

CROSS-CULTURAL USABILITY FOR PRODUCT CUSTOMIZATION ON THE WEB

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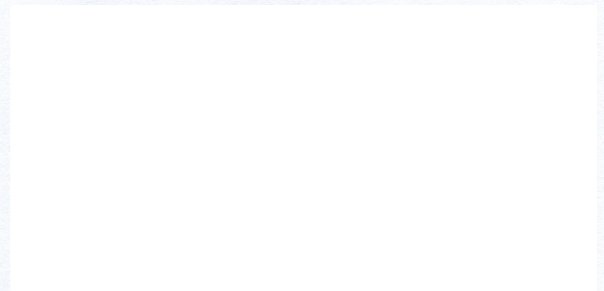


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Abstract

The extent to which peoples' usability assessments vary as a function of their country of origin and the origin of the website in the context of custom products was explored. Twenty-four adults (12 Germans and 12 Americans), ranging from the age of 18 to 25, used four different interfaces to create their own custom product; two interfaces were from organizations based in the US and the other two were from organizations based in Germany. The performance of each culture depended on visual and navigational design, and organizational location; each participant, when completing the tasks, took efficiency and effectiveness into account. Satisfaction was also dependent on efficiency, effectiveness and the overall information architecture of the website. Based on the results, it can be seen that users of websites need content and their overall experience to be designed to their individual needs, including their culture.

Introduction

Although Human Computer Interaction (HCI) is not a new concept, having been used for years to help solve difficult problems in computing, the interest in usability methods and concepts has expanded in the last decade to such an extent that organizations have created divisions dedicated to HCI (Fabricant 2013). While HCI has become a worldwide phenomenon, with many different components ranging from the development of software engineering to the psychological human factors of computing systems, its development has not been geographically uniform. It is developing at different rates in different countries (Toyama, 2010). The reasons for these varying rates of development are not fully understood and need to be further researched. Furthermore, this growing interest in HCI has generated a focus on usability: the design and implementation of webpages and or systems needs to create an experience that is effective, efficient and fun to ensure that the user returns. It has only recently been recognized how important the creation of an engaging user experience is to how humans interact with systems and websites (Walsh 2014).

With this in mind, this study will examine cross-cultural issues in usability, specifically in relation to the customization of products on the Web. Although there have been many studies dealing with cross-cultural usability issues, almost all of these compare sharply contrasting cultures, Western versus Eastern and developed versus still-developing countries, where differences in culture, education, infrastructure and computer accessibility might have important roles to play. It

appears that no studies have compared usability differences between countries with similar cultures and at a similar stage of economic development. To address this gap, this study will examine the differences in usability design between the US and Germany. These countries were selected because both have a similar economic standing and are rooted in “western” influences. Although superficially they seem very similar, this study asks whether there are subtle cultural differences that have an effect on each’s desired usability standards in each country.

The purpose of this research is to investigate the potential differences in how people from the US and Germany evaluate the usability of websites that allow for customization of products. This study focuses on customization, as the most interactive e-commerce platform to date, to accentuate potential differences between the two user groups. This study asks how peoples’ performance and usability assessments, in the context of product customization, vary as a function of their country of origin and the origin of the website that they are asked to use. Furthermore, it seeks to identify the main features of custom product websites used in each country and users’ preferences and/or dislikes in each culture.

As context for the study, it is important to know what exactly culture is. The definition for culture in this study was adapted from Banks and Mcgee (1989) and is as follows: “The core of a culture is not its artifacts, tools, or other physical cultural elements but how the members of the group interpret, use, and perceive them. It is the values, symbols, interpretations, and perspectives that distinguish one people from another in modernized societies; it is not material objects and other physical aspects of human societies. People within a culture usually interpret the meaning of

symbols, artifacts, and behaviors in the same or in similar ways." This study investigates cultural differences in users' interactions with product customization websites.

Literature Review

There have been many empirical studies and reflective pieces on culture, HCI, and how contrasting cultures relate to HCI, but no research that combines HCI and culture for countries that are seen as economically and socially similar. This literature review will first discuss the cultural differences between the US and Germany. It will then present cross-cultural studies related to HCI, concluding with a review of research on product customization. By doing so, it will open the door for more ideas and research in this fast growing sector of technology.

