

## Article

# How Consumer Environmental Responsibility Affects the Purchasing Intention of Design Furniture Products

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**Abstract:** Consumer environmental responsibility has been commonly considered as an antecedent to green consumption intention and eco-design purchases. However, little research has investigated how environmental concern affects the relationship between design attributes and purchasing intention, especially in the furniture setting, where companies are often involved in design-intensive processes and environmental problems. This study investigates (i) how consumers perceive the different dimensions of design and which attributes most affect their purchasing intention of furniture items; and (ii) the role of consumers' environmental responsibility on the relationship between design attributes and purchasing intention. An online questionnaire survey was employed to collect data from 350 Italian consumers. The findings reveal that design can be intended as a three-dimensional construct, based on functional, aesthetic, and symbolic attributes. While functional and aesthetic features can be considered as relevant factors affecting the consumers' perception of design, the purchasing intention is mainly influenced by the symbolic dimension of design. Moreover, environmental concern moderates the relationship between the symbolic dimension of design and purchasing intention, that is, when consumers are highly concerned about environmental issues, they tend to be more influenced by the symbolic dimension of design. Several theoretical and practical implications are discussed.

**Keywords:** furniture design; consumer environmental responsibility; purchasing intention; consumer behavior



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## 1. Introduction

Over the last decades, a number of studies highlighted the critical role of design in affecting consumers' behavior, especially concerning purchasing intention [1–5]. Design attributes that are in line with consumers' needs and expectations, indeed, can lead to highly satisfying experiences, thus improving the positive relationship between the companies' offering and the consumers' demand [6]. Nevertheless, individuals' daily interactions with products can result in subjective perceptions of design attributes, thus producing diverse responses [7]. Moreover, several dimensions of design, concerning functional, aesthetic, and symbolic features of a product, can affect the consumers' attention and behaviors in different ways [8–10]. Hence, the relationship between design and purchasing intention is still contradictory, especially in relation to the furniture sector, on which extant literature seems to be particularly sparse.

Prior studies mainly focused on the above relationship regardless of the product category [11–16], while others focused on specific contexts, such as cosmetics [4], luxury brands [3], and automobiles [5]. However, except for a few studies [17,18], the furniture setting has been rather ignored to date. Studies by Bumgardner et al. [19] and Guzel [20], for instance, emphasized the importance of product image in the furniture industry, thus highlighting the relevance of design. Nevertheless, none of them investigated the relationship between product image (or design) and purchasing intention.

A further concern relates to the increasing attention of consumers towards environmental issues [21] and the role of eco-design practices for companies' innovation and competitiveness [22]. As noted by Yue and colleagues [23], consumer environmental responsibility (CER) derives from the norm activation model, originally developed in the social-psychology field. It claims that responsibility is an individual's moral quality that drives altruistic behavior [24]. Some scholars explored the antecedents of this concept, including environmental education [25] and perceived product necessity [26], while others put the attention on its consequences by integrating environmental responsibility into the theory of planned behavior [27,28]. In this respect, past research found a positive relationship between CER and both pro-environmental behavior [28] and green consumption intention [29]. Overall, the growing consciousness about the environment has been often associated with consumers' willingness to buy eco-friendly-labeled products, also with regard to the furniture context [30,31]. Prior contributions of Bednarick et al. and Papadopoulos [32,33], for example, empirically demonstrated that consumers' environmental responsibility moves them to purchase eco-friendly furniture products, thus improving their overall purchases. Yet, despite this evidence, very little attention has been devoted to the relationship between CER and consumers' behavior towards design furniture products. Even if a scarce number of studies demonstrated the positive attitudes of environmentally responsible consumers towards eco-design practices [34,35], the generalization of these findings to the overall furniture setting still remains unsettled.

Starting from these assumptions, the present study aims at addressing two main research questions: (RQ1) How do consumers perceive the different dimensions (functional, aesthetic, and symbolic) of design and which attributes most affect their purchasing intention with regard to furniture items? (RQ2) What is the role of consumers' environmental responsibility on the relationship between design attributes and purchasing intention? The above questions fall into the overall aim of understanding whether and how individual concern towards environmental issues can affect the perception of design attributes and the purchasing intention of design furniture products.

Understanding how consumers perceive the design concept and its effects during the purchasing processes can be useful for furniture companies to identify the key factors on which they should focus to attract consumers and satisfy their needs. Moreover, by addressing the role of environmental responsibility on consumers' behavior, useful insights can be gained to understand the economic convenience for companies to invest in environmental strategies, including eco-design practices, in order to improve their market shares and competitiveness.

The rest of the paper is structured as follows. Section 2 provides a theoretical background of the main constructs involved in this study along with the hypotheses developed. Methodology, sampling procedure, and data processing are described in Section 3, while Sections 4 and 5 present the main findings and their discussion, respectively. Finally, Section 6 presents conclusions, limitations, and lines for future research.

## 2. Theoretical Background

### 2.1. Purchasing Intention

The construct of purchasing intention has received great attention from both academics and practitioners. According to Wee and colleagues [36], the intention is the cognitive representation of the will to adopt a certain behavior. Notably, Mirabi et al. [37] pointed out that this construct can be defined as a situation in which consumers are more likely to buy some products depending on particular circumstances, and to repeat this purchase in the future, while resisting the switch to other brands [38].

