

# CONSUMPTION TRENDS IN CHINA AND GERMANY IN COMPARISON: AN EMPIRICAL CROSS-CULTURAL STUDY ON THE ROLE OF SUSTAINABILITY AND CUSTOMIZABILITY

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**Abstract:** *In recent years, sustainability and customization trends have gained increasing attention. However, the influence of these two trends on consumers' buying behavior has only been studied independently from each other. Moreover, it is unclear how both trends influence buying behavior of consumers with different cultural backgrounds living in countries with discrepant development levels. We conducted a choice-based conjoint analysis with two similar groups of university students in China and Germany. With the results of this study, we find that in both, China and Germany, customization, environmental and social sustainability do have a significant positive impact on the consumer purchase decision.*

**Key Words:** *Customization, Sustainability, Conjoint Analysis, Cross Cultural Study*

## 1. INTRODUCTION

In recent years, companies around the globe have faced changing consumption behaviors. Especially two trends have emerged which fundamentally influence the way consumers buy goods. The first trend is the increasing demand for individual and personalized goods and services [1]. The second trend is related to an increasing awareness and demand for socially and ecologically sustainable goods and services [2]. These two trends have spread across the world at different speeds. Previous research shows that people from different cultural backgrounds hold diverging attitudes on sustainability or customization of goods [3-5] Also the economic development level of a nation plays an important role for people's consumption behavior [6] [7]. Thus, the influence of sustainability and customizability on a consumer's purchase decision may vary considerably, depending on country or cultural background. Previous studies have only investigated the role of sustainable and customizable aspects in consumer choice independently from each other [8-10].

With our study, we aim at contributing to the understanding of how sustainability and customization influence the purchase decision in China and Germany, representing the Asian and European market. Based on cultural dimension and development theory, we derive assumptions about the impact of the two trends in the two countries. Using the example of a smartphone purchase as a baseline scenario, we use a choice-based conjoint analysis (CBCA) with an online survey including randomized choice scenarios for a smartphone purchase. This method allows us to estimate the relative utility of customizability, sustainability and price of a product for both countries represented by 250 responses each. We used the example of smartphones as they play an important role in people's everyday life. The main contribution of this study is to improve the understanding of how sustainability concerns and possibilities for individualization influence consumers' purchase decisions in the two different regions of analysis. These insights can be used to show how companies can create additional value for consumers in different countries through the integration of possibilities for individualization and improved sustainable production.

This paper is organized as follows: Firstly, we outline the theoretical background of this study. Then, we describe the development of our research hypotheses. This is followed by a description of our research method. In chapter four, we present the results of our analysis and discuss the alignment of our results with our hypotheses in the following chapter. We finalize our study by outlining our key findings, the limitations of our study and opportunities for further research.

## 2. THEORETICAL BACKGROUND

In this chapter, we introduce the theoretical concepts that are used to develop our study, to derive hypotheses and to answer our overall research questions. Firstly, we present the paradigm of sustainability, followed by an introduction of the concept of Mass Customization

(MC), which companies apply when offering individualized goods and services to individual consumers in a mass market. Then, we will introduce the cultural dimension theory based on Hofstede et al. (1991), the Human Development Index (HDI) and Sustainable Society Index (SSI) as sources for explaining different consumer behavior between Germany and China.

### **2.1. Sustainability**

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [11]. The term ‘sustainability’ was later explicitly explained as having three dimensions: economic, environmental and social [12]. In this paper, we adopt a definition from Morelli [13] who defines environmental sustainability (ES) “as meeting the resource and service needs of current and future generations without compromising the health of the ecosystems that provide them.” Improving the ES implies controlling and optimizing the production process along the whole product life cycle. The term product life cycle describes the four stages in the manufacturing process: pre-manufacturing, manufacturing, use and post-use [14]. These four stages of the product life cycle are used in the survey design to gather comprehensive consumer opinions. Regarding social sustainability (SS), we adopt the widely used definition of SS as the paradigm of improving the social wellbeing not only for this generation but also for the next generations [11]. SS includes a wide variety of aspects, from basic requirements (potable water, health, food, medication and so on) to less tangible needs concerning education, employment, equality and justice [15]. The OECD summarized a large range of social indicators that provide objective measures of the conditions of SS. With regard to the electronic industry, we introduce the three most relevant indicators for our study: wages and working conditions, child labor, and conflict minerals which are mostly used in electronic devices such as laptops and smartphones [16].

