



SWST – International
Society of Wood
Science and Technology

Millennial Generation Perceptions Surrounding the Wood Products Industry



Kassandra Stout^{1*}, Iris Montague², Rubin Shmulsky³

Abstract

The wood products industry faces increasing pressure to attract the interest of young consumers and potential employees, such as the millennial generation. This study was designed to illuminate perceptions held by the millennial generation towards the wood products industry. The millennial generation or “millennials” are defined in this study as individuals born from 1980 to 2000. In February 2018, an online survey was distributed to over 1,500 millennial-aged individuals and 1,479 usable survey responses were returned. Results from this study indicate that the respondents have neutral perceptions towards the wood products industry and over half of them (65%) were familiar with the industry before taking this survey. Certain topics, such as clear cutting and forest damages, received stronger attitude reactions from respondents. Approximately, 71% of millennials agreed with the statement, “it makes them sad to see cleared forest lands.” Responses also indicated millennials possess weak overall knowledge regarding industry practices. Demographic groups that held significantly stronger attitudes were millennial females, all millennials ages 18-20, and all millennials who identified as Caucasian. This information can be beneficial for developing future marketing strategies, public awareness campaigns, engineering product designs, and improving overall industry success.

Keywords: millennial attitudes, industry perceptions, social media, millennial females, wood products industry

1. Introduction

Over the past several years, the wood products industry has begun to recognize a need to improve industry rapport with young consumers. Special interest in improving relations comes as the industry faces a growing situation of employees retiring faster than empty positions fill.

This trend has spurred industry discussion into what can be done to reach younger generations in terms of consumer support and employee recruitment.

The millennial generation, or “millennials,” is the up-and-coming generation, soon to outnumber baby boomers in the workforce and consumer fields in the U.S. (Fry 2018b). The millennial generation is comprised of individuals born from the early 1980s to late 1990s/early 2000s. There is no current unified age range agreed upon by scholars regarding the millennial generation. Age range estimates date from 1979-1994, 1982-2004, 1980-2000, and beyond (Levenson 2010, Myers & Sadaghiani 2010, Hartman & McCambridge 2011, Raphelson 2014, DeVaney 2015, Holmberg-Wright et al. 2017, Fry 2018a).

Millennials have received enormous attention from the press regarding their cultural norms compared to previous generations (Myers & Sadaghiani 2010). News stories feature differences in behaviors, values, work habits, spending power, and view of life. Millennials are described as idealistic, environmentally conscious,

1 Marketing Associate, Timber Products Company, Springfield, OR 97477

2 Research Forester, USDA Forest Service Northern Research Station and Forest Products Marketing Unit, Starkville, MS 39759

3 Department Head, Department of Sustainable BioProducts, Starkville, Mississippi 39759

* Corresponding author. Email: Kassystout123@gmail.com; Tel: (716) 517-1137

Acknowledgement: This work was made possible with the support of U.S. Department of Agriculture (USDA), Research, Education and Economics (REE), Agriculture Research Service (ARS), Administrative and Financial Management (AFM), Financial Management and Accounting Division (FMAD), Grants and Agreements Branch (GAMB), under Agreement No. 58-0204-6-001. Any opinions, findings, conclusion or recommendations expressed in this publication are those of the author and do not necessarily reflect the view of the U.S. Department of Agriculture.

entitled, optimistic, and self-absorbed, among others (Pew Research 2015, DeVaney 2015).

Millennials have been exposed to multiple financial difficulties including the U.S. stock market crash in 2008 and increasing amounts of student loan debt coupled with low income jobs or unemployment/underemployment (Levenson 2010, Holmberg-Wright et al. 2017). Compared to previous generations, millennials are one of the most racially diverse generations in history (Drake 2014). Millennials also have over double the college-level credentials than early Gen X individuals and late Baby Boomers (Levenson 2010).

Millennials' relationship with technology, specifically social media, is a possible source for a variety of generational and consumer differences. Millennials have been nicknamed "digital natives" because of their technological savviness (Yeaton 2008, Noble et al. 2009). Their generation rose alongside social media platforms and sites such as Myspace (2003), Facebook (2004), YouTube (2005), and Twitter (2006) (van Dijck 2013). The advent of these new online, interactive sites allowed for the growth of a new type of communication, networking, and online shopping.

Millennials believe that internet and social media sites have a positive impact on society (Jiang 2018). Stewart et al. (2017) notes millennials have a distinction for placing technology as a defining characteristic of their generation. In partial credit to social media use, millennials value two-way communication rather than one-way (Holmberg-Wright et al. 2017). Open communication enables millennials to build relationships with their supervisors, peers, and mentors in the workplace (Myers & Sadaghiani 2010).

Compared to previous generations, millennials are likely to "job hop" rather than stay in a position for a long period (Myers & Sadaghiani 2010, DeVaney 2015, Stewart et al. 2017). Some reasons for millennial turnover are a lack of promotional opportunities, an inability to form relationships with mentors and coworkers, a lack of job satisfaction, or conflict with their values on work-life balance (Myers & Sadaghiani 2010, DeVaney 2015, Stewart et al. 2017).

It is important for the wood products industry to keep external and internal environmental factors in mind when considering how best to engage with millennials as consumers or future employees. Compared to other industries that mine materials below the Earth's surface like metals (steel) and fossil fuel sources, the harvesting of forests is more visible (Bowyer et al. 2007).

Pushback from environmental organizations, such as the Sierra Club, against both the industry and governmental agencies, can stir negative reactions from the public toward industry practices (Mater 2005, Portuese et al. 2009). Both climate change and the conservation of forest biodiversity are of growing importance to the public (McFarlane 2005, Winkel 2013).