Several authors from different sectors, such as the automotive industry [39] and social media advertising [40], have analyzed this concept by adopting a behavioral approach and identified different variables aimed at measuring consumers' willingness to purchase a specific good or service. The results of Jalivand and colleagues [39], in particular, revealed that brand awareness, brand loyalty, and perceived quality of products have a significant

impact on purchasing intention. More recently, Alalwan [40] underlined the role of hedonic motivations, habits, and perceived relevance. The theory of reasoned action [41] and the theory of planned behaviour [42] also argued that several factors, including individuals' attitudes and beliefs, can be regarded as predictors of purchasing intention.

Overall, the number and variety of these findings suggest that consumers' decision-making processes are very complex in nature. Moreover, there is still an open and controversial debate on the relationship between intention and behavior. While some scholars [36,43] argued that consumers' intentions do not necessarily translate into purchasing behavior, others [44,45] pointed out that the greater the intention is, the greater will be the likelihood that a consumer will buy a certain product. The second perspective has been widely accepted by managers, who tend to consider purchasing intention as one of the main indicators to assess the consumers' response to products, especially when companies are planning to launch new ones [43]. In this regard, a better understanding of consumers' purchasing intention can be very helpful for companies to improve the comprehension of the market demand and, consequently, to affect the overall consumers' buying processes.

Based on the above literature, purchasing intention has been considered, in this study, as a predictor of consumers' buying behavior with the aim of investigating how design attributes of a furniture product can affect such behaviors.

## 2.2. Design

The strategic role of design for companies' innovation and competitiveness has gained increasing recognition among scientists and researchers over the last decades. Several scholars [2,46,47] proved that investments in design have a positive impact on companies' ability to innovate and, consequently, on their competitive performances. However, a common and accepted definition of design has not been identified yet [7,48]. Some authors [49,50] considered it as a human activity, which includes both the dimensions of creativity and technique. Additionally, design has been considered as a strategic tool that can improve the product's functionality as well as its aesthetic characteristics [51]. A further stream of research [52–54] characterized design by simply focusing on one dimension at a time, while others [9,10] considered it as a multi-dimensional construct, mainly including aesthetic, functional, and symbolic attributes. Over the years, the multi-dimensional construct of design has been increasingly adopted by researchers [10], thus it has been accepted also in this study.

As for the relationship between design attributes and purchasing intention, past research [2,8] demonstrated that a product design which is consistent with consumers' needs and expectations can influence their behaviors. Notably, Hanzae and Andervazh [4] found a positive relationship between design attributes and purchasing intentions of cosmetics. Similar results were obtained in the luxury sector [3] and the automotive industry [5]. More generally, Arboleda and Alonso [11] showed that design awareness, defined as the ability of consumers to recognize the attributes that have been incorporated into an object for instrumental and/or symbolic purposes, can be considered as a valid explanation of their purchasing intentions.

Concerning the specific dimensions of design early proposed by Homburg and colleagues [10]—i.e., aesthetic, functional, and symbolic—their effects on consumers' behaviors have been scarcely investigated by prior research. Hence, the authors' study [10] can be considered as a first step in this direction. More specifically, they found that the aesthetic features of design directly influence consumers' evaluations and, consequently, their desire to own the product as well as their decision to buy it [12,13]. Similarly, the functional attributes—regarded as “a reliable indicator of functional performance” [14] (p. 346)—can also improve the likelihood of purchase. Finally, the symbolic dimension, intended as the set of meanings associated with the product, affect the consumers' behavior, since individuals are highly aware of their social identity and, therefore, they may be more likely to buy design objects that allow them to elevate their social status and/or to maintain their self-concept.

Overall, the literature on this topic suggests the existence of a positive relationship between the perception of design attributes and the consumers' purchasing intention, also with regard to the millennial generation. Chamorro et al. [55], for example, demonstrated the important influence of design on young consumers' choice in the wine industry, while other studies revealed the existence of a positive relationship between design and both satisfaction [56] and perception [57], which improve the willingness to buy design products. However, to the authors' knowledge, no contributions have been found concerning the specific context of the furniture sector. Based on previous evidence, it is likely to suppose that a similar relationship may occur also in this setting, as proposed by the first hypothesis of this study:

**Hypothesis 1 (H1).** *The perception of design attributes positively influences the purchasing intention of design furniture products.*

Notably, according to Homburg and colleagues [10], it is likely to suppose that the effect of the symbolic dimension of design on purchasing intention could be greater than that of the functional and aesthetic ones, as furniture products enable consumers to express their self-identities. A prior study by Bumgardner and Bowe [19], indeed, stressed the importance of product image and moving beyond a commodity mentality in the furniture industry. That is, consumers seem to ground their purchasing decision on the extent to which a furniture product communicates a sense of self-identity, based on its psychological meanings and emotional appeals [19,58]. Therefore, the first hypothesis has been refined as follows:

**Hypothesis 1a (H1a).** *The symbolic dimension of a design furniture product positively influences the purchasing intention of consumers more than the aesthetic and functional dimensions do.*

### 2.3. Consumer Environmental Responsibility

The growing consciousness about the negative effects of traditional production and consumption systems on our planet has improved the debate on corporate and consumers' responsibility from all stakeholders (government, manufacturers, and consumers). The above awareness has also led to a social re-orientation, aimed at including sustainable practices into both companies' activities and consumers' practices. Companies, for their part, are becoming increasingly mindful about the adoption of sustainable practices aimed at minimizing their negative environmental and social impacts. Furthermore, legislation and society themselves are demanding that innovation in products, services, processes, and business models will be accompanied by a greater responsibility for a more sustainable development [59]. As a consequence, a number of strategies related to circular economy and eco-design approaches have been gradually adopted by companies (e.g., LCA, MECCO matrix, Design for X approach, etc.) in order to improve their overall performances [60].

