

Article

Perceptions of Wood Flooring: Insights from Croatian Consumers and Wood Experts

Andreja Pirc Barčić ¹, Kristina Klarić ^{1,*}, Manja Kitek Kuzman ², Alen Mijoč ¹, Ivana Perić ¹
and Petra Grošelj ³

¹ Faculty of Forestry and Wood Technology, University of Zagreb, Svetošimunska cesta 23, 10000 Zagreb, Croatia; apirc@sumfak.unizg.hr (A.P.B.); alen.mijoc@gmail.com (A.M.); iperic@sumfak.unizg.hr (I.P.)

² Department of Wood Science and Technology, Biotechnical Faculty, University of Ljubljana, 1000 Ljubljana, Slovenia; manja.kuzman@bf.uni-lj.si

³ Department of Forestry and Renewable Forest Resources, Biotechnical Faculty, University of Ljubljana, 1000 Ljubljana, Slovenia; petra.groselj@bf.uni-lj.si

* Correspondence: kklaric@sumfak.unizg.hr

Abstract: Consumer preferences in interior design are increasingly shaped by sustainability, aesthetics, and functionality. Wood flooring, valued for its natural appeal and durability, remains a preferred option, yet little research has explored perceptions specific to the Croatian market. This study investigates consumer behavior and preferences for wood flooring in Croatia, focusing on decision-making drivers, preferred materials and attributes, and differences between consumer and expert perspectives. Data were collected from 157 respondents via structured questionnaires using snowball sampling, focusing on their preferences, purchasing behavior, and evaluation of wood flooring attributes. The results were analyzed using the AHP and CRITIC methods to assess and compare the relative importance of nine selected product attributes from both consumer and expert perspectives. By integrating subjective and objective evaluations, the study offers insights into how both consumers and professionals assess wood flooring. The findings indicate a strong preference for classic, natural wood flooring, especially massive and multilayer parquet, driven by aesthetic appeal, quality, and durability. Although sustainability was positively viewed, it was not a top purchasing criterion. Notable differences in attribute prioritization were found between consumers and experts, particularly regarding price and prestige. The combined weights, which integrate consumer and expert evaluations, indicate that product quality, liability for damages, and durability are the most valued attributes, while price, ease of installation, and prestige are the least influential. Additionally, the findings aim to support manufacturers and retailers in aligning their strategies with market needs and advancing sustainable consumption practices.

Keywords: wood flooring; consumer preferences; consumer behavior; sustainable consumption; AHP method; CRITIC method



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1. Introduction

1.1. The Role and Value of Wood Flooring

In a constantly evolving market, understanding customer purchasing behavior is essential for companies to operate effectively and achieve long-term success. However, the world has changed, and so have consumers' preferences about products. Nowadays, consumers are encouraged to participate in sustainable consumption and support sustainable development [1–3]. In this context, the advantages of wood play a crucial role

in its competitiveness against non-wood products. Wood is a natural material that has a positive impact on humans and is widely used in interior environments. The use of wood products plays a crucial role in promoting sustainable development and facilitating the transition to bio-based circular economies [4–6]. Wooden materials offer sustainable benefits across economic, social, and environmental dimensions [7]. Their advantages include durability [8], enhancement of living environments [9], aesthetic appeal [10], and the ability to store carbon while reducing greenhouse gas emissions [11].

1.2. Consumer Perception and Decision-Making

Consumer preferences are a defining feature of the market, and as Dhar (1997) [12] notes, individuals frequently encounter situations requiring them to choose between multiple alternatives. A widely accepted model of consumer decision-making was introduced by Engel, Kollat, and Blackwell in 1968, commonly referred to as the EKB model [13]. This framework outlines a five-step process: problem or need identification, information search, evaluation of alternatives, purchase decision, and post-purchase behavior, that consumers follow when selecting a product [14,15]. Throughout this process, they assess the product's functional benefits, applying various criteria to compare alternatives, often investing considerable time in their final decision. This is particularly evident for high-value purchases, such as wood flooring, where consumers carefully deliberate between options.

However, the way consumers search for and process information has evolved significantly. Today, they have unlimited access to a wealth of data, are continuously exposed to advertising [16], and benefit from new retail concepts offering a broader range of choices [17]. Before even stepping into a store, many consumers are already familiar with a product's price range, style, and features [18]. They also engage with brands through reviews, recommendations, and detailed product descriptions, while search engines and social media platforms serve as key sources of inspiration and decision-making guidance [19], and this trend is particularly strong among younger audiences who spend more time online [20].

Additionally, many consumers feel more confident in their purchasing decisions when combining online research with in-store showroom experiences, a strategy known as showrooming [21].

Market segmentation helps categorize consumers into groups with similar needs [22], distinguished by factors such as age, gender, education, profession, location, purchasing power, behavior, interests, and desires [23,24]. Nicholls and Stiefel (2007) [25] found that socio-demographic characteristics like age, gender, and income influence consumer preferences for various wood products. A deeper understanding of consumer purchasing behavior would enable wood industry companies to strategically influence buyers at each stage of their decision-making process. Additionally, aligning business strategies with consumer needs could enhance product development and overall business performance within the wood industry [26].

Many consumers perceive their homes as a reflection of their identity. According to Nakamura et al. (2019) [27], incorporating wooden furniture and other wood products into interior spaces creates a natural ambiance. Additionally, the presence of solid wood indoors contributes to lower stress levels and enhances indoor air quality. The study conducted by Harju and Lähtinen (2021) [28], which examines Finnish consumer perceptions of wooden interior product quality, with a focus on sustainability, showed, for example, that surface patterns, textures, and aesthetics influence purchasing decisions and that women prioritize aesthetic qualities more than men.

1.3. Market Situation and Trends

Wood is one of the most popular flooring materials, valued for its excellent wear resistance, durability, impact resistance, low heat conductivity, and quiet walking experience, with primary hardwood species for flooring including oak, beech, maple, and ash [29–31]. The New European Bauhaus (NEB) initiative seeks to harmonize sustainability, aesthetics, and inclusivity within the built environment. Wood flooring aligns seamlessly with these principles, offering a renewable and visually appealing option for interior design.

The floor supports everyday activities and significantly shapes the character of a room. The floor occupies a large area in the interior environment and is a crucial aspect of interior design, as it is an area that users observe for extended periods [32].

Common flooring materials include solid wood, wood-based products, PVC, textiles, stone, and ceramics [33]. Despite the wide range of available options, wood and wood-based materials remain highly preferred due to their compatibility with other materials, hygienic properties, aesthetic appeal, resistance to physical and mechanical stress, and overall durability [34].

For example, solid wood flooring, made entirely from natural wood, helps regulate indoor temperature and humidity while emitting no pollutants during use. Its natural grain and color contribute to a warm, comfortable atmosphere, making it an excellent choice for interior design [35]. To preserve both the functionality and appearance of wooden flooring, a variety of surface treatments have been used throughout history, often based on natural ingredients [36]. According to results from Berger et al. (2006) [37] wood flooring with a ‘natural’ oiled surface was perceived as warm, slightly rough, and relatively soft in comparison to laminate flooring, which was seen as cold, smooth, and hard, while lacquered parquet was described as moderately cold, moderately smooth, and moderately hard. The study conducted by Spetic et al. (2006) [38] examined Canadian households’ perceptions of wood flooring and carpeting based on six product attributes (pleasantness; attractiveness; healthiness; durability; affordability; and environmental friendliness), with wood flooring rated higher in all categories except affordability. Additionally, wood flooring has been a cornerstone of interior design, architecture, and construction for centuries. Its ability to blend tradition with modern aesthetics makes it a preferred flooring solution across residential and commercial spaces. From classic hardwood floors to contemporary engineered wood options, this material remains highly valued for its durability, comfort, and timeless appeal. Wood flooring offers distinct advantages, including durability, comfort, and timeless natural beauty. It enhances interior spaces with warmth and elegance while providing long-lasting performance and aesthetic. It enhances interior spaces with warmth and elegance while providing long-lasting performance. Bysheim et al. (2016) [39] presented results from qualitative research on how people perceive the connection between building materials and their indoor experience. The research included different groups of participants (students and architects, engineers, forest products, and agriculture professionals) from Norway, Austria, Sweden, and France. Results showed that flooring was considered the most important surface for well-being in interiors because of the physical contact with the material. The professionals mentioned flooring as an important surface for well-being, and floors have a tactile sensation since we walk on them. Oak floors were perceived as a timeless material. However, participants highlighted several properties of wood that promote well-being, including its ability to create an exclusive and stylish ambiance, prevent an institutional feel in indoor spaces, provide insulation and warmth as a soft material, emit a pleasant scent, and potentially enhance indoor air quality.