Cultural Characteristics of Germany and the US

In understanding the differences between cultures, it is important to look at the differences in cultural characteristics, based on Hofstede's model; in particular, the cultures being evaluated in this study. When looking at Hofstede's cultural model, it is important to see how it originated and the ways it has been used. Geert Hofstede conducted one of the most elaborate studies of culture on how standards in the workplace are influenced by culture (Hofstede 1983). In doing so, Hofstede analyzed a database of IBM employees' value scores; these were collected between 1967 and 1973. Of the 70 countries in the database, Hofstede ended up using 50 countries and 3 regions in his model. He was then able to use this data to look at six different dimensions in comparison with different cultures (Hofstede 1983). Hofstede's model can be applied to several different concepts, including business, education and research. It is the standard for studies including cross-cultural analysis and has been cited over 54,000 times (Tung 2010).

In comparing Germany and the US (see Figure 1, adapted from the graphic generated online on March 3, 2016, by the Hofstede Centre, <http://geert-hofstede.com/germany.html>), the three main factors identified in Hofstede's model are Individualism, Long Term Orientation and Indulgences. From the model we see that the US has a very high level in individualism; people's self image is defined as 'I' instead of 'We'. This culture is one in which people look after themselves and their direct family above all else. Distant family and strangers have a very low priority. Although the German society is still individualist, and not collective, it is far less pronounced than in America. The German culture still focuses on the parent-child relationship, but is more inclusive, promoting consensus and the well being of the population as a whole (Hofstede Centre). For example, health care for all and trade union representatives have seats on companies' boards. Communication is important for the German culture, and one of the most direct in the world; they go by the motto "honest, even if it hurts." The American culture goes beyond this and completely focuses on the individual and communication isn't such a main point as in the German culture; "communication is informal, direct and participative to a degree" (Hofstede Centre).

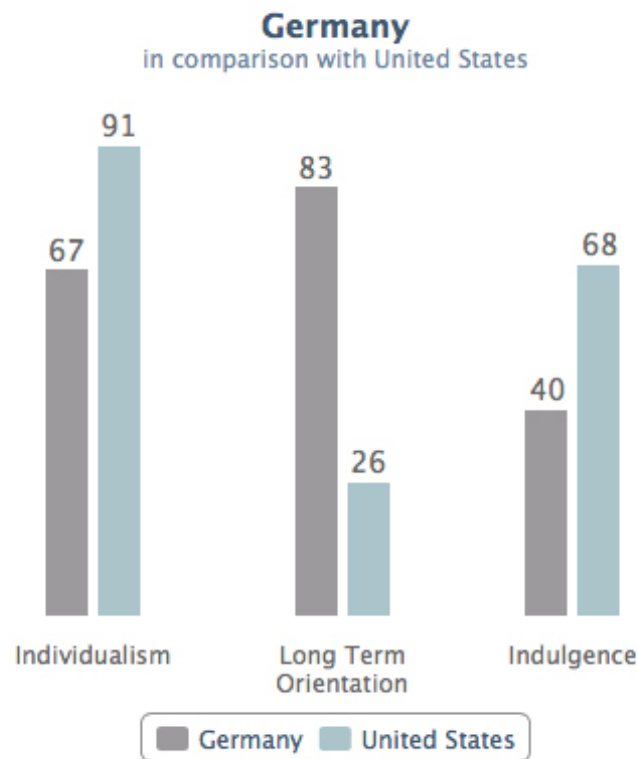


Figure 1. National scores on Hofstede's six dimensions of culture

Next, Long Term Orientation shows that Germany is a pragmatic country. The German culture believes in truth, but this truth depends on situation, context and time. Tradition is a key factor in their culture and they adapt it based on conditions. The German culture is also seen as people who save, invest, and want to see results. This is vastly different from the American culture, where everything is based on a short-term orientation. For example, American organizations issue their profit and loss statements on a quarterly basis. This low Long Term Orientation boosts the idea of Individualism even more, striving for quick results for the individual (Hofstede Centre).

Lastly, the difference in Indulgence can be seen between the two cultures. The German culture is seen as restrained in nature and does not put much emphasis on luxury consumables; they feel that indulging is wrong and not the social norm. On the other hand, the American culture has a high rating in indulgence; the motto “work hard and play hard” is something many Americans live by. Their high score is illustrated by looking at America’s war on drugs; in spite of their strong action against drugs, drug addiction is higher in America than in many other economically similar countries. Americans have the tendency to indulge on a short-term basis and very frequently. This is further illustrated by America’s low saving rates and high consumer spending (Hofstede 2005).

These three cultural differences may have an impact on the way each culture judges usability or product customization design. It is expected that the long-term orientation of the German culture will result in a preference for a design that monitors progress towards finalization of a task and the American culture will focus in a speed oriented design. The strong individualism of both cultures should mean that both are interested in the individualization of products, such as custom text on shoes and custom colors on cars. Lastly, indulgences suggest that the German culture will not be driven by brands, but rather by functionality over aesthetics.