### **2.2. Mass Customization**

MC has become the most important label for discussing companies’ strategies to address individual consumer needs through the customization of goods and services. Davis was the first to define MC in 1987. According to him, MC is on hand when “the same large number of consumers can be reached as in mass markets of the industrial economy, and simultaneously treated individually as in the customized markets of pre-industrial economies” [17]. Pine (1993) puts even more emphasis on the customization process and highlights the importance of pricing in his definition. He defines it as “providing tremendous variety, and individual customization, at prices comparable to standard goods and services” [18]. Moreover, he adds that MC should provide “enough variety and customization that nearly everyone finds exactly what they want” [18]. Piller (2004) found out that MC can begin on three dimensions: fit, style and functionality. Looking at these dimensions from a smartphone perspective, the dimensions could be

as follows: Fit could describe the screen or overall size of the device. Style could relate to the outward appearance, e.g. customized covers. Finally, functionality could mean to add or to remove features, e.g. a heart rate sensor. In this paper, those three aspects will be used to design different customization levels of the product in the empirical survey. In this study, we refer to customizability when using the term MC.

### **2.3. Hofstede’s cultural theory**

Our analysis of sustainability and customizability is embedded in cross-culture study. This cultural dimensions’ theory is one of the most widely used national cultural frameworks [19]. Hofstede defines five dimensions of culture: Individualism–collectivism, uncertainty avoidance, power distance, masculinity–femininity and long-term orientation [20]. Individualism–collectivism refers to “the degree to which individuals are integrated into groups” [20]. The people in an individualist culture have an ‘I’ consciousness. Privacy is considered important. They think it is good to express opinions and tasks that are more important than relationships. In a collectivist culture, a sense of belonging and harmony plays an important role. People think of themselves in groups rather than as individuals. Relationships are of great significance. Uncertainty avoidance is related to society’s tolerance of the uncertainty of the future. The people in higher uncertainty avoidance cultures prefer to plan carefully and to reduce risks. Rules, laws and regulations are necessary to realize the planning. Power distance reflects the influences of power distribution and hierarchy. In a culture with large power distance, inequalities in society are acceptable. Masculinity–femininity: a society is called masculine if men are supposed to be assertive, ambitious and tough. Challenge and recognition are important in such societies. In a feminine society, people pay more attention to relationships and quality of life. Long-term vs. short-term orientation is related to the time dimension of peoples’ efforts; is it for the past, the present or the future?

### **2.4. Human Development Index and Sustainable Society Index**

The HDI is an overall measurement of social development. It shows not only the development of an economy but also the level of social wellbeing, which gives us a comprehensive understanding of a country. HDI stresses three essential factors of all levels of development: Life expectancy at birth, adult literacy and income per capita. The first indicator, life expectancy at birth, measures a long and healthy life [21]. The concepts of health, ES and SS are highly related to each other. In this paper, we will consider the issues of polluted living conditions, hazardous materials, poor working conditions and child labor, which have negative influences on a long and healthy life (IPEC, 2011). The second indicator, adult literacy or education, is the basis of economic and social development. The last indicator, income per capita, is the most widely used measure of economic development and represents the average income earned per person in a certain area. On one side, there are

developed countries, in which people have a better living standard. The basic survival needs such as food, housing, education and healthcare are solved in those countries. Under such conditions, people have higher pursuits, for instance, harmony with nature and equality in the society. On the other side, there are developing countries in which people have lower incomes and still struggle to survive [22]. HDI is a suitable measurement to receive a rough overview of the level of development, especially for the comparison between developing and developed countries.

The SSI includes the main aspects of sustainability and living standards of a country with simple and clear indicators [23]. All 21 indicators are divided into seven categories in three wellbeing dimensions: human wellbeing, environmental wellbeing and economic wellbeing [24]. The SSI data from the years 2006, 2008, 2010 and 2014 reflect several critical facts that are relevant for this paper. Firstly, the countries with a higher score in wellbeing also have a relatively better performance in other indicators. In contrast, the countries with lower achievement show an unbalanced distribution. For example, Sri Lanka has good performance in the aspect of Air Quality, Green-house Gases, Biodiversity and Renewable Water Resources. Nevertheless, it shows a weakness on Renewable Energy [24].