The global wood flooring market has steadily evolved, influenced by advancements in wood processing technologies and changing consumer preferences. A growing emphasis

on sustainability and eco-friendly construction materials has fueled demand for wood flooring sourced from certified, sustainably managed forests.

According to the Wood Flooring Market Size and Share Industry Report (2024) [40], the global wood flooring market was valued at USD 51.1 billion in 2024 and is expected to reach USD 67.1 billion by 2030, growing at a Compound Annual Growth Rate (CAGR) of 4.6% during the forecast period. Additionally, wooden flooring is popular in Europe, and the market is large, dynamic, economically important, and sensitive to consumer trends, and contributes significantly to the achievement of environmental development.

European parquet flooring production massively fell 30.5% in 2023 to 54.4 million m². Production in FEP countries had reached 78 million m² in 2022 and as much as 81.8 million m² in 2021 during the COVID-19 pandemic. The European production outside the European Parquet Federation (FEP) countries is at an estimated 10.4 million m². The 2023 total parquet production per type remains similar to the picture already presented from 2010 onward, whereby multilayer comes in first with 84% (compared to 83% in 2022), being followed by solid at 14% (compared to 15% in 2022) and mosaic with a stable 2% of the total cake. In absolute production figures by country, Poland maintains its top position at 18.18%, Austria, with 14.47%, keeps the second place on the podium, and Sweden is the third (11.86%). Consumption also saw a 30% decline, with the 2023 figure standing at 61.8 million m² (2022: 87.1 million m²), the lowest amount for more than 10 years. In terms of consumption per country, Germany keeps its first position despite a declining share at 17.44%, Italy at 13.35%, and Sweden at 11.06%. In 2024, the Scandinavian wood parquet panels market was valued at USD 293 million, marking a 15% increase from the previous year. Further, Austria experienced a 5% decline in parquet consumption in the third quarter (Q3) 2024 compared to the same period in 2023, following an already weak quarter. Projections for 2025 remain pessimistic, largely due to the low volume of new constructions. While raw material costs are stable, the quality of Croatian oak has suffered due to prolonged storage in wet forests after storms [41].

Glavonjić et al. (2020) [42] research findings highlight the significant role of Southeastern European Countries (SEECs), including Croatia, in Europe's wood flooring production and export to the EU market. For example, in 2018, the SEEC produced 8.48 million m² of wood flooring, accounting for 9.4% of total European production. Of this, 2.6 million m² (or 64% of the region's total exports) were shipped to the EU, demonstrating the region's strong export orientation.

In Croatia, the production of wooden floors accounts for 12% of the total production of the wood industry, and the share of the export of wooden floors in the total export of the wood industry of the Republic of Croatia is 11% (of which 75% goes to the European Union markets). The quality of Croatian parquet is recognized in the international market, as evidenced by export figures. In the first nine months of 2022, Croatia exported 50.4 thousand tons of parquet worth EUR 157.5 million, marking a 5% increase in volume and a 64% increase in export value compared to the same period in 2019. During this period, the largest share of wood floors exports went to Germany (EUR 25.9 million), followed by Switzerland (EUR 25.8 million), Italy (EUR 20.3 million), Austria (EUR 17.1 million), and Lithuania (EUR 15.6 million). In addition to these key markets, Croatian parquet is also exported to 38 other countries, which collectively account for 34% of total exports, providing a strong foundation for further business expansion and export growth [43]. Furthermore, wood floor consumption grew by 3% in Q1-Q3 2024 compared to the same period in 2023, when demand was notably low. As a small market, Croatia must seek new export opportunities to sustain growth.

1.4. Aim of the Research

Although around 75% of wooden flooring from Croatia is exported to EU markets, recent developments such as stagnation and declining demand in key export countries like Germany and Austria [43] indicate a need for reorientation of market focus. At the same time, the construction sector in Croatia has been growing strongly, with production indices significantly above the EU average (for example, 132.5 in November 2024 compared to the EU average of 103.6). This situation further highlights the importance of strengthening domestic consumption. Therefore, domestic consumer preferences can be used to adjust product strategies more effectively to the national market and improve its resilience.

While wood flooring is a well-established industry, there is a lack of comprehensive studies focusing on Croatian consumers and expert perspectives. Research that delves into how these groups evaluate wood flooring in terms of sustainability, aesthetics, and practical considerations is needed. Previous research has mainly focused on aspects of using wood materials in interiors and their general properties and effects on environment quality, user well-being, and aesthetic aspects [35,39], whereas studies devoted exclusively to end-user perceptions of wood flooring remain limited. This study fills the identified research gap by combining a quantitative survey conducted exclusively among Croatian wood flooring consumers with subjective assessments and objective multi-criteria evaluation methods (CRITIC and AHP). Bridging this knowledge gap can provide valuable insights for manufacturers, retailers, and design professionals looking to cater to the Croatian market more effectively. To the best of our knowledge, this study introduces a novel approach to exploring wooden flooring preferences by combining consumer survey data with multi-criteria decision-making methods (CRITIC and AHP), which has not yet been applied in this context. Considering the aforementioned context, this study aims to gain deeper insight into changing consumer preferences regarding wood flooring, their purchasing habits, and behaviors throughout the buying process. The primary objective is to identify key aspects of consumer behavior by analyzing the following:

- (1) Preferences regarding flooring type and material;
- (2) Activities that influence the decision to purchase wood flooring;
- (3) Attributes that impact purchasing decisions for wood flooring.

An additional objective is to compare the perceived importance of selected attributes between potential consumers (survey respondents) and wood industry experts.

This paper is structured as follows. Section 1 introduces the topic and explains the aim of the research, which is to identify the most important factors when choosing wooden flooring, based on the opinions of consumers and experts. Section 2 describes the materials and methods used in the study, including the consumer survey, the CRITIC, and AHP methods. Section 3 presents the results and discusses them. Finally, Section 4 provides the main conclusions of the research and presents directions for future research.

2. Materials and Methods

2.1. Questionnaire Design, Sampling, and Data Collection

The questionnaire was developed to explore how Croatian consumers perceive wood flooring products and which product attributes they consider most important. This context was chosen due to the lack of similar studies in Croatia and to identify key consumer preferences and decision-making factors when selecting wooden flooring. The collected data were later used in the multi-criteria evaluation conducted with the CRITIC and AHP methods.

Based on the research objective of collecting information from potential wooden flooring consumers, a questionnaire was developed based on the existing literature and

previous research results of the authors [15,44–48]. The context of the questionnaire is presented in Table 1.

Table 1. Questionnaire context.

Item	Description
Target group	Potential buyers of wooden flooring in Croatia
Questionnaire period	April–May 2022
Sampling method	Snowball sampling via social media
Questionnaire sections	1. Demographics 2. Purchase behavior 3. Evaluation of flooring attributes
Question types	- Multiple-choice - 5-point Likert scale
Distribution method	Online via Google Forms, anonymous
Responses received	157 completed questionnaires

The first part of the questionnaire contained questions about the demographic and economic characteristics of the customers (gender, age, education level, number of people in the household, and monthly household income). The second part of the questionnaire consisted of questions about consumer behavior and preferences toward wood flooring.