Overview of HCI and Cultural Differences

In recent years HCI has raised issues associated with cultural development and user centered design. In this context, it is important to understand how access to the Internet influences users’ performance and usability expectations. According to data from the World Bank (2016), Internet use in the last four years in almost all

countries worldwide has dramatically increased. Internet users are defined as people who have accessed the “Internet in the last 12 months from any device, including mobile phones” (Individuals using the Internet 2005 to 2014). This same study, which looked at 100 people from each country to derive a percentage of internet usage, came up with some surprising results; the US and Germany were ranked 22nd and 23rd with 84.2% and 83.96% Internet users respectively (Individuals using the Internet 2005 to 2014). Accordingly, Internet experience and usage may not be an important factor when investigating the influences of HCI in these cultures.

As Human Computer Interaction and cultural ties to technology continue to expand, it is important to understand the literature that covers the interaction between both fields. Interestingly, 40% of the relevant studies left out the definition of culture, a rather tricky and broad term (Kamppuri 2006). The majority of studies that define culture tend to cite Hofstede’s work in the field. However, there exists a general lack of coverage and study when it comes to “non-mainstream” cultural HCI. Mainstream cultural HCI is defined as human computer interaction pertaining to cultures from opposite ends of the spectrum; the focus is on trying to bridge the gap between the obviously diverse groups. (Kamppuri 2006).

In analyzing cultural differences between countries, it is important to look at how previous studies conducted their research. Interestingly, Clemmensen and Roese (2010) ran a study, which focused on analyzing journal publications relating to culture and HCI from the last ten years. Clemmensen and Roese’s findings show that 20 of the 27 studies are quantitative instead of qualitative; this is due to the

higher cost of having an expert for a qualitative study. Of the 27 studies, nine used the Hofstede model, six used another model of culture, and 12 didn't use a model at all. This is concerning in that the studies are comparing cultures in terms of their interaction with computers, but not actually looking at the characteristics of each culture. The study also showed that most studies focus on the Asian market and its counterpart, the US; "Studies of cultural usability focus on relatively few different countries, with China (32%) or US (33%) as the anchor country in most of the studies" (Clemmensen & Roese, 2010, p. 105).

Lachner et al. (2015) show that there is gap in the study of HCI and cross-cultural usability. He shows that UX designers know that they have a problem when it comes to localization and designing cross-culturally, but have not found an effective way to understand and fully develop their designs for each culture. Using qualitative data, they describe the German culture as follows: "Germans appreciate functionality ('In Germany the aesthetics are strongly related to the technical features of a product') and prefer high quality products ('Germans rather spend a little extra and it might not look as fancy but it will work better for a longer period'). In Germany it was not about the brands or looks it was about quality and performance. Although relationships are important for Germans they are in general initially reserved towards strangers ('You really have to make a real big effort to become a part of a community')" (Lachner et al., 2015, p. 66). This description along with Hofstede's cultural model allows for a better understanding of the German culture when analyzing and discussing the data found in this study.

Bourges-Waldegg and Scrivener (1998) highlight the importance of understanding and reacting to the culturally determined usability characteristics by using localization and internationalization. The studies they reviewed recognize that the way the user interacts with and uses the tool is different in certain cultures, particularly in vastly different cultures; specifically color has been identified as being a potentially important driver and is being used in the localization of design.

Although past studies illustrate general high-level influences of cultures on HCI, they do not investigate in depth how and where differences occur, especially between cultures of similar social and economic standing. People appear not to be sure how to respond, adapt and take advantage of the rapid expansion and evolution of HCI. Dearden et al. (2007) explain that researchers must work together, especially in poorer developing countries, to understand how user centered design can help boost and further these cultures. This has become a challenge for which many are searching for an answer. At the more developed end of the cultural spectrum, researchers are trying to understand how to make users' experiences that much better.

Lindgaard et al. (2007) explain how visual appeal and trustworthiness are two factors that will make users keep coming back. First impressions are not only important in face-to-face contact, but also in HCI where the initial impression of appearance affects the perception of reliability, usability, information quality, usefulness, and user satisfaction.