### **3. HYPOTHESES DEVELOPMENT**

#### **3.1. Application to the Chinese context**

In the Human Development Report 2015, the HDI of China keeps improving. Until 2014, the HDI of China was located in the area of high human development [25]. One reason for the improving human development is rooted in the increasing economic growth of China. Under such conditions, consumer behavior generally changes [26]. Maslow suggests that, if a person's basic material needs are satisfied, non-material or spiritual needs are pursued [27]. Transferred to the context of consumption, people often seek to purchase goods which brings more spiritual satisfaction when material satisfaction is secured [28]. We can derive that in China consumers are no longer satisfied with only standard goods, but seek to purchase goods that meet their increasingly diverse needs. This increasing demand for individualized solutions might be enforced by a finding derived from Hofstede's cultural theory: China belongs to the countries with the lowest uncertainty avoidance [29]. Consumers that have a low level uncertainty avoidance tend to accept new products or new characters of products more easily [30]. However, it has to be stressed that although we assume that Chinese consumers have an increasing demand for customized products, collective culture still has a negative effect on customized products [31].

In contrast, it is supposed that in China consumers strongly demand for more environmentally sustainable products. Until now, China shows a very unequal development between environmental wellbeing and economic wellbeing [32]. This exposes a shortage of environmental development in China. The country

currently faces several environmental challenges which have been threatening people's health seriously. For example, haze problems or sand dust are widespread in the north of China [33]. Such environmental problems lead to an awaking environmental consciousness of Chinese people [34]. Given for instance the problem of air pollution in the country, consumers now pay more attention to the ES of products, which in turn supports a sustainable development [35]. The Chinese government has introduced policies and regulations to encourage sustainable development acknowledging but also supporting the awoken awareness.

From the perspective of SS, Parboteeah points out that consumers in collectivist cultures are not only concerned with themselves but also pursue a degree of harmony for the whole society [36]. For example, it was found that in collectivist cultures, being socially responsible has a higher incentive effect on consumer commitment than in individualist countries [37]. Therefore, the development of consumers' consciousness about SS has a certain cultural basis. Nonetheless, looking at China's SSI in 2014, we observe that China has quite a low score on income distribution and good governance [32]. Hence, social wellbeing is not highly anchored. A reason for that might be the ongoing development in the country as well as its large population. Thus, we assume that the consumer in China would favor the social aspect to a smaller degree.

#### **3.2. Application to the German context**

According to Hofstede's cultural theory, Germany is an individualist culture. Moon et al. (2008) show that consumers' intentions to buy customized products in individualist cultures are stronger than in less individualist cultures. Secondly, according to UNDP (2015), Germany belongs to the very high human development category. Besides this, the indicator of income per capita ranked Germany top in the world [21]. Based on Piller [38], who states that customized products are more attractive for people with a higher income, we suppose that in Germany, MC influences purchase decisions positively. However, Germany ranks high on uncertainty avoidance. It has been demonstrated that, people in such cultures often prefer more standard products to customized ones [39].

According to Hofstede, Germans not only tend to have a high uncertainty avoidance but also a long-term orientation culture. It is observed that higher uncertainty avoidance culture presents a higher level of ES [4]. A long-term orientation culture often coincides with the requirement of sustainability [4]. We can adapt the same assumption to SS. Firstly, in individualist cultures, people pursue personal achievements and individual rights [40]. Rules and laws often play important roles in such cultures. Thus, regulations and laws on sustainability protruding individual rights, health and social wellbeing should be relatively easy to implement in Germany's culture. From the statistic of SSI for the year 2015, Germany has a very good performance in the area of ES and SS [32]. Under such conditions, it is assumed that consumers may have a relatively higher awareness of sustainable consumption. Comparing the attitudes towards sustainability and customizability, we

can assume that sustainability is considered more important than customizability in Germany.