To assess responses regarding the decision-making process, a multiple-item Likert scale was employed, in line with Churchill’s (1997) [49] assertion that a single item may not adequately represent a broader concept. The scale ranged from 1 (not important) to 5 (very important), with intermediate options: 2 (somewhat important), 3 (neutral/indifferent), and 4 (important).

To enhance clarity and minimize potential confusion, the questionnaire underwent pre-testing and revision before distribution. The questionnaire was distributed in the Croatian language using snowball sampling, a non-probability sampling technique. The electronic version of the questionnaire was shared with respondents via social networks. This method was selected as it provided a cost-effective approach to data collection, enabled coverage across a wide geographical area, and facilitated low-cost data conversion [49–51]. The survey process started in Croatia in April 2022 and ended in May 2022, and 157 questionnaires were completed.

2.2. Statistical Data Analysis

The software JASP (version 0.19.1.0) [52] was used for the statistical analysis. Descriptive statistics for categorical variables were presented as percentages and visualized using horizontal or vertical bar charts. Likert-type data were displayed using diverging stacked bar charts. In all statistical analyses, a p -value below 0.05 was assumed to be statistically significant. The chi-square test for contingency tables or Fisher’s exact test (for 2×2 tables) was used to assess differences in responses based on gender, age, education level, household size, and monthly household income. Only statistically significant differences were reported. The Spearman correlation test was applied to examine the relationship between different questions. To determine the ranking of five floor coverings, the Borda count method was applied, based on individual rankings provided by respondents. The first-choice flooring option received 5 points, the second 4 points, the third 3 points, the fourth 2 points, and the fifth 1 point. The flooring type with the highest total score was ranked first.

Subjective and objective weights, obtained by consumers and experts, were used to determine the importance of the nine selected attributes of the wooden floor that influence the purchase decision. Consumers rated the wood flooring attributes on a Likert scale

from 1 to 5. The individual ratings were aggregated using the arithmetic mean. The average ratings were then divided by the sum of all average ratings to obtain the subjective consumer weights of the attributes with a sum of 1.

2.3. CRITIC and AHP

The CRITIC (CRiteria Importance Through Inter-criteria Correlation) method [53] leads to objective weights of the attributes on the basis of the information content of the attributes and the correlation between them. The Likert scale data collected from the consumers in the questionnaire were used. Attributes with a higher variability (higher value of the standard deviation) and lower interdependencies (calculated as the sum of the differences between 1 and the correlation coefficient) are assigned a higher weight.

To determine the expert weights of the multiple attributes that influence the purchase decision for a wooden floor, one of the multi-criteria decision methods should be used. We chose the analytic hierarchy process (AHP) [54], a well-known multi-criteria decision method based on pairwise comparisons. It has already been used in several studies on flooring selection [55–57]. AHP uses a 1–9 scale to pairwise compare all the attributes. Pairwise comparisons, which are summarized in a pairwise comparison matrix A , should be acceptably consistent with $CR < 0.1$, where $CR = CI/RI$, is the consistency ratio, $CI = (\lambda_{\max} - n)/(n - 1)$ is the consistency index, RI is the random index, and $\lambda_{\max}$ is the principal eigenvalue of matrix A .

The GSD-IJ method [58] was chosen to derive the group weights satisfactory to the experts. In the first step, the GSD-IJ method aggregates the individual pairwise comparison matrices into an interval group matrix. It adjusts the widths of interval judgments, taking into account the satisfaction of the experts and the uncertainty of the interval judgments. In the second step, fuzzy preference programming is used to derive the group weights of the attributes.

Fifteen experts were selected. The experts were a combination of practitioners and researchers with many years of experience and specialized knowledge in the fields of wood flooring, interior design, market analysis, and sustainable materials. The Excel template [59] was prepared to help the experts make pairwise comparisons.

2.4. Aggregation of Consumer and Expert Weights

In order to obtain the combined final weights of the attributes that influence the purchase decision for a wooden floor, the subjective weights obtained from consumers, the objective weights derived using the CRITIC method, and the expert-based subjective weights from the AHP were considered.

$$w_i^{\text{combined}} = \alpha w_i^{\text{experts}} + (1 - \alpha)(w_i^{\text{consumers}})^{\beta} (w_i^{\text{CRITIC}})^{(1-\beta)} \quad (1)$$

To combine the subjective and objective weights of consumers, we used a weighted geometric mean that reduces the weight when either $w_i^{\text{consumers}}$ or w_i^{CRITIC} is low, thus emphasizing the synergy between the high score of the attribute and the low correlation with other attributes. It balances both weights while reducing the impact of extreme values. To combine the weights of consumers and experts, we used the weighted arithmetic mean, which balances their contributions based on their relative importance. The coefficients $0 \leq \alpha, \beta \leq 1$ reflect the relative importance of weights. We chose $\beta = 0.7$ to emphasize the relatively higher importance of consumer preferences compared to the correlations between them and $\alpha = 0.5$ to highlight the equal importance of experts and consumers.

3. Results and Discussion

3.1. Respondent Profiles

The first part of the questionnaire consisted of questions that reflected the profile of the respondents who participated in the survey. One hundred and fifty-seven respondents participated in the survey and answered the questionnaire. Of the 157 respondents, 68.25% were female and 31.75% were male. Age was classified into four categories, while education was classified into three categories (Table 2).

Table 2. The consumer demographic characteristics.

Gender ¹		Education Level ¹		Age Level ¹	
Female	50.3	High school graduate	28.7	18 to 24 years old	1.3
Male	49.7	College graduate (B.Sc.)	56.7	25 to 34 years old	32.5
		Graduate degree (M.S./PhD)	14.7	35 to 65 years old	65.6
				Older than 65	0.6

¹ Percent of respondents; N = 157.

Most of the respondents (65.6%) were between 35 and 64 years of age, followed by the 25–34 age group (32.5%). Only 1.9% of respondents were aged between 18 and 24 years (1.3%) or over 65 years (0.6%). The educational background was determined based on 157 respondents. More than half (56.7%) had a college graduate degree, followed by those with a high school education (28.7%). Additionally, 14.7% of the respondents had completed a master's or doctoral degree. Most respondent households consisted of four members (29.9%), followed by two-person (26.1%) and three-person (25.5%) households. Single-person households were rare (5.7%), while larger households with five members (8.9%) or more than five (3.8%) were less common. Moreover, the majority of households (74.5%) reported a monthly income above 1500 euros.

3.2. Consumer Behavior and Preferences Toward Wooden Flooring

The second part of the questionnaire explored various factors influencing respondents' decisions when purchasing wood flooring. It focused on three key areas: preferences for flooring type and material, motivations behind their decision to buy wood floors, and the attributes that play a role in their purchasing choices.

3.2.1. Consumer Purchasing Behavior and Perception of Wood Flooring

The degree of importance of selected consumer behavior activities was assessed by respondents. As shown in Figure 1, among the 157 respondents, the highest level of agreement was recorded for the statement 'First, I collect information and ideas via the Internet and then I visit retail shops', with 52% strongly agreeing. Similarly, 38% was expressed for the statement that information is first sought online before a purchase decision is made. These results suggest that online research is considered a significant part of the consumer decision-making process when flooring is purchased. It is used to gather insights about flooring products before physical store visits are made; however, final transactions are still predominantly carried out in physical retail environments. On the other hand, despite the increasing role of online research, purchasing wood flooring products via the Internet was found to be relatively uncommon. The statement 'I buy via the Internet' received high levels of disagreement, with 39% strongly disagreeing and 23% disagreeing, while only 8% strongly agreed. This finding confirms that in-person purchases are still preferred by consumers, likely due to the need for tactile evaluation, professional consultation, or installation-related concerns. When considering in-store shopping behavior was examined more closely, a clear distinction was identified between consumers who prefer retail stores

for purchasing and those who use them primarily for information gathering. The statement ‘I shop exclusively in the retail shop’ received a strong positive response, with 36% strongly agreeing and 26% agreeing. However, for information gathering, only 9% strongly agreed that retail stores are primarily relied upon, while 42% remained neutral. This indicates that, although in-store purchasing is valued, consumers are increasingly turning to online sources during the initial stages of the decision-making process.