The public's education, or lack thereof, may be one of the more significant reasons for current misperceptions of the industry. Two studies previously revealed that the public held little factual knowledge concerning the industry and the maintenance of U.S. forestlands (Polzin & Bowyer 1999, Uhrig 1999). More recently, Ter-Mikaelian et al. (2008) found evidence that non-factual or incorrect information still exists that feeds public misperceptions regarding industry forest management. However, there is promise that public opinion can be changed to support the industry and support industry practices to mitigate climate change (St-Laurent et al. 2018).

A lack of public knowledge could stem, in part, from the U.S. education system not covering material sufficiently or at all concerning the wood products industry. Universities and colleges with forest resource programs often report low student enrollment as well as a lack of diversity in terms of race and gender (Sample et al. 2015). Pătări et al. (2017) indicated that university students' opinions (positive or negative) on the industry were dependent upon their current knowledge. Improved educational outreach and industry promotions from leading scientists could help mitigate false information and increase positive perceptions (Mater 2005, Ter-Mikaelian et al. 2008).

A final cause for misperceptions may be the industry working against itself to promote better perceptions. According to Baldwin (2004), the industry has lingered in a state of denial regarding there being a possible perception problem. However, certain companies have begun to take measures towards bettering their public image and recruiting a more diverse set of employees (Henderson 2014).

Whether singular or combined, these factors present plausible reasons for current perceptions held by millennials towards the industry. Thus, the main objective of this study was to determine the current knowledge millennials possess regarding the wood products industry, and especially whether millennials held positive or negative views towards the industry in terms of its practices and relationship with the environment.

2. Methodologies

2.1 Questionnaire Creation

Survey questions were created based on information found in research articles and from informal conversations with industry leaders. There have been no studies conducted thus far (to the author's knowledge) that have surveyed the millennial generation to understand their perceptions of the wood products industry or wood products. Thus, both general and specific questions were created to gauge millennials' individual perceptions. The questions covered several topics related to different sectors of the industry.

The questionnaire consisted of 40 questions. There were multiple formats for the questions 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 years old in 2018 (born 1980-2000).

Half of the questions focused on the wood products industry, and the other half focused on 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. In addition, questions were provided regarding respondent use of social media applications and respondent self-perception of their own generation. The survey was programmed online with the Qualtrics platform. Every question was formatted according to Dillman's tailored design method (Dillman et al. 2014).

2.2 Data Collection

The online survey was distributed nationally in the U.S. 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 conforms to the quality and ethical standards

required of research organizations set by the European Society of Marketing Research (ESOMAR), the Insights Association, The American Marketing Association, and many more (Research Now SSI 2018c).

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. SSI uses *"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 2018). Other examples of quality control measures include, *"digital fingerprinting that flags duplicate respondents,"* and *"pattern recognition software 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 follow 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 Callegaro 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 on-

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

line 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 & Petersen 2010).

2.2.1 Bias Potential

Given the implementation of an online panel company to distribute the survey, measuring non-response bias can be a potential issue (Sharp et al. 2011). However, as this study had two “waves” of responses, non-response bias was tested by comparing the early versus late responses. Other studies have used this approach in calculating non-response bias in online surveys whereby the number of non-respondents is unknown (Aguilar & Cai 2010, Lesser et al. 2011, Montague et al. 2016).

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 respondents if their original perceptions of cross-laminated timber (CLT) changed after being presented with more information regarding its safety. The Kolmogorov-Smirnov test (K-S test) was calculated to compare early versus late response for both questions. The K-S statistic indicated the samples (#1 $K-S = 0.99$, #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.

Coverage bias is another area to consider. Coverage bias occurs when there is a disconnect between the targeted population and the sample drawn (Couper 2000, Blair & Zinkhan 2006). Couper (2000) finds that coverage error is the largest threat to online surveys in regards to its inability to reach respondents outside of the internet. In an attempt to reduce coverage error, this study focused on a single generation and defined the age range to incorporate all of the possible millennial age ranges previously published. The required use of the internet to access the survey would allow only those with the ability to do so. However, this was not viewed as a major limitation, as one of the focuses of this study was respondent use of social media. To access social media, respondents must have access to the internet in some function. Millennials have shown to be prodigious users of the internet compared to older generations. Their heavier presence in the online world supports the idea of this study reaching its targeted population. Therefore, it is anticipated that there is a reduced coverage error as its targeted sample is in line with the targeted population.

2.2.2 Pre-testing the Survey

One round of pre-testing was conducted with the questionnaire before the final version was distributed. Pre-testing of questionnaires is a recommended method to resolve previous undetected issues and to reduce measurement errors with questions before full testing begins (Dillman et al. 2014). For this questionnaire, the pre-test method of choice was to conduct a pilot study of a small number of people from the desired sample population before mass distribution (Dillman et al. 2014).

The pre-test occurred with the aid of the panel sample company Research Now SSI. The questionnaire was administered to a group of respondents for a pre-test prior to the full launch. The requirements for the pre-test follow those previously described: the age range was set from 18-38 years old, all other demographics were random, and it was national. The pre-test was conducted on March 7, 2018. Feedback was collected from respondent comments in the open-ended box at the end of the survey. 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 pre-test yielded 144 usable responses.

Based on the comments provided in the open-ended box of the 144 responses, two questions were altered to ease the answer process of the respondent. The first question altered (#2) had the number of answer choices reduced, while the other question (#10) had the format changed altogether. Only the reduced list for question two was used for analysis. As a result of the altered format for question 10, the 144 usable pre-test responses were withheld from final data analysis for that question.

