toward the statement "I do not like to see trees cut down" may be a cohort effect and a result of climate change issues

experienced throughout this generation's lifetime. According to Parment (2013), environmental events experienced during one's coming of age create values that remain relatively unchanged throughout life. While the respondents understand or believe that wood products "should be used," there is still a strong reaction to seeing felled trees that may be attributed to life experiences.

The second theme focused on the physical properties of wood products (Table 4). Over half of millennials (66%, 4 and 5 values) agreed that wood burns faster than steel melts. All millennial females held neutral attitudes and all millennials with college/advanced degrees were more likely to strongly agree with that statement.

Approximately, 65 percent of millennials agreed preservatives help to prevent wood decay. Females were most likely to agree with that statement. All millennials with some college/no degree were more likely to agree with that statement compared to all of those with a high school degree. In comparison, less than half of millennials (41%) agreed that treated wood poses only a minimal risk to human health (Table 4). Millennial females and all millennials with a high school degree were more likely to answer neutral (3) for that statement.

Millennial females were also more likely to agree that preservatives help prevent wood decay. Yet, females held neutral attitudes regarding whether treated wood poses a minimal risk to human health or not. A reason for this may be due to a lack of knowledge regarding treated wood and its relation to human health. Research shows that neutral responses on questionnaires are often selected when respondents are not knowledgeable on the subject (Knauper 1999, Krosnick et al. 2002).

Table 2.—Millennials' attitude toward general wood products topics.^a

Statement	Mean (mode)	% assigning a rating of				
		5 (strongly agree)	4	3	2	1 (strongly disagree)
I believe wood products will always have a place in the consumer market	4.1 (4)	37	41	16	4	2
I believe wood products are popular among consumers	4.0 (4)	32	43	19	4	2
I will most likely buy wood products in the future	3.9 (4)	29	37	26	5	3
I prefer wood-based furniture such as dressers, bed frames, etc.	3.8 (4)	30	32	28	7	3

^a Values are rounded to the nearest tenth and are based on a five-point scale where 5 = strongly agree and 1 = strongly disagree. Percentages are rounded to the nearest whole number.

Table 3.—Millennials' attitude regarding the environmental impact of wood products.^a

Statement	Mean (mode)	% assigning a rating of				
		5 (strongly agree)	4	3	2	1 (strongly disagree)
I do not like to see trees cut down	3.8 (4)	31	33	24	8	4
Wood is a sustainable resource	3.6 (4)	22	38	26	10	4
We should not use wood products to construct tall buildings	3.6 (3)	23	29	35	9	4
Compared to other building materials, wood structures are environmentally friendly	3.5 (3)	17	33	38	9	3
Wood is a better quality product with which to build as compared to concrete or steel	3.3 (3)	12	26	42	16	4
Using wood products is environmentally friendly	3.2 (3)	13	28	34	19	6
Wood products should not be built or used	2.6 (3)	7	14	33	27	19

^a Values are rounded to the nearest tenth and are based on a five-point scale where 5 = strongly agree and 1 = strongly disagree. Percentages are rounded to the nearest whole number.

Approximately 46 percent of millennials disagreed with the statement that “overall, I think wood is stronger than steel.” Millennial females were more likely to disagree with that statement. Also, all millennials with a high school degree (37%) held neutral attitudes towards that statement compared to those with a college/advanced degree (24%). Individuals that have some knowledge of wood types and characteristics typically understand that strength is dependent on the size, type, and physical properties of the wood. The responses provided for this statement suggests a lack of knowledge among millennials in terms of wood types and characteristics.

There is evidence of a need for improved education and awareness regarding the sustainability and safety of wood products. Results in Table 4 indicate millennials possessed a weak working knowledge of a variety of wood properties. Educational topics involving the rate at which wood burns in different situations as well as the safety associated with wood treatments may be beneficial to promote to the public. In addition, it may be beneficial to enhance millennial understanding of basic wood attributes regarding strength, load bearing capabilities, and environmental building benefits. As millennials are a more environmentally conscious group, informing them on these attributes could help to improve industry relations (Osburg et al. 2016).

Potential methods to educate millennials about wood properties may be through targeted campaigns ranging from traditional paper and ink to modern social media strategies. Each campaign would depend upon the desired goal. While focusing on the environmental aspect is important, the industry may consider posting educational facts about wood on the packaging of products sold to consumers (Osburg et al. 2016). This may be a subtle approach to educate the public on what material the product is made of and its associated properties.