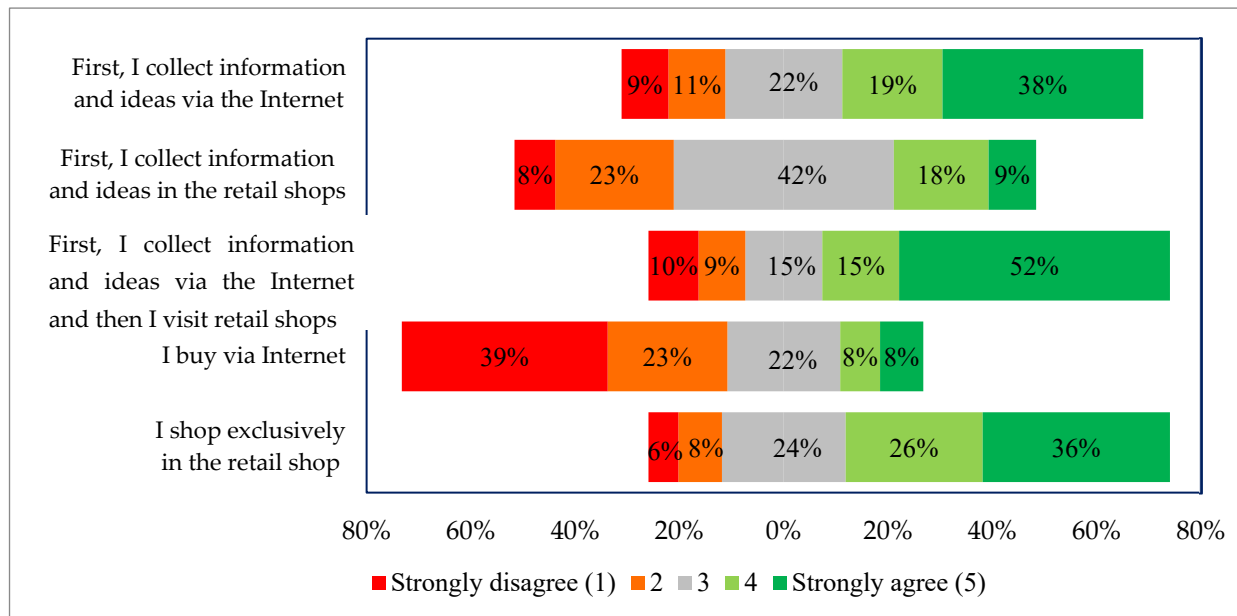


Figure 1. Consumer behavior activities for purchasing (N = 157).

In a subsequent analysis, statistically significant differences in consumer behavior related to online research and purchase decisions were identified based on gender and age. A statistically significant difference was observed between female and male respondents for the statement ‘First, I collect information and ideas via the Internet and then I visit retail shops’ ($\chi^2(4) = 11.719, p = 0.020$). It was found that 63% of women strongly agreed with the statement, compared to 41% of men, whose responses were more evenly distributed across other options. A significant difference was also observed between the two age groups (under and over 35 years) ($\chi^2(4) = 12.424, p = 0.014$), with younger respondents showing a greater tendency to agree with the statement. In addition, a higher percentage of younger individuals reported that flooring products were purchased online ($\chi^2(4) = 9.632, p = 0.047$). These findings indicate that online research is more frequently conducted by women and younger consumers, whereas a more varied approach is used by men and older respondents.

To enrich the study, additional questions were included to explore consumer perceptions of wood flooring, focusing on key aspects such as value, availability, maintenance, preferences, and sustainability—factors considered crucial in shaping purchase decisions and overall satisfaction.

As shown in Figure 2, 46% of respondents (28% agreeing, 18% strongly agreeing) stated that the higher price of parquet flooring is justified by its quality and appearance, while 19% (9% strongly disagreeing, 10% disagreeing) did not share this view. Based on this, parquet flooring is perceived as a premium product with an acceptable quality-to-price ratio.

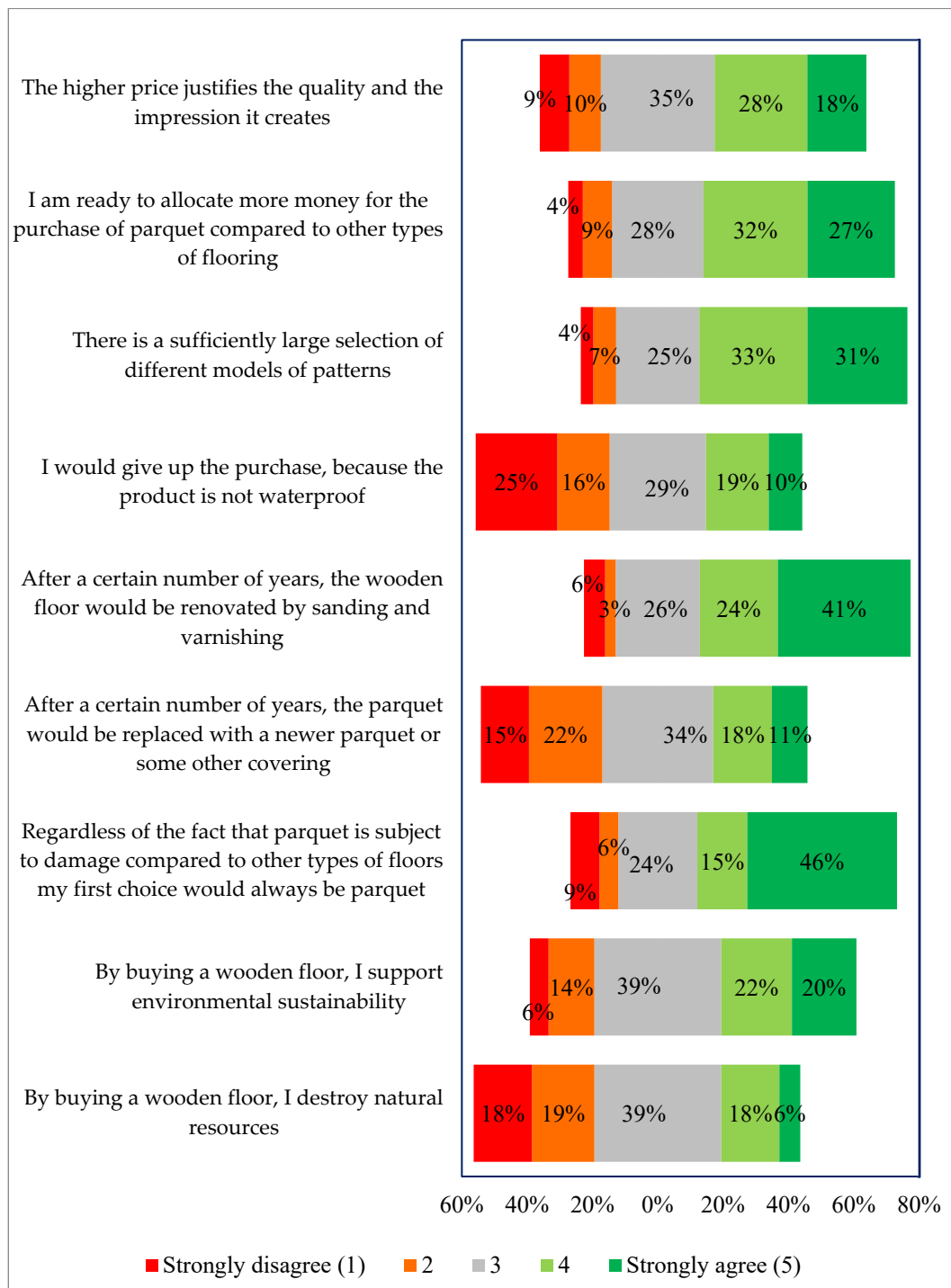


Figure 2. Consumer perception on wood flooring—value, availability, maintenance, preferences, and sustainability (N = 157).