From a consumer's perspective, concerns about environmental issues are constantly changing lifestyles, especially in terms of purchasing behaviors [61]. Consumer environmental responsibility (CER) has been defined as "a state in which a person expresses the intention to take direct action to remedy environmental problems—acting not as an individual consumer with his or her own economic interests, but through a citizen-consumer concept of social and environmental well-being" [62] (p. 601). Notably, Stone and Barnes [62] assumed that the CER concept is made up of five dimensions, including: (1) concern for the environment; (2) knowledge and awareness of environmental issues; (3) adoption of ecologically responsible behaviors; (4) willingness to act; and (5) having adequate skills to act on environmental issues. This implies that consumers' environmental responsibility covers all the consumption activities, which can produce some impact over the environment. As stated by Yue et al. [23], CER derives from the norm activation model, which was originally proposed by social psychology while, later, it was applied in several disciplines, including consumer behavior, education, and environmental sociology [63]. According to this model,

the sense of responsibility can be considered as an individual state of mind, which can result in the adoption of altruistic behavior based on personal norms [64]. That is, when an individual internalizes social norms into personal norms, his/her sense of responsibility will be activated. With respect to the environment, environmental responsibility is considered the fundamental psychological variable, as it encourages individuals to pay close attention to environmental issues. On these bases, Stern et al. [28] demonstrated the existence of a positive relationship between environmental responsibility and proactive environmental behavior. Other researchers also demonstrated the positive effects of CER on purchasing intention. Costa Pinto et al. [31] proved that when individuals are very attentive to their identity, there is a greater propensity for sustainable consumption, especially by women, due to substantial biological differences and social experiences. Similarly, Kaiser and Scheuthle [65] found a positive relationship between the environmental responsibility of the Swiss population and its pro-environmental actions. Other studies [66,67], specifically focused on the young market, additionally found a higher willingness to pay a premium price for sustainable products by millennials compared to other generational cohorts.

Despite the above evidence, very little attention has been devoted to the relationship between CER and consumers' behavior towards design products, especially in the furniture setting. Based on previous studies [68,69], it is likely to suppose that consumers' consciousness towards environmental issues could positively affect their purchasing intention of eco-design products. For instance, Xu et al. [70] demonstrated that individuals with a high sense of responsibility towards the environment are more likely to purchase environmentally friendly cars. Similar findings were found by Jin and Cui [71], which focused on eco-design clothes. Nevertheless, the same relationship should still be demonstrated for eco-furniture products, and its generalization to the overall furniture design context should be even more questionable. Prior literature suggested that some design attributes could be a source of concern for those individuals that are environmentally involved, as they tend to be more focused on the quality of an object and the solution it provides rather than on its aesthetic and stylistic features [72]. This concern particularly fits the furniture setting, where production processes require the use of large amounts of raw (e.g., wood, metals, etc.) and industrial (e.g., paint, plastic, solvents, etc.) materials with high environmental impact. In this context, environmentally responsible consumers could be more adverse towards design furniture products, showing a lower intention to purchase them. However, these suppositions require further observations and analyses based on empirical data.

Thus, a further hypothesis of this study has been proposed as follows:

**Hypothesis 2 (H2).** *Consumers' environmental responsibility negatively affects the purchasing intention of design furniture products.*

In addition, the consumers' awareness about environmental issues could also affect the way through which design attributes influence consumers' purchasing intentions. It has been previously supposed that the perception of design attributes directly influences consumers' purchasing intention. Nevertheless, as earlier discussed, the design concept combines different dimensions concerning functionality, aesthetics, and symbolic features. In this respect, Arboleda and Alonso [11] considered environmental features as a part of the symbolic dimension of an object, since environmental concerns strictly involve the relationship between the product and the individual himself [73]. Based on this reasoning, it is likely to suppose that the greater the consumers are involved in environmental issues, the greater purchasing intention is affected by the symbolic attributes of design. Thus, consumers' environmental responsibility positively moderates the relationship between design attributes and purchasing intention, especially between the symbolic dimension of design and purchasing intention, as proposed in the third hypothesis of this study:

**Hypothesis 3 (H3).** *Consumers' environmental responsibility positively moderates the relationship between symbolic attributes of design and purchasing intention.*

Figure 1 depicts the overall model under investigation along with the research hypotheses.

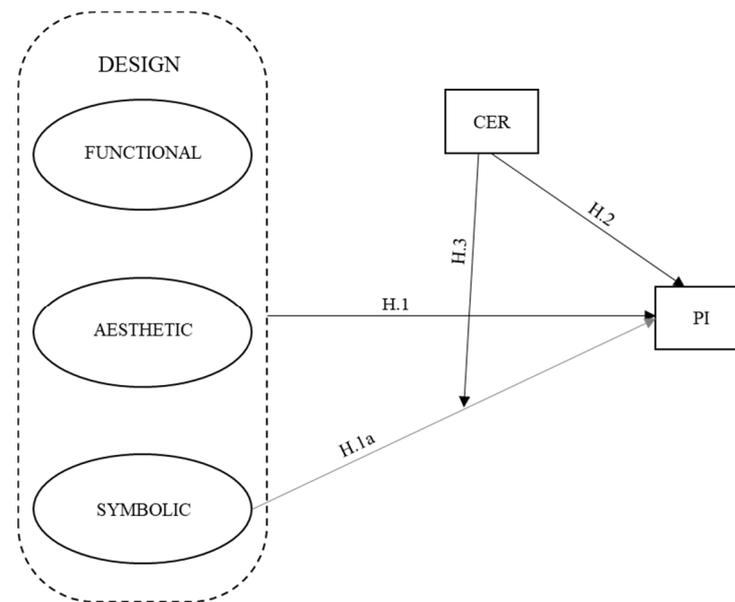


Figure 1. The research model.