The third theme related to the physical appearance or attractiveness of wood products (Table 5). Most millennials (82%, 4 or 5 values) agreed they find wood products to be beautiful. In particular, females were more likely to strongly agree and all millennials with a college/advanced degree or some college/no degree were more likely to strongly agree with that statement.

Over half (54%) of millennials disagreed with the statement “wood products do not appeal to my style taste” (Table 5). Millennial females were most likely to strongly disagree with that statement. Over half of millennials (54%) indicated wood products appeal to their style taste. A possible reason for millennial females indicating it appeals to their style may stem from the popularity of the country chic, shabby chic, or rustic interior design trends (American Society of Interior Design 2014; Lerner 2016). The emergence of influential TV shows such as “Fixer Upper” on HGTV and other home renovation shows may also be a factor.

Similarly, over half (52%) of millennials disagreed that wood products look outdated. Again, females (30%) were more likely to strongly disagree with the statement versus males (17%). All respondents who identified as Caucasian were more likely to strongly disagree that wood products look outdated. However, millennials with some college/no degree were more likely to strongly disagree that wood products look outdated. Millennial females were, again, more likely to strongly disagree with that statement, perhaps because of interior design preferences.

As for the physical appearance of wood furniture or other products, millennials find it appealed to their style taste (Table 5). The focus on the appearance of wood products, such as hardwood floors, ties into millennial self-perceptions and values as a generation. Millennials emphasize the importance of their image and reputation beyond that of

Table 4.—Millennials' attitude toward physical properties of wood products.^a

Statement	Mean (mode)	% assigning a rating of				
		5 (strongly agree)	4	3	2	1 (strongly disagree)
Wood burns faster than steel melts	3.9 (4)	36	30	27	4	3
Preservatives help to prevent wood decay	3.8 (4)	21	44	30	4	1
Wood is a reliable product to use as a building material	3.6 (4)	17	40	29	10	3
Treated wood poses only a minimal risk to human health	3.4 (3)	13	27	44	12	3
Natural wood is decay resistant	2.9 (3)	8	19	38	23	12
Overall, I think wood is stronger than steel	2.7 (3)	9	16	30	23	23

^a Values are rounded to the nearest tenth and are based on a five-point scale where 5 = strongly agree and 1 = strongly disagree. Percentages are rounded to the nearest whole number.

Table 5.—Millennials' attitude toward the physical appearance of wood products.^a

Statement	Mean (mode)	% assigning a rating of				
		5 (strongly agree)	4	3	2	1 (strongly disagree)
Wood products are beautiful	4.2 (5)	49	32	14	3	2
I like the look of hardwood floors	4.2 (5)	47	32	16	3	1
I like the natural grain appearance of wood products	4.1 (5)	42	33	19	4	1
Hardwood floors increase the value of the home	4.0 (5)	38	33	22	5	2
I prefer kitchen cabinets to show the natural wood grain	3.7 (3)	26	32	32	7	2
I like the appearance of wood countertops (such as Butcher Block)	3.6 (3)	23	30	31	12	4
I prefer kitchen cabinets to be painted to hide the natural grain	2.9 (3)	12	19	32	18	18
I think wood products look outdated	2.6 (2)	8	17	22	28	24
Wood products <i>do not</i> appeal to my style taste	2.5 (1)	8	14	24	25	29

^a Values are rounded to the nearest tenth and are based on a five-point scale where 5 = strongly agree and 1 = strongly disagree. Percentages are rounded to the nearest whole number.

previous generations; this higher level of self-consciousness for how others perceive them may affect how millennials purchase products (Noble et al. 2009; Parment 2013).

The final theme included statements regarding the durability of wood products. Approximately, 75 percent of millennials agreed overall with the statement “hardwood floors are durable” (Table 6). Millennial females were more likely to strongly agree and millennials with a high school degree were most likely to answer neutral (3). Also, millennials ages 33 to 35 were more likely to strongly agree with that statement.

Over half of millennials (73%) agreed that hardwood floors contain fewer allergens than carpet (Table 6). Millennials ages 33 to 35 were more likely to strongly agree with that statement versus millennials ages 18 to 20. All millennials with a high school degree held neutral attitudes towards the statement. Also, all females were more likely to strongly agree than males with that statement.

Delving further into millennial attitudes toward flooring, 68 percent agreed they prefer hardwood to carpeted floors. Millennial females were more likely to strongly agree with preferring hardwood floors over carpet. All millennials with a high school degree held neutral attitudes toward that statement.