A willingness to allocate more money for parquet flooring compared to other alternatives was expressed by 59% of respondents (32% agreeing, 27% strongly agreeing), while only 13% expressed unwillingness to pay the higher price. This indicates a positive market trend for parquet, suggesting that despite its higher price, consumers recognize its value and are prepared to invest in it.

This aligns with previous findings on residential decking, where price was less important than perceived quality and durability [60], as well as studies on timber in housing,

where price was relevant but not decisive, and timber frame houses were often not seen as cost-effective despite their positive image [61].

Furthermore, a wide variety of parquet models and patterns was recognized by 64% of respondents, while only 11% considered the selection insufficient. One recurring concern identified among respondents was the lack of water resistance. It was noted that 41% of respondents would not be discouraged from purchasing due to this drawback, whereas 29% stated that the absence of waterproofing would prevent them from buying wooden flooring. These results suggest that parquet continues to be a preferred flooring option due to its aesthetic appeal and versatility, despite the perceived limitations in water resistance.

When renovation and replacement were considered, it was found that 65% of respondents acknowledged the need for periodic maintenance, such as sanding and varnishing, with 41% strongly agreeing and 24% agreeing. Similar to findings related to residential decking materials, maintenance was not the most important factor but was still viewed as a relevant concern when choosing wooden interior surfaces [61].

Additionally, 29% of the respondents strongly agreed or agreed that wooden parquet would eventually be replaced with a newer version of parquet or another type of wood flooring, while 34% remained neutral on this issue. However, a significant portion (37%) disagreed with the statement that after a certain number of years, the parquet would be replaced with a newer parquet or some other covering, which further reinforces consumers' perception of its durability. This insight aligns with previous research that indicates durability is a crucial factor in consumer choice and that perceptions regarding the longevity of timber as a construction material are common [60,62,63].

Despite its susceptibility to damage compared to other flooring options such as tiles and vinyl, wood flooring is still preferred by the majority of consumers when price is not considered a determining factor. A strong preference for wood flooring was observed, with 61% of respondents expressing a favorable opinion (46% strongly agreeing, 15% agreeing) despite its potential for wear and tear. In contrast, only 15% (9% strongly disagreeing, 6% disagreeing) were found to oppose this view, indicating that concerns about durability are not considered a significant influence on purchasing decisions. These findings suggest that aesthetic appeal, comfort, and other perceived benefits outweigh durability concerns for most buyers. This is consistent with earlier studies showing that consumers strongly associate solid wood with positive attributes such as naturalness, warmth, and quality, and tend to prefer it over more processed wood-based materials despite potential practical drawbacks [64] (Jonsson et al., 2008).

Statements regarding the environmental impact of parquet flooring were found to be divided. While 42% of the respondents (22% agreeing, 20% strongly agreeing) believed that purchasing parquet supports environmental sustainability, 20% (6% strongly disagreeing, 14% disagreeing) did not perceive it as an environmentally friendly option. These results indicate that greater awareness is needed regarding sustainable sourcing and responsible forestry practices.

Concerns about parquet contributing to environmental degradation were also expressed with mixed views. While 24% of respondents (18% agreeing and 6% strongly agreeing) believed that parquet contributes to the destruction of natural resources, 37% did not associate it with environmental harm (18% disagreeing and 19% strongly disagreeing). These findings suggest that although moderate environmental concerns are expressed by some consumers, sustainability considerations are not regarded as major deterrents in purchasing decisions. Differences in consumer views on environmental aspects of wood products have been identified in earlier research. It has been observed that while some consumers are willing to pay more for certified wood products, others remain unconvinced of their sustainability benefits [65]. The image of wood as an eco-friendly material has

been found to depend largely on awareness and information levels [62]. These patterns are reflected in our results, where parquet's environmental value was questioned by part of the respondents. Similarly, Lahinen et al. (2020) [10] found that young adults in Finland associated wood with health and sustainability, but also demonstrated limited knowledge of its actual environmental impact.

An analysis emphasized a statistically significant difference between the responses of women and men for the statement. By 'buying a wooden floor, I support environmental sustainability' ($\chi^2(4) = 11.066, p = 0.026$). Agreement (a rating of 3 or higher) was recorded among 90% of women and 71% of men. Furthermore, a statistically significant difference was observed between two age groups (under and over 35 years) regarding the statement 'By buying a wooden floor, natural resources are destroyed' ($\chi^2(4) = 10.050, p = 0.040$). Agreement (a rating of 3 or higher) was more commonly expressed by younger respondents (77%) than by older respondents (56%).

Respondents were asked to select their preferred type and material for floor covering when decorating an interior, under the assumption that all flooring options were priced equally.

In Figure 3, the total scores assigned using the Borda count method are presented, showcasing the ranking of various flooring types and materials based on respondent preferences. The Borda count method is used to rank options based on the cumulative scores that were assigned by respondents, thereby reflecting preferences in a weighted manner [66].

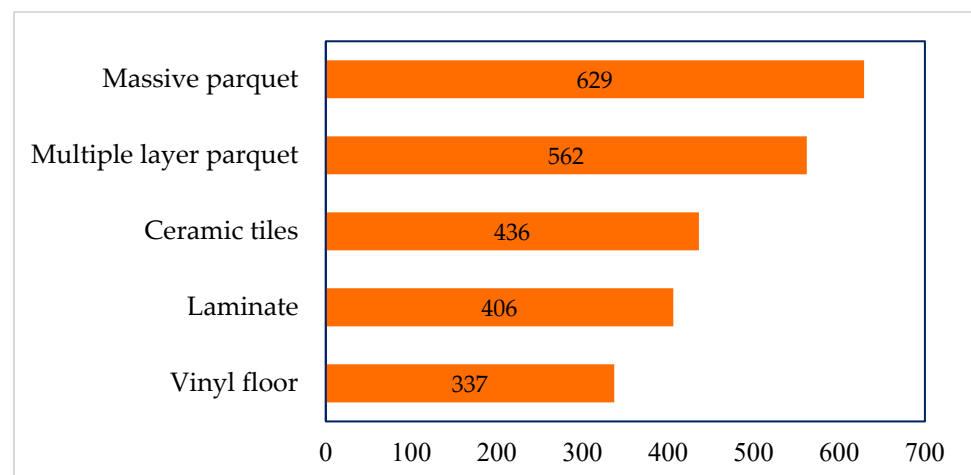


Figure 3. The sum of points from the Borda count method for a floor covering type and material (N = 157).

A strong preference for wood flooring was revealed by the results, with wood massive parquet being awarded the highest score (629 points), thereby making it the most favored option. This was followed by wood multiple-layer parquet (562 points), further confirming the popularity of wood flooring among consumers. Our findings are supported by research conducted by Wallius et al. (2023) [67], where wood-based materials in the built environment were perceived by stakeholders as competitive alternatives to conventional non-wood products. Among alternative materials, ceramic tiles were ranked third with 436 points, indicating their continued appeal as a non-wood flooring option. Laminate flooring (406 points) was moderately preferred, while vinyl flooring was scored the lowest (337 points), suggesting it is the least favored choice among respondents. Based on these findings, it is shown by previous research that natural wood flooring is often chosen over other materials due to its high quality and long-lasting durability. For example, it was found by Roos and Hugosson (2008) [68] that massive and multiple-layer parquet is espe-

cially popular. It was also reported by Jiménez et al. (2016) [69] that both the emotional appeal and the visual attractiveness of wood flooring are considered important in consumer preferences. Furthermore, it was noted by Cha et al. (2009) [70] that extra payments for certified, sustainable wood products are willingly made by many consumers, thereby emphasizing the material's lasting value. Finally, it was demonstrated by Mao et al. (2024) [71] that the choice of floor material, together with other design features, has a strong influence on how a space is viewed and felt, thus supporting the dominant consumer preference for wood flooring.