### 3. Materials and Methods

#### 3.1. Instrument and Data Collection

Data for this study were collected through a self-administered questionnaire involving a sample of 350 Italian people, aged between 18 and 35 years (i.e., millennials). The questionnaire consisted of three sections exploring: (i) the socio-demographic characteristics of the respondents (i.e., age, education, occupation, marital and housing status), (ii) the perception of design by consumers and its impact on their decision-making process when choosing a design furniture product, and (iii) the degree of individual environmental responsibility.

Respondents were selected among the millennial generation for multiple reasons. First, they seem to be particularly inclined towards design products, and design attributes have been recognized as important antecedents of their satisfaction [56], perception [57], and preferences [55]. Second, millennials have been considered among the most receptive groups towards environmental issues, and are willing to pay a premium price for sustainable products [66,67]. Finally, this generation represents one of the most influential markets for many businesses [74]. Despite this evidence, millennials' behavior has not been fully understood, especially with regard to the furniture sector, thus suggesting the interest for further investigations.

The questionnaire was distributed from June 2019 until March 2020 by using the CAWI methodology, which has been proved to be preferable by young people [75]. Moreover, it usually gives the researcher access to a large population that could be difficult to reach through other channels [76,77] and provides more honest reporting of embarrassing attributes or behaviors [78,79]. Despite some limitations mainly related to fraudulent responses and technical difficulties (e.g., accessibility of the Internet, junk mail, etc.), this procedure enabled the collection of 357 filled questionnaires, which led to the final sample of 350 after removing seven questionnaires for data incompleteness. The sample reflects a general population panel, as proposed by the American Association for Public Opinion Research (AAPOR), including hundreds of people that are involved in general research with low incidence characteristics of the respondents. The sampling procedure did not provide information about the total number of contacted subjects; it just provided the number of those who voluntarily decided to join the survey ([www.aapor.org](http://www.aapor.org), accessed on 24 March 2021).

Table 1 summarizes the socio-demographic characteristics of the sample.

**Table 1.** Sample profile ( $N = 350$ ).

Variables	Sample Amounts	Percentage (%)
<b>Gender</b>		
Male	163	46.57%
Female	187	53.43%
<b>Area of Residence (ISTAT)</b>		
Northern Italy	113	32.29%
Central Italy	57	16.29%
Southern Italy	181	51.71%
<b>Education</b>		
Junior middle school	13	3.71%
Senior high school	102	29.14%
Bachelor's degree	144	41.14%
Master's degree/PhD	91	26.0%
<b>Occupation</b>		
Student	181	51.71%
Worker	107	30.57%
Freelance	32	9.14%
Unemployed	31	8.86%

### 3.2. Measures

In this study, purchasing intention (PI) was the dependent variable of the research framework, while design (DES) and consumer environmental responsibility (CER) were assumed as independent variables. Moreover, CER was considered as a moderator on the relationship between DES and PI.

Each construct was measured through single or multi-items scales adapted from existing literature in order to fit the aim and context of the present survey, while improving their overall validity.

As for PI, in line with previous studies of Kamins and Gupta [80] and Pradhan et al. [81], it was measured through a single-item scale, by asking “How many times do you intend to purchase a design furniture product in the future?”. The level of frequency was assessed through a 7-point Likert scale ranging as follows: 1 = never, 2 = rarely (in less than 10% of chances that I could have), 3 = occasionally (in about 30% of chances that I could have), 4 = sometimes (in about 50% of chances that I could have), 5 = frequently (in about 70% of chances that I could have), 6 = usually (in about 90% of chances that I could have), 7 = every time.

The main independent variable (i.e., DES) was assessed with thirteen items derived from the original scale of Arboleda and Alonso [11], with two minor adaptations: (i) the item “it meets a specific purpose” was divided into two items by considering the distinction between functional and symbolic values of design. This distinction is consistent with previous literature based on both the designer’s perspective [73] and the consumer’s one [82]; (ii) the original item “anyone can use it” was deleted given its similarity with the item “I understand how to use it”.

Finally, according to Yue et al. [23], CER was measured with a four-item scale, including: (i) my actions impact the health of the environment; (ii) I have the power to protect the environment; (iii) I can learn how to improve the environment; (iv) I will work to make my surrounding environment a better place. The measurement of DES and CER items was based on a 7-point Likert scale ranging from strongly disagree (=1) to strongly agree (=7).

Demographic variables (i.e., gender, occupation, area of residence and education) have been set as control variable in the proposed model.

Appendix A summarizes all variables used in this study, along with their indicators and the main references.

### 3.3. Data Processing

The first research question (RQ1) of this study was addressed through an exploratory factor analysis (EFA) aimed at investigating the structure and key dimensions of the design concept. Then, a structural equation modeling (SEM) was performed to confirm the factorial structure of design and to assess the relationships among variables, as well as the moderating role of CER on the relationship between DES and PI (RQ2).