Cross-laminated timber

There is increasing interest in finding applications for CLT, which is considered a new product in the United States. To understand how millennials would react to this new wood product, respondents were asked questions solely regarding CLT use in construction. Approximately 16 percent of millennials said they had heard of CLT before

this survey (Fig. 2). In terms of age, millennials ages 24 to 32 and males were more likely to say they had heard of CLT.

After determining current millennial awareness of CLT, respondents were asked two rounds of Likert-type questions to test if perceptions could be changed regarding CLT safety. Before respondents were asked to answer the first round of questions, they were provided a basic definition of CLT. This definition remained on the page as they considered the statements, shown in Table 7. Millennials were asked to indicate how safe or unsafe they would feel in four types of CLT-constructed buildings (entire building made of CLT, 3-story CLT building, 12-story CLT building, and building made of CLT and traditional building materials).

Half of millennials (50%) said they would feel safe in an entire building made of CLT. Millennial males were more likely to say they would feel very safe in an entire building made of CLT. All millennials with a high school degree held neutral attitudes toward that statement.

However, when the height of the CLT building was given in detail, millennial attitudes on CLT safety performance shifted. Approximately, 46 percent said they would feel safe in a three-story CLT building. Millennial males were more likely to say they felt very safe and all respondents with a high school degree were more likely to answer neutral (3) for that statement. Millennials who identified as Caucasian or Asian were also more likely to say they would feel safe in a three-story CLT building.

Approximately 30 percent of millennials indicated they would feel unsafe in a 12-story CLT building. Again, millennial males were most likely to say they would feel

Table 6.—Millennials' attitude towards the durability of wood products.^a

Statement	Mean (mode)	% assigning a rating of				
		5 (strongly agree)	4	3	2	1 (strongly disagree)
Hardwood floors are durable	4.0 (4)	36	39	18	5	2
Hardwood floors have less allergens than carpet	4.1 (5)	42	31	22	4	1
Hardwood floors last longer than carpet floors	4.0 (5)	39	32	22	5	2
I prefer hardwood floors to carpeted floors	3.9 (5)	38	29	22	8	3
Wood countertops (such as Butcher Block) are durable	3.8 (4)	28	35	30	6	2
Wood furniture lasts longer than metal or plastic furniture	3.6 (3)	24	30	34	9	3
Wood countertops (such as Butcher Block) are difficult to clean	3.3 (3)	14	30	37	14	5

^a Values are rounded to the nearest tenth and are based on a five-point scale where 5 = strongly agree and 1 = strongly disagree. Percentages are rounded to the nearest whole number.

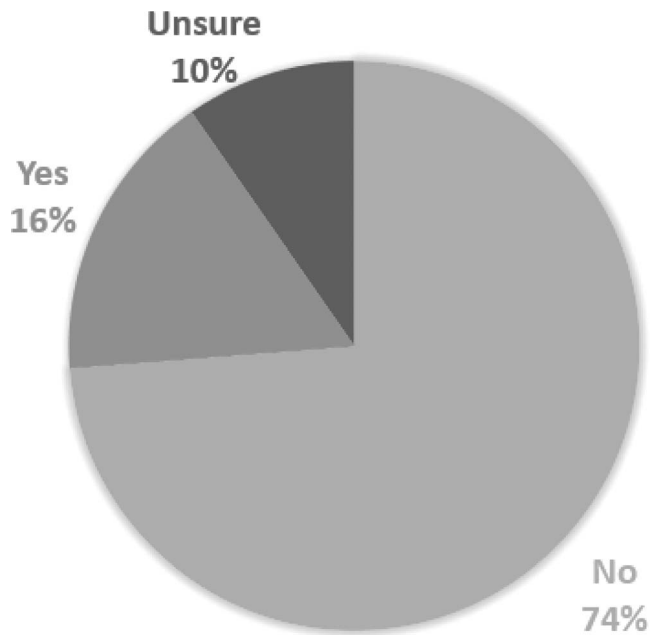


Figure 2.—Millennials' prior knowledge of cross-laminated timber. N = 1474. Percentage values are rounded to the nearest whole number.

safe in a 12-story building. All millennials with a high school degree held neutral attitudes toward this statement.

After considering Round 1 of the statements, millennials were then provided additional information regarding CLT. Respondents were provided with a definition and description of CLT and information about CLT's fire and decay resistance. Following this information, respondents were asked if learning this additional information changed their original perceptions of CLT. Sixty-seven percent of millennials said their perceptions were changed. Only the 67 percent who answered "yes" were directed to the second round of Likert-type questions. The format of the second round of questions was exactly the same as the first. The same four statements were shown for millennials to consider.