2.2.3 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 pre-test responses were included in the total target of 1,500. Testing for the first wave occurred from March 14, 2018 to March 28, 2018.

The first wave incurred 1,234 usable completes, including the 144 usable pre-test responses. A second wave was launched in an attempt to attain the 1,500 responses goal. The second wave occurred from April 18, 2018 to April 25, 2018. The second wave incurred 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.

2.3 Data Analysis Measures

The SAS Analytics Software program was utilized to analyze the survey data. Descriptive statistics such as frequencies, means, and modes were calculated for all of the questions. Further analysis included parametric tests performed on yes-or-no, multiple choice, and all of the five-point rating scale questions. The Kruskal-Wallis non-parametric, rank-based test was used to assess the likelihood that the distributions of responses to questions that used the 5-point scale were similar for different groups of respondents (based on age group, gender, education, race, etc.). When the Kruskal-Wallis indicated significance, a Pairwise comparison test was conducted to determine which groups were different. The significance level for this study was at $\alpha = 0.05$.

3. Results and Discussion

3.1 Demographics

The demographic breakdown from the 1,479 usable questionnaires revealed that 54% of respondents were female ($n = 796$) and 46% were male ($n = 672$). The gender makeup for this study is similar to the entire U.S., with 51% female and 49% male (Howden & Meyer 2011). The majority of respondents lived in the South (35%) and Midwest (23%), while 22% were from the West and 20% were from the Northeast. In terms of race/ethnicity, 79% of the respondents identified as Caucasian (white), 10% as African American, 8% as Asian and 2% as Other. The racial makeup of this study is on par with the 2010 U.S. Census (U.S. Census 2010).

Approximately, 45% of respondents identified as married, 38% as single, 15% as living with a partner, and 3% as divorced/separated. The current level of education completed by respondents indicated 39% held college/advanced degrees, 26% held a high school degree or less, 22% had some college (no degree), and 13% held technical/associates degrees. The educational attainment is similar to the U.S. millennial population, where 31% hold college/advanced degrees, 29% hold high school degrees, 19% have some college (no degree), and 10% hold associate degrees (U.S. Census 2017).

Table 1. Age group percentage of survey respondents. ^a

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

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

Perhaps most importantly, the number of survey respondents was relatively equal among age groups (Table 1).

3.2 Self-Perception

When asked their opinion about the label “millennial generation,” approximately one third of respondents (37%) indicated a neutral attitude (“3” value). Only 32% of millennials indicated a positive association (“4 or 5” value) with the label. Respondents were asked to further describe their generation by choosing between two opposing adjectives, for example (1) ambitious versus (2) lazy. Millennials described their generation as expressive (86%), innovative (82%), selfish (66%), and passionate (65%). Respondents also view their generation as independent (52%). In comparison, the Pew Research Center (2015) found that millennials described their generation as self-absorbed (59%), wasteful (49%), and idealistic (39%).

Millennials appear to describe their own generation in a positive light. However, 58% of respondents indicated the millennial generation was unprofessional. This negative attribute indicates some possible cognitive dissonance within the millennial mindset. The outside attention millennials receive may be a reason for this dissonance between being ambitious and passionate, yet unprofessional. The media is quick to ascribe negative traits to millennials, thus possibly infusing the negative thoughts within them (Pew Research Center 2015).

3.3 Social Media

Millennials indicated they are more comfortable using email (75%) and text messaging (78%) compared to face-to-face conversations and phone calls. Approximately, 94% of respondents currently use social media applications and check them daily (62%) or hourly (24%). Millennials ranked the top three most relevant social

media apps as Facebook (71%), Instagram (45%), and YouTube (44%). These findings are consistent with a similar study (Smith & Anderson 2018).

The increasing popularity of the social media platform Instagram should be noted. Millennials and the subsequent generation are moving away from the “first” social media platforms to others like Instagram (Smith & Anderson 2018). One of the reasons young generations are doing so is the increase in older generational participants joining sites such as Facebook (Zickuhr & Madden 2012). In order to distance themselves from the eyes of older relatives, millennials are turning to different platforms (Sweeney 2018). Every industry, including wood products, should perhaps be aware of the shifts in popularity of social media platforms. It is likely that platform popularity will continue to change as technologies evolve and social media will play a more pivotal role in employee recruitment and public interaction.

Respondents were asked to indicate on a five-point rating scale (where 5 = strongly agree and 1 = strongly disagree) their opinion surrounding a series of statements about company use of social media (Table 2).

Millennials agreed (73% rated at 4 or 5) that using social media helps build strong brand identity. Females and all millennials ages 18–20 were more likely to strongly agree, while all millennials with a high school degree were more likely to answer neutral “3” for that statement. Over half of millennials (71%) agreed that social media can help promote corporate social responsibility. Millennial females were more likely to strongly agree, and

all millennials with a high school degree held a neutral attitude (“3” value) towards that statement.

Overall, millennials hold positive views towards companies that use social media to engage with consumers. The views millennials hold towards social media may result from their familiarity and positive associations with it. Compared to previous generations, millennials believe social media has had a positive impact on society (Jiang 2018).

3.4 General Industry

Several general ideas concerning the wood products industry were presented to respondents. Questions revolved around respondent interaction with forests (recreation, etc.), their attitudes toward the industry’s relationship with the environment, and their attitudes towards industry’s relationship with consumers.

When asked if respondents knew of the wood products industry before the survey, 65% said “yes.” Millennials who identified as Caucasian (68%) or Other (72%) were significantly more likely to answer “yes,” compared to African Americans (51%).