Before running the factor analysis, the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were evaluated. As shown in Table 2, both tests produced significant values, suggesting the adequacy of EFA for the design construct [83]. Factors were extracted and interpreted by using the principal component method (PCA) along with the varimax rotation method and Kaiser normalization [84].

**Table 2.** Rotated component matrix. Results from the EFA.

	Items	Factors		
		DES-Functional	DES-Aesthetic	DES-Symbolic
D3	I understand how to use it	0.848	-	-
D6	It does not break easily	0.783	-	-
D1	It meets a specific functional purpose	0.751	-	-
D9	It is comfortable	0.678	-	-
D5	It is my style	-	0.781	-
D4	It is pretty	-	0.717	-
D2	It meets a specific hedonistic purpose	-	0.622	-
D8	It is a creative object	-	0.619	-
D12	It provides me to social status with respect to others	-	-	0.802
D11	It is perceived as something different from what was expected	-	-	0.760
	% of variance explained	24.17	21.29	16.19
Kaiser-Meyer-Olkin Measure of Sampling Adequacy				0.720
Bartlett's Test of Sphericity				Approx. Chi-Square
				Df
				Sig.
				923.375
				45
				0.000

The SEM analysis, based on partial least squares (PLS-SEM) approach, was divided into two steps: (i) the evaluation of the measurement model, aimed at assessing the overall validity of the model based on its reliability, convergent and discriminant validity, and (ii) the estimation of the structural model to analyze the multiple relationships between the dependent, moderating, and independent variables.

All data have been analyzed using the statistical software SPSS (version 23) and WarpPls (version 7.0).

## 4. Results

### 4.1. The Perception of Design Attributes: Results from Exploratory Factor Analysis

An exploratory factor analysis (EFA), based on the principal component analysis (PCA) method, was employed in this study to investigate the consumers' perception of design. In particular, this procedure enabled the researchers to group and order the list of attributes defining the design concept according to their importance.

After rotation of the factor matrix, only items with factor loadings above 0.5 were retained for the analysis [83]. Therefore, three original items were deleted, these being D7, D10, and D13. By applying the Kaiser's criterion of eigenvalues greater than one [85] and the Cattell's scree test [86], items were grouped into three factors, accounting for 61.64% of the total variance. Based on their salient loadings [83] and similarities with the original

study of Homburg et al. [10], factors were labeled as DES-Functional, DES-Aesthetic, and DES-Symbolic.

DES-Functional explains the 24.17% of the total variance. It is related to the durability of the product and its ability to satisfy functional needs in a way that is comfortable and easy for the consumer. This is in line with the findings of Bürdek and López-Manzanares [73] by showing that the functional dimension of design refers to an object itself, concerning what it is made for, how it works, and what its basic function is. The second factor (i.e., DES-Aesthetic) explains 21.29% of the total variance and refers to the aesthetic features of the product in terms of style, creativity, and pleasantness. In other words, DES-Aesthetic is strictly related to the ability of the product to satisfy consumers' hedonic needs. Finally, DES-Symbolic explains the 16.19% of the total variance and concerns those product features which can represent a user's identity [82]. As Bürdek and López-Manzanares [73] highlighted, the symbolic function of design refers to the relationship between an object and the individual, and, thus, it may be associated with its ability to represent a particular social status for the user and to communicate the concept of uniqueness.

Overall, the EFA provided evidence that the consumer perception of design is mostly influenced by the functional and aesthetic attributes of an object, as they are the most important in terms of weight and variance explained. Results confirmation was gained by using the SEM analysis.

#### 4.2. SEM Analysis

The SEM procedure enabled the researchers to confirm the factorial structure of design, as well as to deepen the relationship between design and purchasing intention, by addressing all the research hypotheses. Consumers' environmental concern was considered as a moderating variable, according to a moderator construct approach, by using the product of the exogenous variable DES-Symbolic and CER (i.e., DES-Symbolic \* CER) [87].

The results of the measurement model are shown in Table 3. Multiple runs of SEM estimations were performed until all items' loadings were greater than 0.70 [83]. The final estimation confirms the results that previously emerged from the EFA, providing reliability values of the measurement model and the robustness of the constructs. Notably, Cronbach's alpha values were near to or exceeding the threshold of 0.60, thus assessing the reliability of the constructs [88], while composite reliability (CR), which assures the blocks' homogeneity, was always above 0.7. The loading computation displayed values above 0.70 (with *t*-values above 1.96 and *p*-value < 0.05), denoting that each construct explains over 50% of the indicator's variance [88].

The overall validity of the model was investigated by focusing on its convergent and discriminant validity [89]. The results of the average variance extracted (AVE) for each variable can be accepted, as they exceed the threshold of 0.50 [89], thus establishing the convergent validity of the model. Discriminant validity was also supported since the AVE of each construct was greater than the square of its inter-constructs' correlation (Tables 3 and 4).

Table 3. Assessment of the measurement model.

Variable	Items			Cronbach's Alpha	Composite Reliability (Dillon Goldstein Rho)	Average Variance Extracted (AVE)
	Weight	Loading	<i>t</i> -Value			
<i>DES-Functional</i>				0.781	0.860	0.605
D3	0.345	0.837	17.701			
D6	0.319	0.772	16.174			
D1	0.323	0.783	16.437			
D9	0.296	0.716	14.878			
<i>DES-Aesthetic</i>				0.704	0.819	0.531
D5	0.367	0.780	16.365			
D4	0.315	0.668	13.798			
D2	0.348	0.738	15.399			
D8	0.341	0.724	15.058			

Table 3. Cont.