3.2.2. Consumer Preferences for Wood Flooring Attributes

A selected factor influencing wood flooring preferences, such as wood flooring type, pattern, traditional versus unconventional designs, and color tones, is presented in Table 3.

Table 3. Summary of consumer choices regarding different wood flooring attributes.

Aspect Assessed ¹	Most Selected Option ¹		Alternative Option ¹	
Wood flooring type (parquet)	Classic massive parquet	55	Multilayer parquet/Lamell parquet	39/6
Top-layer pattern	One strip	66	Three strip	34
Classic vs. unusual design	Classical look	82	Unusual look	18
Color tones of top layer	Bright tones	64	Dark tones	36

¹ Percent of respondents; N = 157.

The analysis of respondents' preferences for different types of wood flooring was conducted, and a strong inclination toward classic massive parquet was revealed. A majority of respondents (55%) expressed a preference for classic massive parquet. Multilayer parquet was identified as the second most preferred option, being selected by 39% of respondents. This result suggests that engineered wood flooring is widely accepted, potentially due to its practical benefits such as improved stability, resistance to moisture, and a more cost-effective alternative to solid wood. The least popular choice was found lamell parquet, preferred by only 6% of respondents. A clear preference for one-strip parquet (66%) over three-strip parquet (34%) was indicated by respondents.

The results demonstrate a strong preference for traditional parquet designs, with 82% of respondents favoring the classic look. This preference is believed to reflect the value placed on timeless aesthetics, versatility, and the ability to complement various interior styles. Conversely, only 18% of respondents indicated a preference for unconventional parquet forms, suggesting that modern or bold designs are appealing to a niche consumer segment seeking contemporary aesthetics or statement flooring options.

The analysis of respondent preferences for parquet color tones revealed a strong inclination toward bright tones, with lighter shades being favored by 64% of respondents. However, 36% of respondents expressed a preference for darker tones, indicating considerable market interest in deeper, richer wood colors.

Additionally, since oak has traditionally been used as one of the most common wood species in the flooring industry, both in Croatia and globally, respondents were asked to indicate their preferences for wood flooring options excluding oak. This approach was taken to better understand consumer interest in alternative wood species and potential market demand for more diverse materials. Our approach is supported by previous research, which has shown that the most desirable floor type is oak with an ecolabel and a warranty [68].

As illustrated in Figure 4, distinct trends in consumer preferences for alternative wood species were observed. While oak, especially when ecolabeled and under warranty, was identified as the most preferred flooring species by Roos and Hugosson (2008) [68], prefer-

ences beyond oak were explored in our study. Our results reveal a growing consumer interest in alternative wood species. Walnut was selected as the top non-oak choice by 45% of respondents, while ash was chosen by 17%. These findings align with Chen et al. (2014) [72], who found that *Juglans nigra* (walnut) was highly rated in terms of classical and practical appearance. Although ash was identified as the second most frequently selected wood flooring option in our study (excluding oak), surpassing traditional species such as beech, maple, and cherry, it was ranked among the lowest-rated species in the study by Dai et al. (2023) [73], where aesthetic impressions were evaluated based on texture and color.

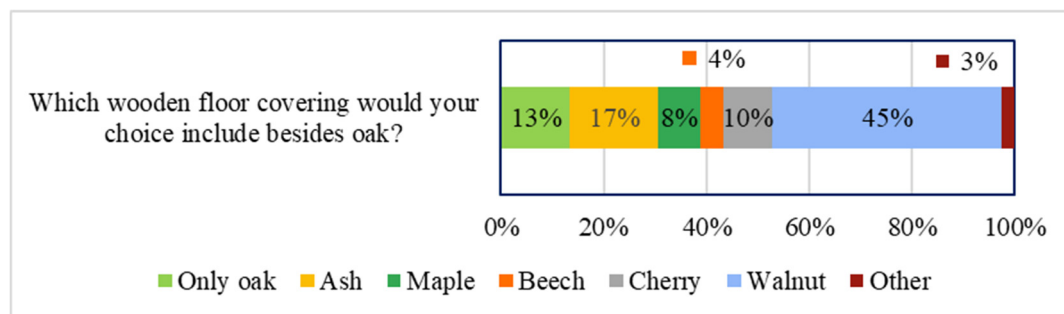


Figure 4. Consumer preferences for wood flooring choices beyond oak (N = 157).

In contrast, only 13% of respondents indicated a preference for oak exclusively, suggesting loyalty to traditional materials. Maple was less preferred, with 8% selecting it, and cherry was chosen by only 4%. This finding is consistent with previous research, where these species, despite having some positive visual attributes, were ranked lower due to their perceived lack of durability and performance. Beech was moderately preferred, receiving 10% of responses, while only 3% of respondents selected ‘Other,’ indicating minimal interest in less common wood species.

An additional analysis regarding flooring type, pattern, design style, and color tone was conducted, and statistically significant differences between monthly household income groups were identified for the top-layer pattern of parquet ($\chi^2(3) = 9.178$, $p = 0.027$). Three-strip flooring was preferred by respondents with lower income (<1000 EUR), while respondents with higher income tended to prefer one-strip options. Furthermore, classical parquet design was preferred more by men (89%) than by women (75%) (Fisher’s exact test = 0.366, $p = 0.033$). Among respondents who preferred classic massive or multilayer wood flooring, 70% also preferred one-strip top layers. In contrast, 89% of those who preferred lamell flooring chose three-strip patterns ($\chi^2(2) = 13.097$, $p = 0.001$). Additionally, among those who favored bright top-layer tones (Q13), walnut (35%) and ash (31%) were preferred after oak (70%), while among those who favored dark tones, walnut was overwhelmingly selected (83%) ($\chi^2(7) = 32.217$, $p < 0.001$).

An analysis of differences in preferences for specific wood flooring attributes was carried out, providing deeper insight into end-user attitudes. Respondents were asked to rate various wood flooring attributes using a 5-point Likert scale (where 1 indicates ‘not important at all’ and 5 indicates ‘extremely important’). In Figure 5, the attitudes of respondents are displayed, covering attributes such as product quality, visual impression, durability and maintenance, natural feeling, liability for damage, price, sustainability, installation, and prestige.

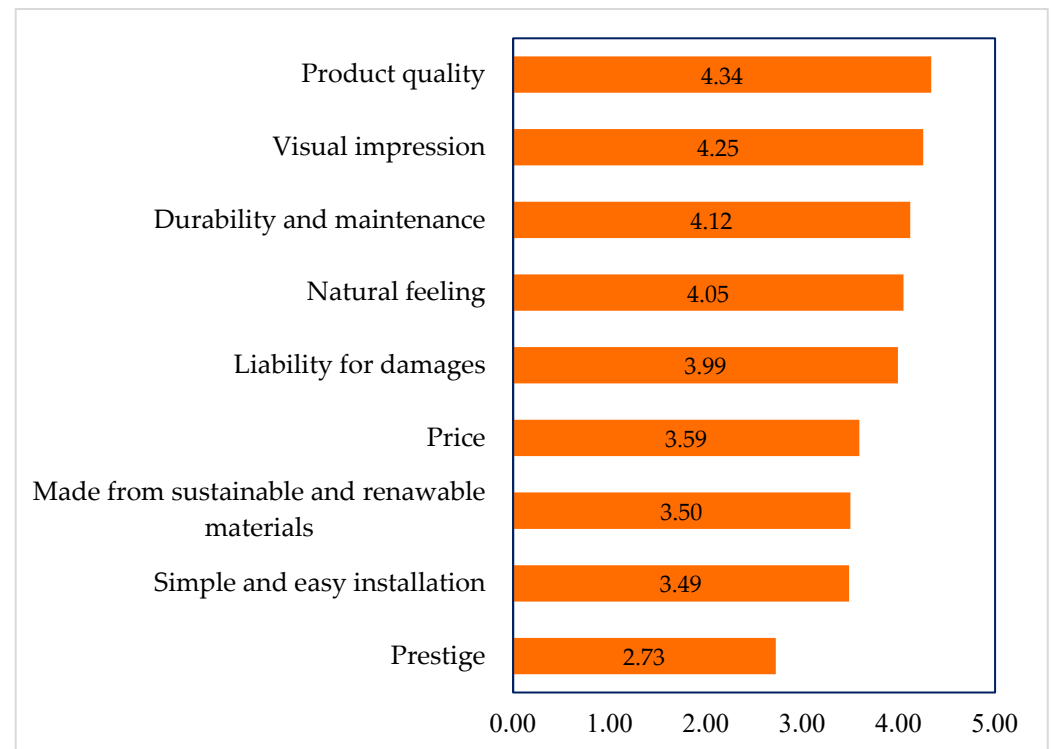


Figure 5. Consumer preferences for wood flooring attributes (N = 157).