After having explained how cultural theory can be used to estimate the role of sustainability and customizability in consumer's buying behavior in both China and Germany, we derive the following three hypotheses:

*H1: ES, SS and MC have a positive impact on the consumer's purchase decision in both countries. Although there are significant differences in cultures and development levels, the tendencies of impact of ES, SS and MC are similar between Germany and China.*

*H2: ES has a higher impact than SS and MC on the purchase decision in China.*

*H3: Sustainability (ES and SS) has a higher impact than MC on the purchase decision in both Germany and China.*

#### 4. RESEARCH METHODOLOGY

In this paper, we use a CBCA which is a widely applied methodology for measuring and analyzing consumer preferences as a research method [41]. In a CBCA, consumers repeatedly choose their most preferred product from a set of alternatives. The process of making choices is an integral part of people's everyday lives, which can simplify the process of the survey. Furthermore, CBCA can deal with the complexity of choosing among two or more competitive profiles, each of which can vary idiosyncratically across attributes and levels [42].

In this study, the smartphone is chosen as the object of the empirical study for several reasons. Firstly, the smartphone has developed in the last 8 years at an amazing speed and has changed the way people live. The ownership rate of smartphones in Germany in 2014 is 60% and in China is 58%. Secondly, many companies have tried to develop customized smartphones and sustainable smartphones (Fairphone, Shiftphone, Google Project Ara, Puzzlephone, etc.). Thirdly, rapid development also means an imbalance in the development of technology and other aspects, for example, using conflict material, environmental pollution, child labor, etc.

Table 1. Definition of attributes and levels for the choice set

Attribute	Level
MC	1. Cover color: grey, camera: 13 megapixel, processor: 4 x 1.7 GHz & 4 x 1 GHz and software: standard package (basic virus scanner and basic pedometer)
	2. Cover color: selectable from 10 colors, camera: 13 megapixel, processor: 4 x 1.7 GHz & 4 x 1 GHz and software: standard package (basic virus scanner and basic pedometer)
	3. Cover color: selectable from 10 colors, possibility to choose from: 13 megapixel camera and 4 x 1.7 GHz & 4 x 1 GHz processor, 18 megapixel camera and 4 x 1.7 GHz processor or 8 megapixel camera and 4 x 2.3 GHz & 4 x 1.5 GHz processor, software: standard package
	4. Cover color: selectable from 10 colors, possibility to choose from: 13 megapixel

	camera and 4 x 1.7 GHz & 4 x 1 GHz processor, 18 megapixel camera and 4 x 1.7 GHz processor or 8 megapixel camera and 4 x 2.3 GHz & 4 x 1.5 GHz processor, possibility to choose from: standard-software package (basic virus scanner and basic pedometer), business-software package (premium virus scanner and encryption of the smartphone) or fitness-software package (premium pedometer and fitness manager)
ES	1. Hard to repair and to recycle, hardly any use of recycled material, possibly hazardous substances used
	2. Easy to repair and to recycle, hardly any use of recycled material, possibly hazardous substances used
	3. Easy to repair and to recycle, predominant use of recycled material, possibly hazardous substances used
	4. Easy to repair and to recycle, predominant use of recycled material, guaranteed no hazardous substances
SS	1. Possibly child labor, bad working conditions and low wages, possibly use of conflict minerals
	2. Guaranteed no child labor, bad working conditions and low wages, possibly use of conflict minerals
	3. Guaranteed no child labor, fair working conditions and fair wages, possibly use of conflict minerals
	4. Guaranteed no child labor, fair working conditions and fair wages, guaranteed no use of conflict minerals
Price	1. 399€
	2. 459€
	3. 519€

In this study, we used Sawtooth software to design and calculate the CBCA. Based on the number of attributes and levels, we have 192 choice scenarios (4x4x4x3) in total. The definition of attributes and levels can be seen in Table 2. The online questionnaire was spread among Chinese and German university students. The high smartphone penetration rate among students offers effective data collection and two consistent sample groups helping to reduce the sample bias. The questionnaire was created with Sawtooth's SSI Web in English language and translated manually by two native speakers each in a two-step process to Chinese and German. The link for the German survey was distributed via an email list of the TIME Research Area from RWTH Aachen, an email list of the University of Siegen and different student groups in social media. In China the main channel to distribute the survey was Instant Messenger software such as Weixin and QQ.