There appears to be room to improve awareness of the wood products industry, especially within certain racial groups. A reason that millennials who identified as Caucasian may be more likely to know of the industry stems from the fact that it has traditionally been a Caucasian-dominated field. This aligns with the findings of Sample et al. (2015) indicating there is a continued lack of racial diversity in the industry, as well as in university or college programs associated with wood products. It

Table 2. Millennials’ attitude towards company use of social media apps.^a

Statement	Mean (mode)	Proportion (%) assigning a rating of				
		5 (strongly agree)	4	3	2	1 (strongly disagree)
Social media is an effective tool for companies to use	4.04 (4)	39	39	14	5	3
Social media keeps companies relevant	4.00 (5)	33	41	17	5	2
I have learned of companies through social media	4.01 (4)	40	34	16	6	4
Social media can help promote company corporate social responsibility	3.91 (4)	31	40	22	5	2
Using social media helps to build a strong brand identity for a company	3.96 (4)	35	38	19	5	3
Social media helps to personalize company marketing efforts to the individual	3.86 (4)	29	39	23	6	3
I like to follow companies on social media for news and updates	3.65 (4)	28	35	20	11	6
I feel more engaged with companies who have a social media presence.	3.66 (4)	25	34	27	8	6
I respond to/interact with companies through social media	3.44 (4)	21	33	24	12	10

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

may be beneficial for the industry to conduct further research into how best to attract a more diverse audience and/or workforce.

Respondents who answered “yes” to knowing of the industry were further asked to indicate where they learned about it from a list of 11 choices (including Other). Respondents indicated that they learned about the industry mostly from family (35%), friends (25%), and online (23%). In addition, 23% of millennials indicated they learned of the industry from a college/university. Respondents were least likely to learn about the industry from a career center (6%).

The industry should note that only 23% of millennials indicated learning of the industry via a college/university. Previous studies have revealed forest resource programs (forestry, forest products, etc.) have low enrollment and popularity on campuses (Sample et al. 2015). Improving relations with college/university programs may help to strengthen industry awareness among young generations that plan to pursue higher education.

To determine millennials’ attitudes and perceptions on the importance of various elements/services provided by forests, respondents were asked to rate six forest elements or uses from most important (5) to least important (1) (Figure 1).

The top three most important forest resources chosen by the respondents were oxygen (4.37/5), animal habitat (4.21/5), and water (4.05/5). Wood products was lowest in importance (3.38/5) as a forest resource.

The results from Figure 1 indicate millennials are perhaps a more environmentally conscious group, placing survival and natural elements (oxygen, animal habitat, and water) as the most important reasons for forest existence. Possible reasons for why millennials are more environmentally conscious relate to the atmosphere in which they grew up. New environmental policies were created or amended by the U.S. government and internationally from 1980 to 2000 (U.S. EPA 2017, U.S. EPA 2018). While these policy changes did not have an immediate impact on millennials, they may have influenced their beliefs and values as millennials became active spending consumers. There have been studies that indicate experiences during a young individual’s life can have a lasting impact on their consumer and personal behavior (Holbrook & Schindler 1994, Parment 2013).

The promotion of environmentally charged movies or TV series such as *FernGully: The Last Rainforest* (1992) and the reboot of *The Lorax* (2012) may have imbued

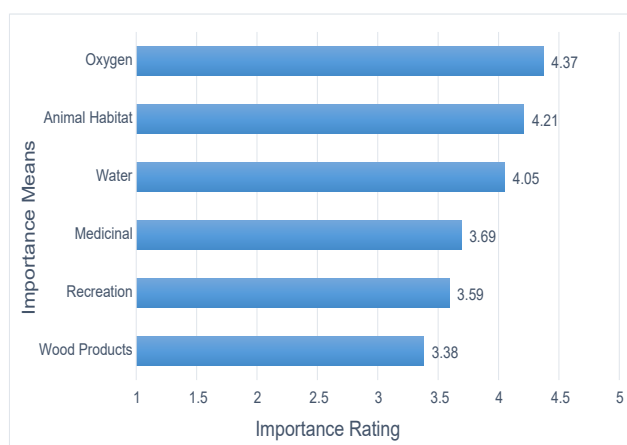


Figure 1. Millennials’ mean rating of the importance of forest existence. (Values are based on a five-point scale, where 1 = least important and 5 = most important. Means are rounded to the nearest hundredth. The 144 pre-test responses were not included for the analysis of this question, as the question format was altered for the final questionnaire.)

certain beliefs into absorbent young millennial minds (Ayers 2012, Tattoli 2017). Studies have shown that documentaries about social concerns can alter public perception and influence companies to change under public pressure (Jones 2011).

In addition, respondents were asked to indicate their attitude towards general statements regarding the wood products industry with a five-point rating scale (where 5 = strongly agree and 1 = strongly disagree) (Table 3).

Sixty-three percent of millennials agreed with the statement “I think the wood products industry damages our forests,” rating it a 4 or 5. For all of the statements in Table 3, there were certain demographic factors for which tests indicated significantly different opinions among groups ($\alpha = 0.05$). Females and millennials ages 18-20 were more likely to strongly agree with the statement related to forest damage.

Millennials ages 18-20 may be more inclined to strongly agree with that statement because of their current education level. Older millennials (over 21) have perhaps learned from their life experiences about wood products industry practices that younger millennials have yet to be exposed to. The negative reaction shown by millennials from this statement reveals the continuation of a public belief that the industry does more harm than good to the environment.