Variable	Items			Cronbach's Alpha	Composite Reliability (Dillon Goldstein Rho)	Average Variance Extracted (AVE)
	Weight	Loading	t-Value			
<i>DES-Symbolic</i>				0.545	0.815	0.687
D12	0.603	0.829	17.515			
D11	0.603	0.829	17.515			
<i>CER</i>				0.775	0.856	0.775
CER1	0.322	0.772	16.177			
CER2	0.352	0.843	17.845			
CER3	0.303	0.726	15.110			
CER4	0.313	0.750	15.669			
<i>PI</i>	1.000	1.000		1.000	1.000	1.000

Table 4. Construct correlation and discriminant validity.

	DES-Functional	DES_Aesthetic	DES-Symbolic	CER	PI
<b>DES_Functional</b>	<b>0.778</b>				
<b>DES-Aesthetic</b>	0.302	<b>0.729</b>			
<b>DES_Symbolic</b>	0.130	0.397	<b>0.829</b>		
<b>CER</b>	0.274	0.431	0.193	<b>0.880</b>	
<b>PI</b>	0.111	0.216	0.335	0.156	<b>1.000</b>

Note: Bold values indicate the square root of AVE.

The overall model fit was assessed by using the main quality indices suggested for PLS-SEM analysis. Version 7.0 of WarpPLS produces several model fits, as shown in Table 5. Most of them revealed their conformity with the requirements, especially ARS ( $p < 0.005$ ) AVIF ( $< 3.3$ ), GoF ( $> 0.36$ ), SPR ( $> 0.7$ ), and SSR ( $> 0.7$ ) [83], thus suggesting a general good fit of the conceptual model and its appropriateness for further structural testing.

Table 5. Model fit and quality indices.

Model Fit	Requirements	Results
Average path coefficient (APC)	$p < 0.005$	0.076 ( $p = 0.037$ )
Average R-squared (ARS)	$p < 0.005$	0.134 ( $p = 0.003$ )
Average adjusted R-squared (AARS)	$p < 0.005$	0.114 ( $p = 0.008$ )
Average block VIF (AVIF)	$< 3.3$	1.424
Average full collinearity VIF (AFVIF)	$< 3.3$	1.407
Tenenhaus GoF (GoF)	$> 0.36$	0.332
Sympson's paradox ratio (SPR)	$> 0.7$	0.750
R-squared contribution ratio (RSCR)	$> 0.9$	0.998
Statistical suppression ratio (SSR)	$> 0.7$	0.875
Nonlinear bivariate causality direction ratio (NLBCDR)	$> 0.7$	0.813

The inner model estimation was helpful for addressing the relationships between variables with related hypotheses. Path coefficients were considered significant with t-values greater than 1.96 and a p-values not exceeding 0.05 (\*\* highly significant) or 0.10 (\*\* very significant) [90,91].

Results highlighted that only the symbolic dimension of design has a positive influence on purchasing intention of design furniture objects ( $\beta = 0.291$ ,  $p < 0.05$ ). This supports hypothesis H1a, while hypothesis H1 is not fully confirmed because both the relationships between DES-Functional and PI and DES-Aesthetic and PI are not statistically significant.

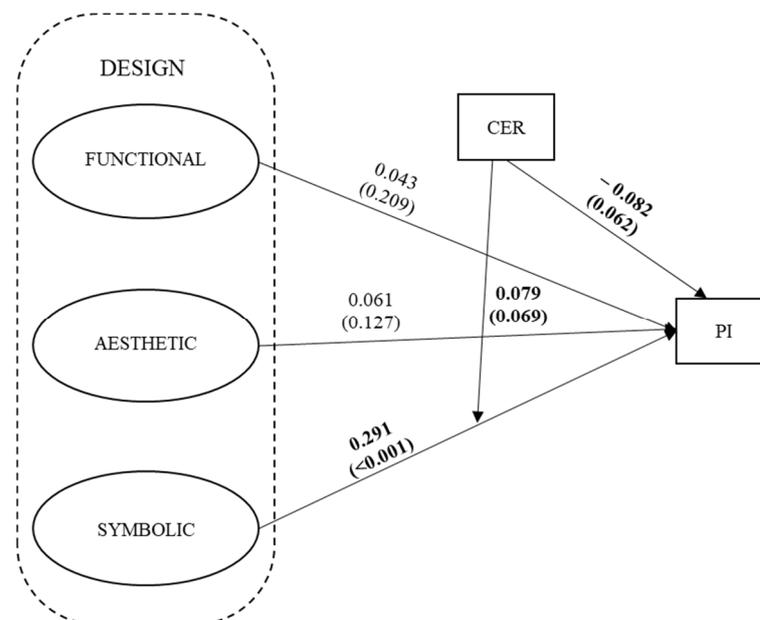
The attention of consumers towards environmental issues (CER) negatively affects PI ( $\beta = -0.082$ ,  $p < 0.10$ ). Hence, hypothesis H.2 is supported by the data. Moreover, CER acts as a moderator on the relationship between the symbolic dimension of design and purchasing intention ( $\beta = 0.079$ ,  $p < 0.10$ ), suggesting that the greater the attention towards environmental problems is, the greater purchasing intention is affected by the symbolic

attributes of design, concerning its ability to communicate the user's identity and social status. These findings support hypothesis H3, while being in line with the conceptual definition of design proposed by Arboleda and Alonso [11] and other scholars [92,93], who considered the environmental impact of the product as a variable that strictly concerns the symbolic dimension of design, referring to the relationship between products and individuals in this context. The coefficients of the control variables have not been shown in Table 6 (as well as in Figure 2) since they are not statistically significant in affecting consumers' purchasing intention ( $p > 0.05$ ).