#### 5. RESULTS AND DISCUSSION

##### 5.1. Sociodemographic data description

We collected sociodemographic data from 250 participants in China and 250 participants in Germany. The average age of the participants in China is 21.75 years and in Germany is 22.57 years. The sex ratio (male/female) in China is 1.17 and in Germany 1.40. In China, 61% of participants had an income level between

0-999 RMB per month, 18.4% between 1000 and 1999 RMB and 20.8% percent more than 2000 RMB per month. In Germany, nearly 47.2% of participants have a net income of less than 500€, 43.2% between 500€ and 999€ and 9.6% earn more than 1000€ per month. Almost 99.2% of participants in China and 98% of participants in Germany own a smartphone. The average price of the smartphones among the participants in China is about 3001 RMB (ca. 392€). The average purchase price in Germany is about 467€.

### 5.2. Relative frequency distribution

The values of the relative frequencies represent how many times a level in an attribute was chosen divided by the number of its appearance [43]. Figure 1 graphically represents the relative frequency of the different levels of attributes in China and Germany. First, we look at the data obtained in China. For the MC attribute, we observe a low increase from level 1 to level 3, but a high increase (about 9%) from level 3 to level 4. This means that software packages in smartphones are highly attractive to consumers. The differences in the relative frequencies for the ES attribute are significantly higher. When level 4 of this attribute was presented to the survey participants, it was selected twice as often as the standard level. This reflects that environmental issues are important to participants, especially smartphones without hazardous substances (selection increase of almost 13% between level 3 and 4). Looking at SS, we can see that the most substantial increase is located between level 2 and level 3. A smartphone with fair working conditions and fair wages seems to be a relatively important stimulus for Chinese participants. Finally, the lowest price was preferred by the participants. The none-option was selected 14% of times it was offered.

Also in Germany, higher levels in MC, ES and SS are more popular than standard levels. Different from the data in China, SS at level 4 was the most selected item. The differences in MC by about 5% between each level is relatively low. The result of ES is similar to that in China. The differences between each level range between ca. 7-9%. In SS, the value of the relative frequencies between level 2 and level 3 differ about 14%. Furthermore, German participants selected a smartphone with a SS less than every fourth time, when it had the lowest SS level. The none-option was selected about 21% of times it occurred.

Comparing the relative frequencies in China and Germany with each other, we observe that in all four attributes the overall tendencies in China and Germany are similar. However, several differences are worth noting. The first one, in ES, while the chosen times kept increasing at a stable rate, the relative frequency increased sharply between level 3 and 4. Combined with the content of the survey, this shows that Chinese participants react stronger on the topic of hazardous substance than German participants. Secondly, in Germany people selected the standard level of SS less than Chinese participants and the increase between levels is stronger for Germans than Chinese. This showed that fair offers in terms of SS are preferred more in Germany than in China. Lastly, German participants are more price sensible than Chinese participants, which is shown

in the slope of the graphic in price. Furthermore, it should be noted that German participants selected the none-option more often than Chinese participants resulting in lower choice frequencies for all levels of attributes.