However, 56% of millennials agreed that the wood products industry is important to their daily life. Millennials with technical/ associate degrees were more

Table 3. Millennials' attitude towards general statements about the wood products industry. ^a

Statement	Mean (mode)	Proportion (%) assigning a rating of				
		5 (strongly agree)	4	3	2	1 (strongly disagree)
I think the wood products industry damages our forests	3.71 (4)	24	39	26	8	3
I think the wood products industry is important to my daily life	3.54 (4)	18	38	30	10	4
I think there are opportunities for young people in the industry	3.51 (4)	16	36	35	10	3
I rarely think about where wood products originate	3.20 (4)	16	30	23	20	11
I think the wood products industry is an ageing workplace	3.37 (3)	13	29	42	13	3
I think the wood products industry has kept up with society cultural changes.	3.24 (4)	11	28	40	16	5
I have an interest in joining the wood products industry	2.51 (1)	8	16	25	20	31

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

likely to agree with that statement. A little over half (52%) of millennials agreed there is opportunity for young people in the industry, and males were more likely to strongly agree with this statement. A possible reason may be related to the idea of the industry as a traditionally male-dominated field. Only in recent decades has there been recognition of a need to increase gender diversity (Hansen et al. 2016). Thus, millennial females may be less inclined to agree because of the gender bias that has historically been associated with the industry.

Millennials ages 27-29 (41%) were more likely to agree there is opportunity for young people in the industry, versus those ages 18-20 (24%). This may result from younger millennials (ages 18-20) lacking knowledge about the industry at the college/university level and beyond. As mentioned previously, only 23% of millennials said they learned of the industry at college/university. The small industry presence in this area may help explain why younger millennials (ages 18-20) do not see opportunity in the industry for themselves.

In addition, 31% of millennials strongly disagreed with the statement, "I have an interest in joining the wood products industry." Again, millennial females (39%) were more likely to strongly disagree with that statement than males (22%). All millennials with a high school degree held a neutral attitude towards having an interest in joining the industry.

3.4.1 Relationship with the Environment

Respondents were asked to consider topics concerning the relationship between the industry and environment (Table 4). Again, respondents were given statements to indicate their attitudes/perceptions with a five-point rating scale (5 = strongly agree, 1 = strongly disagree).

Certain demographic factors for all of the statements in Table 4 indicated statistical significance ($\alpha = 0.05$).

Approximately, 71% of millennials agreed that it makes them sad to see forest lands cleared (Table 4), rating this statement at 4 or 5. Females (45%) were most likely to strongly agree versus males (32%) and all millennials with a college/advanced degree were more likely to agree with that statement. Previous studies have shown emotional responses, whether positive or negative, have lasting influences on consumer attitudes and beliefs towards different organizations (Lerner et al. 2015). Some studies have indicated that females, in particular, may be more willing to express stronger negative responses to situations versus males (Barrett et al. 2000, Trampe et al. 2015). The willingness to express negative responses may be a reason why the females in this study have stronger views than males. However, future research should be conducted to discover why females had stronger reactions to certain statements.

In addition, 41% of millennials believed the industry does *not* replant after clearing forests (Table 4). Males were more likely to strongly disagree with that statement. Although there was no statistical significance, it is important to note that more than half of the respondents (56%) were also more likely to agree with the idea that the industry harms the environment.

3.4.2 Relationship to the Consumer

Additional questions asked respondents to indicate their attitudes towards statements about wood products industry advertising with a five-point rating scale (5 = strongly agree, 1 = strongly disagree). Certain demographic factors indicated statistical significance ($\alpha = 0.05$) for all the statements in Table 5.

Table 4. Millennials' perceptions towards the wood products industry's relationship with the environment.^a

Statement	Mean (mode)	Proportion (%) assigning a rating of				
		5 (strongly agree)	4	3	2	1 (strongly disagree)
It makes me sad to see cleared forest lands	3.99 (5)	39	32	20	7	2
I understand why wood products are important to our world	3.78 (4)	22	45	25	6	2
The wood products industry harms the environment	3.61 (4)	19	38	31	9	3
I do not think the wood products industry replants trees they cut down	3.22 (3)	15	26	35	16	8
I think wood products contribute to improving our environment	3.15 (3)	12	25	36	20	7

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

Table 5. Millennials' attitude towards the wood products industry marketing.

Statement	Mean (mode)	Proportion (%) assigning a rating of				
		5 (strongly agree)	4	3	2	1 (strongly disagree)
I think wood products companies should create awareness of their environmental friendliness	3.99 (4)	35	36	23	5	1
I think knowing how wood products benefit the environment would be beneficial to consumer opinion	3.92 (4)	32	35	28	4	1
I think wood products marketing is mainly business to business	3.47 (4)	14	37	35	11	3
Wood products marketing does not focus on the consumer	3.21 (3)	10	24	48	14	4
I do not think wood products marketing needs to be improved	2.86 (3)	6	18	43	23	10

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

Seventy-one percent of millennials agreed with the statement that the industry should continue to promote their environmental friendliness (Table 5), rating it 4 or 5. Females (41%) were most likely to strongly agree, compared to males (28%), and all millennials ages 33-35 were most likely to agree with that statement. The significance of females being more likely to agree could relate to a desire to support industries that care about the welfare of all living things. Pätäri et al. (2017) and Panwar et al. (2010) indicated females have a preference for responsible and environmentally conscious businesses. Older millennials ages 33-35 may also possess a greater desire to support environmentally conscious industries.

Millennials holding a college/advanced degree and those who identified as Caucasian were most likely to agree that wood products companies should promote their environmental friendliness. Millennials with higher education levels may agree with this notion due to their knowledge and value of working to protect the environment.