**Table 6.** Structural model estimation.

Path	Beta	t-Value	p-Value	Results
H1: DES > PI				
H1a: DES-Symbolic > PI				H1: Partially supported
DES-Functional > PI	0.043	0.811	0.209	
DES_Aesthetic > PI	0.061	1.144	0.127	H1a: Supported
DES-Symbolic > PI	0.291 ***	5.682	<0.001	
H2: CER > PI	−0.082 **	−1.546	0.062	H2: Supported
H3: DES-Symbolic * CER > PI	0.079 **	1.988	0.069	H3: Supported

*p*-values not exceeding 0.05 (\*\*\*) highly significant); *p*-values not exceeding or 0.10 (\*\*) very significant).



**Figure 2.** Results of structural equation modeling analysis.

## 5. Discussion and Implications

The results confirm the appropriateness of the three-dimensional conceptualization of design within the furniture industry, highlighting the critical role of symbolic attributes in affecting the consumer intention to buy furniture items. Moreover, by considering the increasing attention of millennials towards environmental issues, this study provides new insights about the positive effect of CER on the relationship between consumers' design perception and their actual purchasing behaviors.

Practical implications can be drawn from these findings along two main directions.

Firstly, furniture companies should consider all the dimensions of design (functional, aesthetic, and symbolic) while defining their strategies, albeit with some distinctions related to different moments in the customer journey. As suggested by the EFA's results, consumer perception is mostly affected by the functional and aesthetic attributes of a product. However, the SEM procedure revealed that purchasing intention is more influenced by

the symbolic ones. Therefore, furniture companies should primarily focus on functional and aesthetic dimensions of design to communicate the design content of a product and to affect the perceptive level of the consumer, while they should enhance the symbolic features during the purchasing stage, in order to improve the actual consumers' willingness to buy a specific product (by acting on their behavioral level). Different product and communication strategies could be reasonably implemented to accomplish this end. As far as the product strategy, high attention must be paid to all design attributes of a furniture product, which should be designed after a careful analysis of the market demand aimed at understanding: (i) what are the real needs and expectations of consumers and the driving values inspiring their purchases, (ii) what are their main criteria of evaluation and use, and (iii) what are the most effective attributes in producing different responses by consumers. As concerning the communication strategy, messages should be more emotional, by leveraging the uniqueness of the product and its ability to identify and incorporate those values that consumers appreciate. In this regard, innovative tools and policies could be employed by companies. For instance, they could work on a more strategic design of the store atmosphere within their point of sales. Furthermore, they could also adopt a more direct communication, by organizing events to which consumers are invited to see and try the design product. Social media tools could also play an important role to this end, as they enable companies to develop a more direct and trustful relationship with consumers. For example, furniture brands could make and share videos in their retail shops to illustrate the sustainable design characteristics of their products and to demonstrate that they are not harmful, contrary to non-green furniture products whose harmful gas (e.g., formaldehyde) can threaten consumers' health [18]. These strategies could be particularly effective if addressed to those consumers who have a high health consciousness, since their concerns and motivations can be used by furniture brands, and not only to increase their sales prices but also, consequently, to increase their market shares [94,95]. Overall, these considerations suggest the need for effective internal training and communication programs within companies, especially aimed at those departments operating in the technical, R&D, and marketing fields, whose activities are primarily aimed at product development. More specifically, the marketing department could play a strategic role in facilitating functional coordination, knowledge sharing, and ensuring that all the activities of the design management team are aimed at anticipating and satisfying consumers' needs and desires. This is also in line with Noble and Kumar [2], who claimed that the design team should manipulate product attributes with the aim of meeting design goals, which, in turn, can range from shaping consumers' perceptions to triggering new needs and expectations.

A second suggestion concerns millennials' involvement with environmental issues and its impact on design perception and purchasing intention. Results revealed that environmental concern—which has been included in the symbolic dimension of design based on Arboleda and Alonso's [11] conceptualization—negatively affects millennials' purchasing intention. Furthermore, the higher the attention of consumers towards environmental issues, the greater is the effect of symbolic attributes on purchasing intention, thus suggesting the existence of a moderating effect of environmental concern. Based on these findings, companies should consider the role of environmental concern in millennials' minds while defining their design strategies. By focusing on the symbolic attributes of design with the aim of addressing environmentally concerned consumers, companies can gain some interesting benefits, since the symbolic attributes have a positive and direct effect on purchasing intention. Thus, furniture companies should intercept the needs and expectations of those consumer targets that are more sensitive to environmental protection. To this end, a careful analysis and segmentation of the markets could be particularly helpful for effective products and brand-positioning strategies. A further consideration can be drawn in terms of the environmental practices that companies could adopt. Furniture companies could improve their efforts with the aim of reducing the use of raw materials and energy in their processes by recycling wastes and extending the end-of-life cycle of products, thus improving overall consumer welfare [96]. By adopting the basic principles of circular economy, these activities