It was found that ‘product quality’ was rated as the most important attribute ($\bar{x} = 4.34$), followed by ‘visual impression’ ($\bar{x} = 4.25$), ‘durability and maintenance’ ($\bar{x} = 4.12$), and ‘natural feeling’ ($\bar{x} = 4.05$). Liability for damage was also rated highly ($\bar{x} = 3.99$), indicating awareness of potential repair issues. Although ‘price’ was considered an important attribute ($\bar{x} = 3.59$), it was not perceived as the primary factor. Similarly, ‘sustainability’ (mean = 3.50) and ‘ease of installation’ ($\bar{x} = 3.49$) were rated as moderately important, suggesting that while eco-friendliness and convenience influence consumer choices, they are not viewed as critical drivers. In contrast, ‘prestige’ was rated as the least important attribute ($\bar{x} = 2.73$), indicating that brand status and exclusivity are not considered major influences in flooring selection. These findings are largely consistent with earlier research, where consumer preferences were found to be shaped mainly by floor type, particularly wood species and visual impression, as well as quality and price [68]. While environmental certification was included in their analysis due to increased interest in ecolabeling, sustainability was considered important in our study but was not ranked among the top attributes.

An additional analysis was conducted, and statistically significant differences were identified between the responses of women and men regarding the attribute liability for damages ($\chi^2(4) = 10.144$; $p = 0.038$). This criterion was assessed as very or extremely important by 83% of women and 61% of men. Furthermore, the responses of participants who selected wood flooring (massive parquet or multilayer parquet) as their first choice were compared with those who selected non-wood flooring options (ceramic tiles, laminate, or vinyl). The only statistically significant difference was observed in the attribute natural feeling (78% vs. 63%) ($\chi^2(4) = 14.784$; $p = 0.005$).

To explore the connections between different attributes of wooden flooring influencing consumer purchasing decisions, Spearman’s correlation coefficients and p -values were calculated. As shown in Table 4, a very strong correlation was found between ‘liability for damages’ and ‘durability and maintenance’ ($r_s = 0.809$; $p < 0.001$), as well as between ‘natural feeling’ and ‘durability and maintenance’ ($r_s = 0.701$; $p < 0.001$).

Table 4. Spearman’s correlation coefficients between wood flooring attributes that influence purchase decisions (N = 157).

		Price	Quality	Visual Impression	Liability for Damages	Durability and Maintenance	Simple and Easy Installation	Natural Feeling	Prestige
Quality	r_s	0.47 ***							
	p	<0.001							
Visual impression	r_s	0.441 ***	0.680 ***						
	p	<0.001	<0.001						
Liability for damages	r_s	0.466 ***	0.652 ***	0.554 ***					
	p	<0.001	<0.001	<0.001					
Durability and maintenance	r_s	0.476 ***	0.683 ***	0.616 ***	0.809 ***				
	p	<0.001	<0.001	<0.001	<0.001				
Simple and easy installation	r_s	0.398 ***	0.414 ***	0.466 ***	0.672 ***	0.691 ***			
	p	<0.001	<0.001	<0.001	<0.001	<0.001			
Natural feeling	r_s	0.330 ***	0.605 ***	0.617 ***	0.639 ***	0.701 ***	0.599 ***		
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Prestige	r_s	0.089	0.107	0.186 *	0.123	0.139	0.273 ***	0.224 **	
	p	0.268	0.181	0.02	0.128	0.082	<0.001	0.005	
Sustainable and renewable materials	r_s	0.265 ***	0.377 ***	0.446 ***	0.554 ***	0.560 ***	0.493 ***	0.551 ***	0.168 *
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.038

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The attribute quality was found to be strongly correlated with ‘visual impression’ ($r_s = 0.680$; $p < 0.001$), ‘liability for damages’, ‘durability and maintenance’ ($r_s = 0.683$; $p < 0.001$), and ‘natural feeling’ ($r_s = 0.605$; $p < 0.001$). Additionally, ‘price’ was identified as strongly correlated with several other attributes; however, the Spearman correlation coefficients were recorded as being below 0.5.

As most wood flooring is exported, primarily to the EU, previous studies were reviewed to better understand the broader context. The study by Harju and Lahinen (2021) [28] from Finland confirmed the importance of aesthetics and natural characteristics of wooden flooring, which is consistent with our results. Furthermore, research conducted by Bysheim et al. (2016) [39], which covered Norway, Austria, Sweden, and France, emphasized the relevance of wooden floors for users’ well-being. A study conducted in Germany by Gold and Rubik (2009) [60] also supported our findings, demonstrating that although price and sustainability are recognized as important factors, they are rarely crucial in purchase decisions. The Tretetnisk (2016) [39] study, which included Norway, Sweden, Finland, Austria, and France, confirmed the value of naturalness and aesthetics in wooden interior materials. Wood was perceived as a material that contributes to comfort and well-being by participants, which is in line with Croatian consumers’ preferences for natural and visually appealing wooden floors. A comprehensive literature review about wood products perception conducted by Wallius et al. (2022) [67] highlighted that, although wood is perceived as attractive and environmentally friendly, concerns remain regarding cost and maintenance, and thus increased education and access to information were recommended. Our research, alongside comparisons with other studies, can assist manufacturers in better aligning their product ranges with the needs of both domestic and international markets.

3.3. Understanding Differences Influencing Wood Flooring Purchase Decisions—Wood Flooring Consumer and Wood Industry Expert Perceptions

To understand the differences in consumer and expert perceptions of wood flooring attribute preferences, an analysis was conducted to examine the weights of various attributes influencing purchasing decisions. Different evaluation methods were utilized in this analysis to provide a comprehensive perspective on the attributes that drive consumer choices in the wood flooring market. The attributes were assessed using the following approaches: subjective consumer weights, which were derived from survey responses reflecting individual preferences; subjective expert weights, which were determined using the Analytical Hierarchy Process (AHP), representing professional evaluations; and objective consumer weights, which were calculated using the CRITIC method, a statistical

approach to evaluating the importance of attributes based on data correlations and variability. Additionally, a synthesis of the aforementioned methods was performed to provide a balanced perspective on the relative importance of each attribute.

A comparison between respondents' weights and experts' weights of attributes, as shown in Figure 6, was performed, and it was revealed that greater importance was assigned by experts to 'product quality' (19%), 'liability for damages' (17%), and 'durability and maintenance' (17%). Additionally, 'price', 'prestige', and 'simple and easy installation' were assigned less importance by experts in comparison to consumers.