Over two thirds of millennials (68%) agreed that consumers benefit from knowing wood products companies

are environmentally friendly (Table 5). Millennial females were more likely to strongly agree with that statement. A potential reason for millennial females agreeing with this need for consumer education relates to their economic power as consumers. Females have influence in over half of all purchases, which can influence what their children, spouses, and friends might purchase in the future (Silverstein & Sayre 2009, King 2017).

In addition, 33% of millennials disagreed with the statement, "I do not think wood products marketing needs to be improved," assigning it a value of 1 or 2. Millennial females and all millennials with college/advanced degrees were more likely to disagree with that statement. Millennials who identified as Caucasian were more likely to disagree with that statement as well.

4. Study Limitations

Limitations apply to the results obtained from this study, as is the case with surveys in general.

Data for this study relied on respondents' own report of their behaviors, beliefs, or attitudes. People are often biased when they report on their own experiences, and

caution must be used when interpreting data (Devaux & Sassi 2016). The nature of the data collection also prevented the authors from obtaining a clear response rate. The authors know the survey was sent to 4,900 individuals on a panel. However, we do not know if all 4,900 had an opportunity to see or complete the survey because collection was stopped once the target of 1,500 responses was met. Stating that the response rate is 30% is deceiving because of this uncertainty. Yet, if the response rate of 30% is taken at face value, it is similar to response rates of other forest products studies (Bumgardner et al. 2017). As a result, one should be cautious in generalizing the findings of this study, given the lack of an accurate response rate.

5. Conclusion

The millennial generation does not appear to have strong knowledge regarding the wood products industry, lacking general concepts of industry practices and values. Across the study, educational levels indicated significant differences of opinion between individuals with a high school degree versus those with a college degree or higher. Respondents with a high school degree were more likely to indicate neutral opinions (value of "3") versus respondents with a college degree who indicated stronger positive or negative opinions (all other values). This differentiation suggests further research should be conducted to understand how education level affects opinion towards the wood products industry.

Traditionally, the industry does not market directly to consumers. However, future efforts to provide more information about the industry and products may be beneficial. Based on the results of this study, there are two potential audiences the wood products industry should consider for future marketing campaigns. The first audience is millennial females. Designing advertisements and structuring campaigns to engage millennial females could open a new avenue for the industry in terms of awareness and popularity. Millennial females held stronger opinions, both positive and negative, towards posed questions than did males for this study.

Yet, this gender significance was seen in a previous study by Panwar et al. (2010), where women had stronger opinions towards the industry. It could be beneficial for the industry to focus on millennial females as an audience because of their consumer power and opinion leader influence within many families (Silverstein & Sayre 2009, Fromm & Garton 2013, Brennan 2018). Across

generations and continents, females are the most powerful economic driving force (Silverstein & Sayre 2009, Brennan 2018). Attaining their interest could benefit the wood products industry in heightening awareness of industry practices, values, and their environmental responsibility. Altering perceptions held by females currently could positively influence the perceptions of future generations.

The second audience the industry may consider focusing on is millennials ages 18-20. This group also held stronger overall opinions towards the industry in this study. These young millennials could be a great audience with which to engage, as they are just beginning their adult lives. Some may be starting college and others their work careers. Communicating with them at ages 18-20 may allow for their future perceptions and opinions to be more positive towards the wood products industry. Improving online campaigns and industry relationships with college programs may serve as great ways to interact with them.

There are a variety of potential avenues the wood products industry could use to engage with and reach millennials. Traditional sources of information remain viable, but the internet has become a popular way for people to get information. Millennials have a close relationship with social media platforms and the industry could use this to their advantage.

It may be unreasonable and difficult for the industry to change the visibility of its work in harvesting wood. Yet, there is potential for this assumed weakness to be turned into strength for the industry. Possible marketing campaigns could be created to educate and emphasize the sustainable initiatives that the industry has taken. Large promotional boards could be placed near harvested forest sites explaining where the trees went, what products they are destined to create (lumber, etc.), and how the cleared site will recover in a short time. Millennials agreed they would like to know more about the environmental friendliness of the industry, and this is a potential avenue to educate them.

The results of the study can serve both industry and academia in a variety of functions. The wood products industry can use the results to build positive relationships with these current and future consumers. The results could also be used to strategize on how to create effective marketing campaigns or design relevant products the consumer will purchase. Other industries related to wood products may also find value in the results of this

study. In the academic world, these results can function as a foundation for future studies revolving around consumer views of wood products or the larger industry.