could facilitate the adoption of eco-design strategies, with several advantages in terms of economic, financial, and social benefits. Indeed, by combining design and environmental aspects, eco-design is more likely to attract consumers who are highly environmentally involved—as in the case of the millennial generation—and to stimulate a behavioral response in terms of purchasing intention [68,69]. Additionally, eco-design practices could increase social wellbeing, since they contribute to job creation, increased consumer trust in sustainable products and services, as well as the development of solutions that are able to retain their value in society since they are designed to last longer and be repaired easily [97]. Companies could also increase the adoption of both product and process certifications. To this end, a specific question in this study was formulated to evaluate the consumers' purchasing intention of certified design furniture products. Data revealed that respondents expressed a growing willingness to: (i) buy certified design-based products rather than similar, non-certified ones (mean value = 5.08; standard deviation = 1.443; variance = 2.082); (ii) recommend to others to buy certified design-based products (mean value = 5.35; standard deviation = 1.485; variance = 2.207); (iii) buy certified design-based products in the future (mean value = 5.43; standard deviation = 1.460; variance = 2.131). Here, the critical role of the furniture companies' marketing and communication strategies emerges, along with the different tools that can be used in their retail shops, brochures, websites, and other media.

## 6. Conclusions, Limitations, and Future Research

This study contributes to the literature on design management by adding new insights into the specific context of the furniture industry, where design plays a critical role for companies' competitiveness and survival [98].

Firstly, the present findings enable the identification of the different dimensions of design that affect consumers' perception in the furniture sector. In particular, the results confirmed that design can be intended as a three-dimensional construct, based on functional, aesthetic, and symbolic attributes, thus supporting previous literature [10] and enriching the scarce debate on the use of this kind of conceptualization in specific sectors [10]. Notably, the present study suggests that consumers' perception of design furniture products is mostly influenced by the functional and aesthetic attributes of a furniture product (RQ1).

A second contribution concerns the relationship between design and purchasing intention, through an explicit analysis of its different dimensions. The results demonstrated that design attributes influence consumers' purchasing intention, especially in terms of symbolism, which refers to the iconic and communicative meanings of the product. This is consistent with prior literature [10,19,58], which stressed the importance of the symbolic dimension for purchasing intention, especially in the furniture setting, where consumers are keener to buy products that enable them to better express their self-identities and emotional meanings.

Lastly, the results of this study deepen the relationship between design and purchasing intention, by introducing the consumers' environmental responsibility, on which very few studies concerning the furniture setting have been found until now. It emerged that environmental concern negatively affects the purchasing intention of design furniture products, thus supporting the prior study of Beverland [72]. Moreover, individual environmental concern moderates the relationship between the symbolic dimension of design and purchasing intention (RQ2). That is, when consumers are highly concerned about environmental issues, they tend to be more influenced by the symbolic dimension of design.

Certainly, this study presents some limitations and several challenges regarding both theory building and methodology that are hoped to be successfully overcome by future research. A first limitation can be identified in the nature of the data. These were collected through self-administered questionnaires, which allowed limited possibilities to have a more subjective expression of the respondents' opinions. Therefore, the use of other

qualitative methodologies, such as semi-structured interviews, focus group, and participant observation, would enable researchers to overcome this limit.

A second limitation lies in the composition of the sample. As previously discussed in Section 3, the study was conducted on a random sample of millennial respondents. This should not be considered as a limitation in a technical sense. Furniture companies, indeed, could benefit from a better understanding of the millennial group, as environmentally friendly policies could attract new consumers and encourage people to work for them. However, a comparison between different generations and/or cultures would provide further interesting results. In a more general sense, future research could be extended to different samples, both in terms of size and composition, in order to increase statistical representativeness and to enable a wider generalization of the results.

Furthermore, given the pervasiveness of the design concept—ranging from product design to environmental aspects—new conceptualizations of the design concept, along with its effects on consumers' buying decision processes—could be further investigated. Future research, for instance, might explore different predictive models which involve the analysis of other moderating and/or mediating variables, such as store atmosphere, the design of a company's website, and the consumers' attitude towards the online purchase of design furniture products.

Finally, the comparison of different perspectives (e.g., consumers' and retailers' perspectives) and of other similar and/or related industries could provide additional theoretical findings as well as useful practical suggestions.

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## Appendix A

**Table A1.** Constructs' definition and measures.

Construct	Code	Items	References
Purchasing intention (PI)	PI1	How many times do you intend to purchase a design furniture product in the future?	Kamins and Gupta (1994) Pradhan et al. (2014)
	D1	It meets a specific functional purpose	
	D2	It meets a specific hedonistic purpose	
	D3	I understand how to use it	
	D4	It is pretty	
Design attributes (DES)	D5	It is my style	Arboleda and Alonso (2014)
	D6	It does not break easily	
	D7	It has a positive impact on the environment	
	D8	It is a creative object	
	D9	It is comfortable	
	D10	I hope to use the same object in the future	

**Table A2.** Constructs' definition and measures.

Construct	Code	Items	References
Consumer environmental responsibility (CER)	D11	It is perceived as something different from what was expected	Yue et al. (2020)
	D12	It provides me to social status with respect to others	
	D13	It offers me something different than other products in the same category	
	CER1	My actions impact the health of the environment	
	CER2	I have the power to protect the environment	
	CER3	I can learn how to improve the environment	
	CER4	I will work to make my surrounding environment a better place	

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