Over half of millennials who answered Round 2 said they would feel safe in every CLT building described in the four statements (Table 7). Millennials shifted to answer more positively in the second round versus the first round of statements. There were 77 percent of respondents who said they would feel safe in a three-story CLT building, a 31

percent increase from the same statement in Round 1 (46%, Table 7). Millennials ages 24 to 26 and ages 36 to 38 were more likely to say they would feel very safe in a three-story CLT building versus ages 21 to 23. Similarly, regarding safety in a 12-story CLT building, millennials ages 33 to 38 were more likely to say they would feel safe versus ages 21 to 23.

Comparing Rounds 1 and 2 of the CLT questions, there was a change in millennial perception after additional information was provided. Millennials were more likely to indicate they felt safer in Round 2 compared to Round 1, as seen in Figure 3.

The results in Figure 3 indicate there is potential to change uncertain or negative perceptions with informative facts about wood products. In terms of the marketability of CLT, 64 percent of millennials said they thought this product would have a place in the US residential and commercial construction market. Males were more likely to answer "no" to CLT having a place in the US market. Yet, all millennials with college/advanced degrees (72%) were more likely to answer "yes" to CLT having a place in the US market compared to those with a high school degree (54%).

Finally, respondents were asked to answer an open-ended question regarding the future use of CLT in building construction in the United States. There were hundreds of comments left ranging from "I think HGTV should feature it" to "the information makes CLT sound very appealing as an alternative to traditional building materials." Many comments expressed a desire to know more about CLT. In particular, they wanted information regarding material pricing, durability, longevity, and environmental friendliness. Showing interest in cost effectiveness is not surprising as millennials are faced with certain financial burdens such as student loans. Thus, products that are effectively priced may hold more value to millennials.

The industry has an opportunity to improve the awareness of CLT as a product and aid in shaping positive perception toward the product. Regarding the 16 percent of respondents who knew about CLT, males and those who identified as Asian were more likely to have a prior knowledge of the product. The prior knowledge held by many Asian respondents may be due to the known presence of CLT in European and Asian countries. As stated previously, CLT is a relatively new material to the United States.

Previous studies done by Laguarda-Mallo and Espinoza (2015, 2018) surveyed both the architecture community and engineering firms regarding CLT. Both communities

Table 7.—Rounds 1 and 2—millennials' attitudes toward cross-laminated timber (CLT) building safety.^a

Statement	Mean (mode)		% assigning a rating of:									
			5 (very safe)		4		3		2		1 (very unsafe)	
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Residing in a building with both CLT and other traditional building materials	3.7 (4)	4.1 (4)	21	37	37	44	33	14	7	5	3	1
Residing in a building made entirely of CLT	3.5 (3)	4.1 (4)	16	35	34	44	35	14	11	5	4	2
Residing in a 3-story-high building made of CLT	3.4 (3)	4.0 (4)	12	31	34	46	35	16	14	6	5	1
Residing in a 12-story-high building made of CLT	3.0 (3)	3.7 (4)	10	25	24	39	36	21	19	12	11	3

^a Values are rounded to the nearest tenth and are based on a five-point scale where 5 = very safe and 1 = very unsafe. Percentages are rounded to the nearest whole number.