6. References

- Aguilar, FX, & Cai, Z. 2010. Conjoint effect of environmental labeling, disclosure of forest of origin and price on consumer preferences for wood products in the US and UK. *Ecological Economics* 70, 308–316.
- Ayers, K. 2012. The Environmental Message behind 'The Lorax.' *The New Yorker*. Retrieved from <https://newyork.cbslocal.com/2012/04/09/the-environmental-message-behind-the-lorax/>
- Baldwin, RF. 2004. Breaking new ground: The forest industry quest for public acceptance. *Forest Products Journal* 54(1), 8–14.
- Baker, R, Blumberg, SJ, Birck, JM, Couper, MP, Courtright, M, Dennis, JM, Dillman, D, Frankel, MR, Garland, P, Groves, RM, Kennedy, C, Krosnick, J, Lavrakas, PJ, Lee, S, Link, M, Piekarski, L, Rao, K, Thomas, RK, & Zahs, D. 2010. AAPOR Report on Online Panels. *The Public Opinion Quarterly* 74(4), 711–781.
- Barrett, LF, Lane, RD, Sechrest, L, & Schwartz, GE. 2000. Sex differences in emotional awareness. *Personality and Social Psychology Bulletin* 26(9), 1027–1035.
- Blair, E, & Zinkhan, GM. 2006. Nonresponse and generalizability in academic research. *Journal of the Academy of Marketing Science* 34(1), 4–7.
- Bowyer, JL, Shmulsky, R, & Haygreen, JG. 2007. *Forest Products and Wood Science: An Introduction*. Blackwell Publishing, Ames, IA.
- Brennan, B. 2018. Top 10 things everyone should know about women consumers. Retrieved from <https://www.bloomberg.com/diversity-inclusion/blog/top-10-things-everyone-know-women-consumers/>
- Bumgardner, M, Montague, I, & Wiedenbeck, J. 2017. Survey response rates in the forest products literature from 2000 to 2015. *Wood and Fiber Science* 49(1), 84–92.
- Callegaro, M, Baker, R, Bethlehem, J, Goritz, AS, Krosnick, JA, & Lavrakas, PJ. 2014. Online panel research: History, concepts, applications, and a look at the future. Pages 1–22 in *Online Panel Research: A Data Quality Perspective*, ed. M Callegaro, R Baker, J Bethlehem, AS Goritz, JA Krosnick, PJ Lavrakas. John Wiley & Sons, Ltd., UK.
- Couper, MP. 2000. Web surveys: A review of issues and approaches. *The Public Opinion Quarterly* 64(4), 464–494.
- DeVaney, SA. 2015. Understanding the Millennial Generation. *Journal of Financial Service Professionals* 69(6) 11–14.
- Devaux M, & Sassi, F. 2016. Social disparities in hazardous alcohol use: Self-report bias may lead to incorrect estimates. *European Journal of Public Health* 26(1), 129–134.
- Drake, B. 2014. 6 new findings about Millennials. Retrieved from <https://www.pewresearch.org/fact-tank/2014/03/07/6-new-findings-about-millennials/>
- Dillman, DA, Smyth, JD, & Christian, LM. 2014. *The Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. John Wiley & Sons, Inc., Hoboken, New Jersey.
- Farrell, D, & Petersen, JC. 2010. The growth of Internet research methods and the reluctant sociologist. *Sociological Inquiry* 80(1), 11–125.
- Fromm, J, & Garton, C. 2013. *Marketing to Millennials: Reach the Largest and Most Influential Generation of Consumers Ever*. Amacom.
- Fry, R. 2018a. Millennials are the largest generation in the U.S. labor force. Retrieved from <https://www.pewresearch.org/fact-tank/2018/04/11/millennials-largest-generation-us-labor-force/>
- Fry, R. 2018b. Millennials projected to overtake Baby Boomers as America's largest generation. Retrieved from <https://www.pewresearch.org/fact-tank/2018/03/01/millennials-overtake-baby-boomers/>
- Hansen, E, Conroy, K, Toppinen, A, Bull, L, Kutnar, A, & Panwar, R. 2016. Does gender diversity in forest sector companies matter? *Canadian Journal of Forest Resources* 46, 1255–1263.
- Hartman, JL, & McCambridge, J. 2011. Optimizing millennials' communication skills. *Business Communication Quarterly* 74(1), 22–44.
- Henderson, E. 2014. The chief diversity officer's view of the diversity and inclusion journey at Weyerhaeuser. Pages 431–450 in *Diversity at Work: The Practice of Inclusion*, ed. BM Ferdman & BR Deane. Jossey-Bass/John Wiley & Sons, Inc., San Francisco.
- Holbrook, MB, & Schindler, RM. 1994. Age, sex, and attitude toward the past as predictors of consumer's aesthetic tastes for cultural products. *Journal of Marketing Research* 31(3), 412–422.
- Holmberg-Wright, K, Hribar, T, & Tsegai, JD. 2017. More than money: Business strategies to engage millennials. *Business Education Innovation Journal* 9(2), 14–23.
- Howden, LM, & Meyer, JA. 2011. Age and Sex Composition: 2010. Retrieved from <https://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf>
- Jiang, J. 2018. Millennials stand out for their technology use, but older generations also embrace digital life. Retrieved from <https://www.pewresearch.org/fact-tank/2018/05/02/millennials-stand-out-for-their-technology-use-but-older-generations-also-embrace-digital-life/>
- Jones, EE. 2011. Reel to real: can documentaries change the world? Retrieved from <https://www.theguardian.com/film/2011/oct/06/documentaries-puma-creative-impact-award>
- King, M. 2017. Want a piece of the 18 trillion dollar female economy? Start with gender bias. Retrieved from <https://www.forbes.com/sites/michelleking/2017/05/24/want-a-piece-of-the-18-trillion-dollar-female-economy-start-with-gender-bias/#133c11156123>
- Lerner, JS, Li, Y, Valdesolo, P, & Kassam, KS. 2015. Emotion and decision making. *Annual Review Psychology* 66, 799–823.
- Lesser, VM, Yang, DK, Newton, LD. 2011. Assessing hunters' opinions based on a mail and a mixed-mode survey. *Human Dimensions of Wildlife* 16(3), 164–173.
- Levenson, AR. 2010. Millennials and the world of work: An economist's perspective. *Journal of Business Psychology* 25, 257–264.
- Mater, J. 2005. The role of the forest industry in the future of the world. *Forest Products Journal* 55(9), 4–10.
- McFarlane, B. 2005. Public perceptions of risk to forest biodiversity. *Risk Analysis* 25(3), 543–553.
- Montague, I, Gazal, KA, Wiedenbeck, J, & Shepherd, J-G. 2016. Forest products industry in a digital age: A look at E-commerce and social media. *Forest Products Journal* 66(1/2), 49–57.
- Myers, KK, & Sadaghiani, K. 2010. Millennials in the workplace: A communication perspective on millennials' organizational relationships and performance. *Journal of Business Psychology* 25, 225–238.
- Noble, SM, Haytko, DL, & Phillips, J. 2009. What drives college-