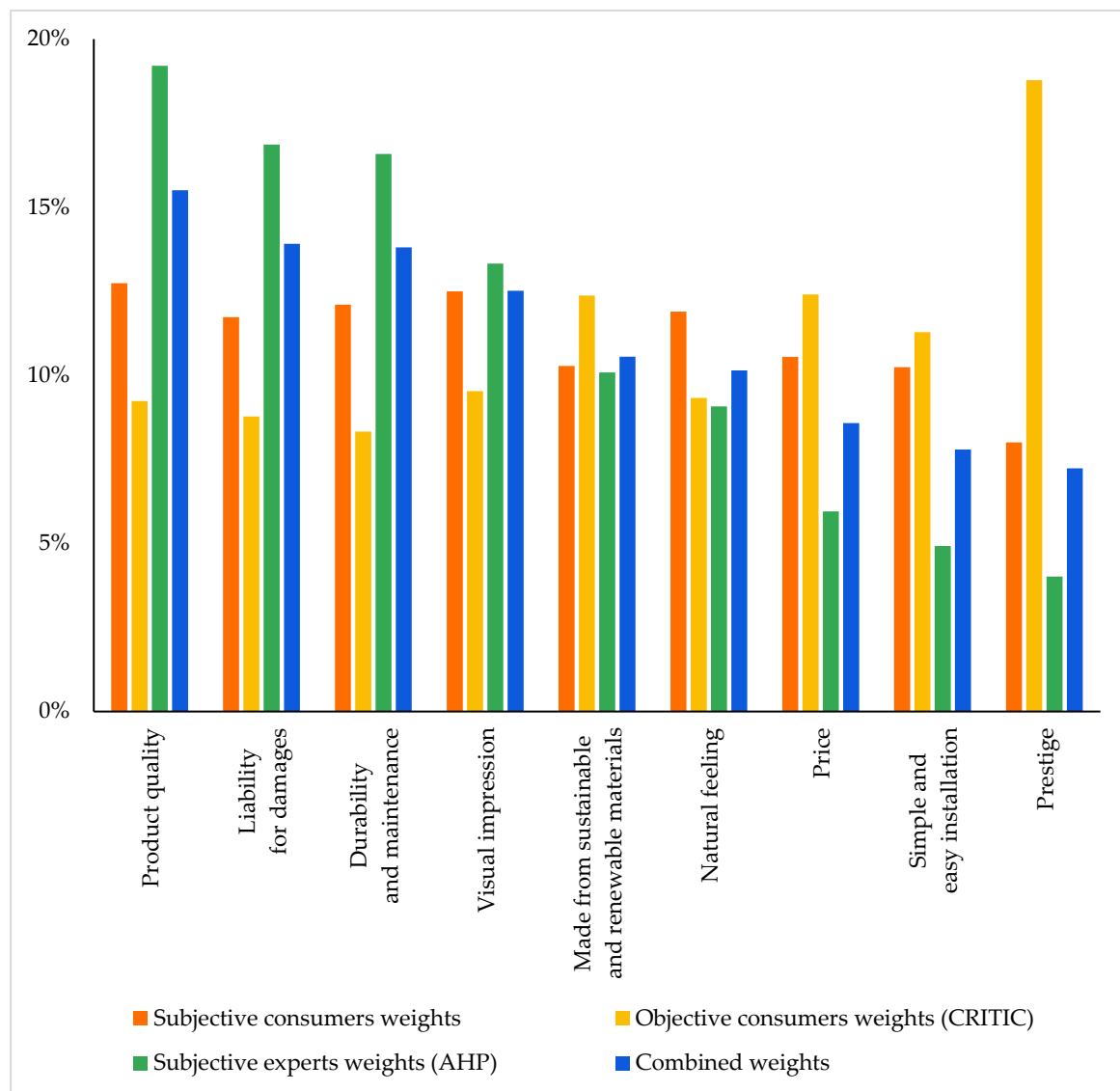


Figure 6. Weights of attributes that influence the purchase decision for wood flooring, determined by consumers, experts, and combined.

In addition to differences in perception, further differences were found to result from the methodologies applied. Likert scale ratings were observed to produce more consistent outcomes than AHP-derived weights, in which pairwise comparisons of attributes were made by experts. The combined weights were derived by aggregating the three types of weights.

The ranking of the attributes was retained from the expert evaluations; however, the individual weights were modified through the aggregation process. As shown in Figure 6, 'product quality' (15.5%) was ranked first, indicating that this attribute was consistently

rated as the most important by both experts and consumers. The importance of ‘product quality’ was reflected in its association with durability, low susceptibility to damage, visual appeal, natural feel, and higher price. These characteristics resulted in a high correlation with other attributes, which, in turn, led to a lower CRITIC weight and consequently reduced its overall aggregated weight.

‘Product quality’ was followed by ‘liability for damages’ (13.9%) and ‘durability and maintenance’ (13.8%). Both attributes were assigned the lowest CRITIC weights due to their high correlation with other factors. However, their high subjective weights—particularly those assigned by experts—resulted in their placement in second and third positions. The attribute ‘prestige’ was ranked last (7.2%). Although its CRITIC weight was identified as the least correlated with other attributes, the extreme value was moderated through the use of the geometric mean in the aggregation formula.

4. Conclusions

Emerging trends in wood flooring reflect a growing consumer demand for sustainability, natural aesthetics, and innovative design solutions. The industry is increasingly focused on the use of eco-friendly materials and warm-toned woods that bring a sense of comfort and authenticity to interior spaces. In order to understand how these trends are reflected in the Croatian market, this study analyzes the perspectives of consumers and experts on various attributes of wooden flooring, combining survey results with multi-criteria decision-making methods.

In line with the study’s main objectives, exploring consumer preferences, purchase-related activities, influential product attributes, and differences in perception between consumers and experts, this research provides several key insights.

The findings reveal a strong and consistent consumer preference for classic, natural wood flooring, especially massive and multilayer parquet, driven by aesthetic value, perceived quality, and durability. Respondents, predominantly middle-aged and well educated, showed a high reliance on online research before making purchasing decisions, although final purchases were mostly made in physical stores, reflecting the importance of tactile evaluation and in-person consultation. Significant differences were observed based on gender and age, with women and younger consumers more inclined toward using the Internet for product research and more open to online purchases.

Despite the higher cost, wood flooring is perceived as a worthwhile investment, with many respondents justifying its price due to quality and appearance. Consumers also showed a clear preference for traditional designs, one-strip patterns, and light color tones, indicating a market leaning toward timeless, versatile styles. Walnut and ash emerged as popular alternatives to oak, suggesting growing interest in diverse wood species.

While maintenance needs and lack of water resistance were recognized, these did not significantly deter consumers. In contrast, attributes such as product quality, visual impression, durability, and natural feel were rated as most important, whereas price, sustainability, and prestige held lesser influence. Interestingly, sustainability was appreciated but not prioritized, reflecting a need for increased awareness about environmentally responsible flooring options.

The comparison between consumer and expert evaluations revealed alignment on key attributes such as quality and durability, though experts placed less emphasis on price and prestige. The integration of subjective and objective evaluation methods (including AHP and CRITIC) provided a comprehensive understanding of the importance of different product attributes. The results based on combined weights indicate that the most important attribute is product quality (15.5%). Liability for damages (13.9%) and durability and maintenance (13.8%) are also ranked very highly. Visual impression, natural feeling, and

made from sustainable and renewable materials are moderately ranked. The lowest-ranked attributes are price (8.6%), simple and easy installation, and prestige (both below 8%). The applied combination of survey-based data and multi-criteria decision-making techniques represents a methodological contribution, as such an integrated approach has not yet been used in studies on wooden flooring.

Overall, the study confirms a positive market trend toward wooden flooring, particularly parquet, emphasizing quality, aesthetic appeal, and traditional design. For manufacturers and retailers, these insights provide a valuable foundation for product development, targeted marketing strategies, and enhanced consumer education—particularly in the areas of sustainability, material diversity, and digital engagement. Furthermore, the rise of smart flooring solutions, including temperature regulation and sensor-based features, illustrates how flooring is evolving to enhance both the functionality and comfort of modern living environments. These developments signal a dynamic future for the wood flooring market, where tradition meets innovation.

Although the findings provide a useful understanding of customer preferences regarding wooden flooring, a limitation of this study is that it was conducted only in Croatia. Given the significant export of Croatian wooden flooring, it would be useful to conduct similar research in key foreign markets, and our results may serve as a foundation for future studies.

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