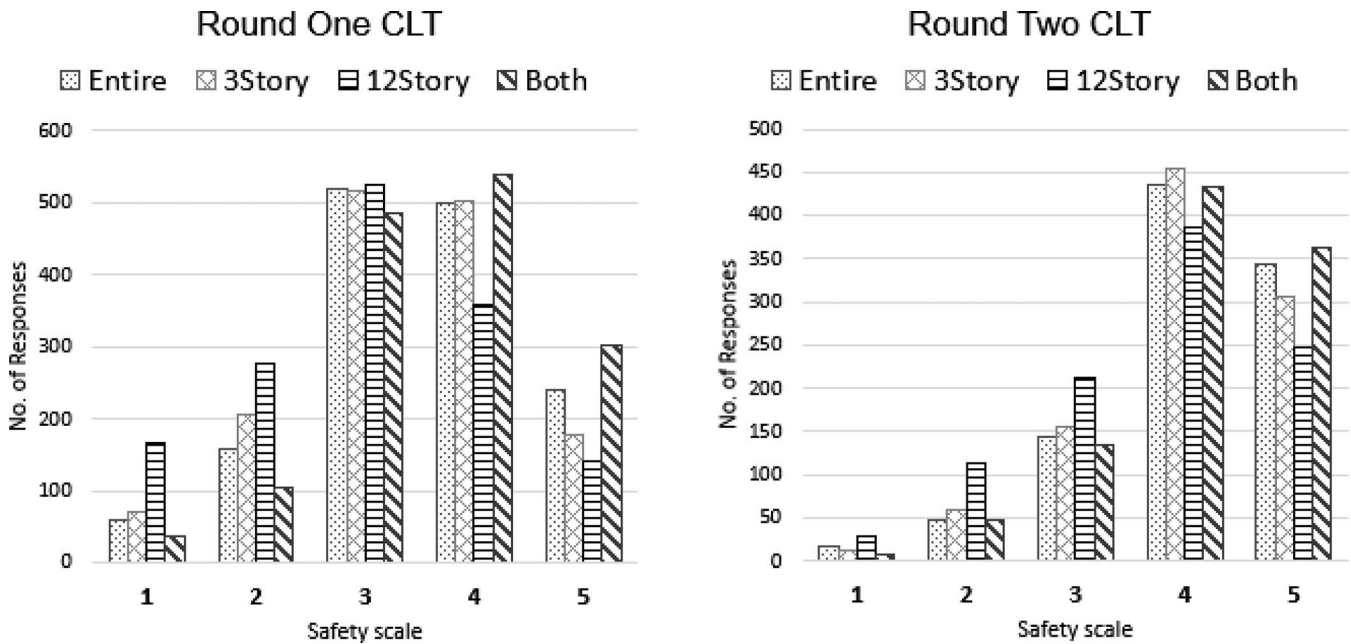


Figure 3.—Comparison of Rounds 1 and 2 of millennials' attitude towards cross-laminated timber (CLT) building safety. Only the responses of the individuals that changed their opinion are displayed. Values are based on a five-point scale where 5=very safe and 1=very unsafe.

expressed a lack of knowledge regarding CLT but had interest in knowing more. They also indicated a willingness to potentially use the product if it became more widely available in the United States.

Perceptions of the millennials surveyed here appear to mirror those of the studies by Laguarda-Mallo and Espinoza (2015, 2018). Millennials' attitudes were improved toward CLT when they were provided additional information regarding its physical and mechanical properties. Millennials also indicated they believed CLT would have a place in the US construction market in the future.

Many respondents mentioned the innovation of CLT moves this product application beyond traditional construction methods. There were many millennials who had thoughts for the "future" of the housing market and use of sustainable materials. Overall, it appears millennials hold a positive view toward wood products and believe they are environmentally friendly.

Conclusions

Millennials expressed positive attitudes about wood products in this study. In particular, they appeared to find wood products stylish, durable, and environmentally friendly. In some instances they responded negatively to, most often in reference to the physical properties and durability of wood. Results suggest that this "negativity" may be related to a lack of knowledge around wood and its structural uses and durability.

When considering new products such as CLT, millennials held more positive views toward the product after given additional information regarding its design and properties. This shows how important information distribution and education of the public is to the industry.

The results of this study suggest two potential audiences for the wood products industry, when considering future marketing campaigns: millennial females, and younger

millennials (ages 18-20). Designing advertisements and structuring campaigns to engage millennial females could open a new avenue for the industry in terms of awareness and popularity. The results of this study indicated millennial females held stronger opinions toward posed questions than males. Because the consumer buying power of millennial females is rising rapidly, the benefits of focusing marketing attention on this segment are becoming more substantial. In addition, because of the important role women play as opinion leaders in many family groups, attaining their interest could assist the wood products industry in heightening awareness of industry practices, values, and environmental responsibility. Altering perceptions currently held by females could positively influence the perceptions of future generations.

In general, millennials aged 18-20 held stronger opinions toward the industry in this study. These young millennials could be a great audience to engage with as they are just beginning their adult life. Some may be starting college and others their work careers. Many of the perceptions held are due to life cycle effects and can change as the respondents get older. Communicating with them at ages 18 to 20 may allow for their future perceptions and opinions to be more informed and positive toward the wood products industry.

Improving online campaigns and industry relationships with college programs may be effective means for interacting with this age group. Since millennials have a close relationship with social media platforms, the industry could use this to its advantage. Using social media to showcase the aesthetic properties of wood in addition to highlighting the structural advantages of using wood versus other materials can assist the industry in increasing awareness and swaying public perceptions. In addition, working with architectural and engineering firms or colleges could possibly help to further the use of wood materials in building and design projects.

Data obtained from this study can provide insight for the industry about how to best reach the millennial audience and consumer. These study results can also inform the wood products industry in its efforts to enhance relations with millennials and subsequent generations. Also, this information may be of use to universities that have forestry and forest products departments that are currently experiencing a decline in enrollment.

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