- age Generation Y consumers? *Journal of Business Research* 62, 617–628.
- Panwar, R, Han, X, & Hansen, E. 2010. A demographic examination of societal views regarding corporate social responsibility in the US forest products industry. *Forest Policy and Economics* 12(2), 121–128.
- Parment, A. 2013. Generation Y vs. baby boomers: Shopping behavior, buyer involvement and implications for retailing. *Journal of Retailing and Consumer Services* 20, 189–199.
- Pätäri, S, Arminen, H, Albareda, L, Puumalainen, K, & Toppinen, A. 2017. Student values and perceptions of corporate social responsibility in the forest industry on the road to a bioeconomy. *Forest Policy and Economics* 85, 201–215.
- Pew Research Center. 2015. Most Millennials Resist the “Millennial” Label. Retrieved from <https://www.people-press.org/2015/09/03/most-millennials-resist-the-millennial-label/>
- Polzin, PE, & Bowyer, JL. 1999. Misperceptions about forests and wood products: A statewide survey in Montana. *Forest Products Journal* 49(9), 37–42.
- Portuese, BG, Malmshamer, RW, Anderson, A, Floyd, D, & Keele, D. 2009. Litigants’ characteristics and outcomes in US Forest Service land-management cases 1989 to 2005. *Journal of Forestry* 107 (1), 16–22.
- Raphelson, S. 2014. From GIs to GenZ (Or Is It iGen)? How generations get nicknames. Retrieved from <https://www.npr.org/2014/10/06/349316543/don-t-label-me-origins-of-generational-names-and-why-we-use-them>
- Research Now SSI. 2018a. Consumer Online Survey Research. Retrieved from <https://www.surveysampling.com>
- Research Now SSI. 2018b. Integrated Technology Platform. Retrieved from <https://www.surveysampling.com>
- Research Now SSI. 2018c. Market Research Data Quality. Retrieved from <https://www.surveysampling.com>
- Sample, VA, Bixler, RP, McDonough, MH, Bullard, SH, & Snieckus, MM. 2015. The promise and performance of forestry education in the United States: Results of a survey of forestry employers, graduates, and educators. *Journal of Forestry* 113(6), 528–537.
- Sharp, A, Moore, P, & Anderson, K. 2011. Are the prompt responders to an online panel survey different from those who respond later? *Australian Journal of Market & Social Research* 19(1), 25–33.
- Silverstein, MJ, & Sayre, K. 2009. The Female Economy. Retrieved from <https://hbr.org/2009/09/the-female-economy>
- Smith, A, & Anderson, M. 2018. Social Media Use in 2018. Retrieved from <https://www.pewinternet.org/2018/03/01/social-media-use-in-2018/>
- Stewart, JS, Oliver, EG, Cravens, KS, & Oishi, S. 2017. Managing millennials: Embracing generational differences. *Business Horizons* 60, 45–54.
- St-Laurent, GP, Hagerman, S, Kozak, R, & Hoberg, G. 2018. Public perceptions about climate change mitigation in British Columbia’s forest sector. *PLoS ONE* 13(4), 1–25.
- Sweney, M. 2018. Is Facebook for old people? Over-55s flock in as the young leave. Retrieved from <https://www.theguardian.com/technology/2018/feb/12/is-facebook-for-old-people-over-55s-flock-in-as-the-young-leave>
- Tattoli, C. 2017. FernGully at 25: How an upstart Disney rival created a millennial Silent Spring. *Vanity Fair*. Retrieved from <https://www.vanityfair.com/hollywood/2017/04/ferngully-making-of>
- Ter-Mikaelian, MT, Colombo, SJ, & Chen, J. 2008. Fact and fantasy about forest carbon. *The Forestry Chronicle* 84(2), 166–171.
- Trampe, D, Quoidbach, J, & Taquet, M. 2015. Emotions in everyday life. *PLoS ONE* 10(12), 1–15.
- Uhrig, PA. 1999. *Public Perceptions of the Forest Products Industry in the United States*. (Unpublished master’s thesis), Virginia Polytechnic Institute and State University, Blacksburg, VA.
- U.S. Census Bureau. 2017. Educational Attainment in the United States. Retrieved from <https://www.census.gov>
- U.S. Census Bureau. 2010. Race. U.S. Census. Retrieved from <https://www.census.gov>
- U.S. Environmental Protection Agency. 2017. Evolution of the Clean Air Act. Retrieved from <https://www.epa.gov>
- U.S. Environmental Protection Agency. 2018. Summary of the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund). Retrieved from <https://www.epa.gov>
- Van Dijck, J. 2013. Engineering sociality in a culture of connectivity. Pages 2–23 in *The Culture of Connectivity: A Critical History of Social Media*. Oxford University Press, Oxford.
- Winkel, G. 2013. Forest conservation policy in a changing climate. *Forest Policy and Economics* 36, 1–5.
- Yeaton, K. 2008. Recruiting and managing the “Why” Generation: Gen Y. *The CPA Journal* 78(4), 68–72.
- Zickuhr, K, & Madden, M. 2012. Older adults and internet use. Retrieved from <https://www.pewinternet.org/2012/06/06/older-adults-and-internet-use/>