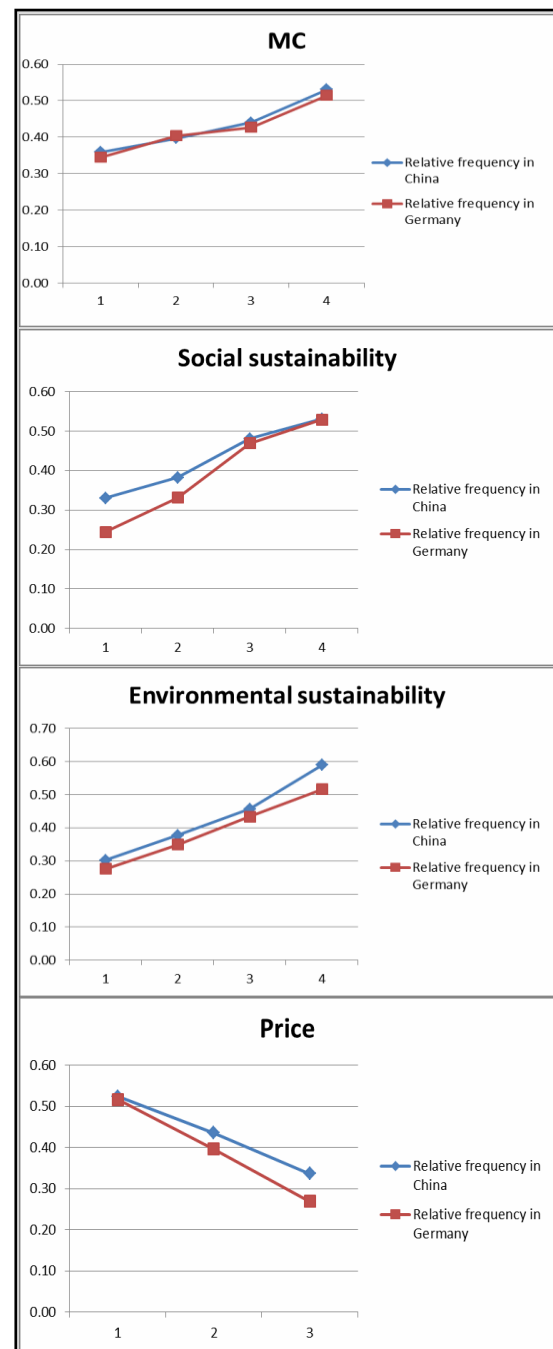


Fig. 1. Relative frequencies in China and Germany

### 5.3. Multinomial logit estimation and relative importance

It is necessary to calculate part worth utilities to test our hypotheses. As recommended by Backhaus et al. (2011), we used multinomial logit estimation to determine the part worth utilities for all participants. The multinomial logit estimation uses all choice tasks of the 250 respondents to estimate the part worth utilities in an iterative way. Four iterations are needed to reach a stable solution. Looking at the chi square values we can

observe that the main effects are highly significant to the null model (Germany:  $X^2(12, N=250) = 288.43$ ;  $p > .005$ ; China:  $X^2(12, N=250) = 896.72$ ;  $p > .005$ ).<sup>1</sup> The partworth utilities are reported in Table 3 in the column “effect”. In both countries, participants ascribed the highest utilities to the highest level of MC, ES and SS and the lowest price.

Table 2: Relative importance in China and Germany

China					
Attribute	Level	Effect	t-ratio	Spread	Relative importance
MC	1	-0.29	-5.43***	0.66	0.1988
	2	-0.13	-2.52**		
	3	0.06	1.17		
	4	0.36	6.97***		
ES	1	-0.54	-9.63***	1.15	0.3477
	2	-0.17	-3.16***		
	3	0.10	1.94*		
	4	0.61	11.47***		
SS	1	-0.42	-7.55***	0.79	0.2382
	2	-0.17	-3.28***		
	3	0.22	4.19***		
	4	0.37	7.09***		
Price	1	0.33	8.00***	0.71	0.2153
	2	0.04	0.99		
	3	-0.37	-8.74***		

Germany					
Attribute	Level	Effect	t-ratio	Spread	Relative importance
MC	1	-0.21	-3.68***	0.54	0.1361
	2	-0.18	3.23***		
	3	0.05	0.88		
	4	0.33	6.21***		
ES	1	-0.54	-9.34***	1.10	0.2788
	2	-0.13	2.45**		
	3	0.12	2.16**		
	4	0.56	10.27***		
SS	1	-0.71	-11.81***	1.30	0.3276
	2	0.24	4.30***		
	3	0.36	6.81***		
	4	0.59	10.84***		
Price	1	0.50	11.45***	1.02	0.2575
	2	0.02	0.52		
	3	-0.52	-11.26***		

Notes. N= 250. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The relative importance is calculated to contrast the relative importance of each attribute. The values of the relative importance are calculated by dividing the spread of each level by the sum of all spreads in every level. The outcome is also presented in Table 3. In China, ES has the highest relative importance with nearly 35%. The SS is next with 24% followed by price with 21.5%. The relative importance of MC in China is only ca. 20%. Unlike in China, SS has got the highest rank in Germany with nearly 33%. Next is ES with 28%. The ranking of MC is even lower than in China with the less than 14%.

<sup>1</sup> The twelve degrees of freedom are the result of the sum of all levels (16), including the none option, minus the number of attributes (4) [44].

#### 5.4. Hypotheses assessment

Finally, we discuss our three hypotheses consecutively. With our first hypothesis, we formulated our expectation that all three attributes of MC, ES and SS have a positive impact on consumer’s purchase decisions and that the overall tendency of attribute influence is similar between China and Germany. We have reason to fully confirm this: looking at Figure 1, we can observe that the frequencies of the chosen levels per attribute increase constantly in China. Especially the steep increase within the SS attribute from level 2 to 3 in China is worth noting. The additional components added in level 3 are fair working conditions and fair wages. With the development of internet technology, news about bad working conditions and low wages have often been exposed, attracting societal attention [45]. Similar patterns in terms of relative frequency and relative importance can also be recognized in Germany. The relative frequencies in MC, ES and SS in each attribute increase also as the levels increase. This implies that all three aspects improve consumers’ willingness to pay.

The second hypothesis is that ES has the highest influence on the purchase decision in China. This hypothesis can also be confirmed. ES has the highest influence on the purchase decision, followed by SS and price. MC has the lowest relative importance. The importance of ES is almost twice as high as that of MC.

Regarding the third hypothesis, we proved that sustainability has a higher influence in both countries. In our analysis, we showed that in Germany SS has the highest influence on the purchase decision, followed by ES and MC. Hence, also hypothesis 3 can be confirmed. Although there are large cultural and developmental differences between the two countries, products with sustainable aspects can improve the willingness to pay in both countries. MC has a limited positive effect (below 20% in both countries).

#### 6. CONCLUSION

With our paper, we addressed an unexplored gap of consumer choice research by exploring the role of both customization and sustainability and their effects on consumers’ purchase decisions in different cultural backgrounds, precisely Germany and China. In doing so, we embedded our analysis in cultural and development theory (Hofstede’s cultural theory, HDI and SSI). Based on these three theoretical concepts, we proposed and assessed three research hypotheses. The results of the analysis show that in both countries consumers consider attributes of MC, ES and SS in their purchase decisions.

Despite differences in terms of culture and development between China and Germany, consumers consider ES and SS concerns more than MC of goods and also relatively more than the price. In China, consumers accorded ES to be most decisive, while in Germany SS has the highest impact on the purchase decision.

These findings have direct practical implications. Firstly, we can affirm that consumers in both regions seek for opportunities for sustainable consumption. The customizability of goods is significantly less important than a socially and ecologically sound way of



production. Nonetheless, we can also affirm that consumers are generally attracted by customizable offers. Hence, there is not only a market for sustainable and customized goods in highly developed but also in developing countries. However, our analysis provides a more granular picture about sustainability issues that matter to consumers in their respective background. In the case of China, environment related improvements are rewarded more than social improvements. For the specific case of smartphones, in Germany, the opposite is true.

### 6.1. Limitations

Despite the meaningful contribution of our study, certain limitations constrain our analysis. Regarding our research design, we carefully created the levels for the four attributes. However, in such a cross-culture study, it is difficult to ensure full compatibility between both countries. Also, we evaluated the importance of MC, ES and SS only with four specifications. Furthermore, some characteristics of the smartphone which we offered are not yet available in the market. We also did not take cost performance ratios into account. Furthermore, the choice situation itself implies certain limitations: Although we attempt to reduce the complexity by cutting-down the number of choice sets, participants could have been overwhelmed. Finally, attitudes towards sustainability and customizability of university students might differ if compared to professionals or elderly people. Hence, the results of our study might only be valid and significant for a limited part of the population.

### 6.2. Future Research

Future research should validate and amplify the results of this study by developing comparable consumer choice experiments while taking into account the above mentioned limitations. It would be interesting, for instance, to analyze consumers' willingness to pay for customizability and sustainability in a way that participants are not bounded to previously defined prices. Furthermore, future research should focus on other consumer electronics goods and products from entirely different sectors. Finally, future studies could assess consumer behavior by directly testing the incorporation of sustainability information in configurators. In this way, researchers can understand how sustainability aims and customization approaches can be combined successfully.

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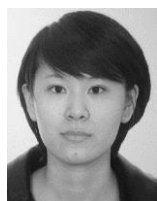
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