Considering the importance of visual appearance, art is an essential element in designing the usability of systems and websites. In addition, Nam and Nitsche

(2014) state that interactive installations have had a strong impact on both the world of art and HCI. By making the installation interactive, the user is engaging with the product and feeling a sense of loyalty to it. By drawing out emotions from the user, the system will create a better overall experience. Emotion and art by themselves are not enough; the optimization of HCI in a particular culture is based on combining these two factors in relationships dictated by the specific culture. Each presentation of information may be different based on cultural specification. Reinecke and Bernstein (2011) identify how cultural ties such as religion, language, form of education, and social norms all have an influence on a region and its HCI. Although they tested 41 different participants from 25 different countries, based on the study's limitations, their results were inconclusive about whether one system was better than another; they used only the US system.

Glöss (2012) is of a similar mind set to Reinecke and Bernstein in believing that the role of digital products, in a cultural context, is to serve the practices of a certain user. Culture must be understood and taken into account to deliver better usability for the end user. Studying and reacting to the way cultures affect HCI will allow for a deeper understanding of users' needs (Glöss, 2012).

Cross-cultural differences are evident even when just surfing the Internet. It's easy to understand that peoples' preferences would be different; the difficult part is to understand how to cater to different cultures simply by being culturally sensitive. In this respect, Anbari et al. (2003) use Hofstede's insights of power distance, uncertainty avoidance, individualism, masculinity, and long-term orientation, to focus on what they consider to be major cultural differences: relationships between

people, motivational orientation and attitudes towards time. When looking at cross-cultural differences, this emphasizes the importance of being able to identify and understand the factors that impact the collective group both positively and negatively. This approach will help with the organization, presentation and gauging the effect of information in a system. In essence, when presenting and studying the user experience of a certain culture, principles that correlate to the respective culture must be examined and understood.

When dealing with culture and HCI it is important to approach the situation both objectively and subjectively. Ford and Kotzé (2005) explain how international and localized approaches are both needed in developing the use of a product for diverse cultures; this is especially true for technology products. For a product that is being sold all over the world, it is important to present it in a way that caters to the culture of the particular target market.

Empirical Studies of HCI and Cultural Differences

There are a very limited number of usability-related cross-cultural studies. Studies that are being included in this review must meet certain criteria; they must compare at least two different cultures and must also look at the design and usability of web platforms rather than software or hardware. Furthermore it is a benefit, but not a requirement, if the study includes one of the cultures that will be looked at in this study. Three studies meet these criteria (see Table 1).

Table 1. Cross-cultural usability studies

	Mandl (2009)	Al-Shamaileh & Sutcliffe (2012)	Cyr, Head, & Larios (2010)
Number of cultures studied	2	2	3
Technology platform	Web	Web	Web
Countries included	China / Germany	UK / Jordan	Germany/Japan/Canada

Moving from a broad understanding of culture and HCI to the more specific, Mandl (2009) examines the differences between German and Chinese blog features based on cultural and users' needs. Mandl looked at 409 blogs in China, one of the fastest growing markets in the world, and 98 blogs in Germany. This enabled him to postulate why cultures blog in a specific way in relation to their cultural differences as defined by Hofstede and Hofstede (2005). The study had limitations in that the Chinese out-numbered the German blogs, which caused for a skewed data set (Mandl, 2009).

In a study similar to Mandl's, Al-Shamaileh and Sutcliffe (2012) looked at HCI in two very different cultures; instead of blogs, they looked at health websites, using 86 participants from the UK and Jordan. Three different websites with three very different designs were examined. They found that content and brand had significant influences on their preference selection, but not their task performance (Al-Shamaileh 2012). This is something to take into account when considering why a particular culture has a preference for certain brands.

Continuing the trend of studying HCI in vastly differing cultures, Cyr, Head, and Lario (2010) studied the differences in website color appeal to users in Germany, Japan and Canada. Color appeal, based on the culture's preference, were

found to evoke trust and e-loyalty. Cyr et al. also touch on how brand recognition, through its association with color, can once again cause bias in decision-making.

From these three studies, it was learned that each culture reacts differently to designs and experiences on the web. Even cultures that are seen as economically and socially similar reacted differently. Color, features and brand are all components that must be studied when localizing a design.

Product Customization

It is becoming recognized that users want to make their online experience unique. From the early 21st Century, with the growth of the customization of MySpace profiles and creation of social identities, it has been seen that users like to be distinctive. (Boyle & Johnson, 2010). This is particularly significant with the growth and globalization of e-commerce. According to Vandermeer et al. (2000), online personalization has been proven to increase buying probability. The platform is interacting with the customer, leading to stronger relationships between user and business (Yang & Padmanabhan, 2005).

Although web personalization is emerging as a major field of research (Vandermeer et al., 2000), most of the research is focused on data mining and collaborative filtering to boost the amount of related or similar items that are seen by the consumer. There is very little research on the topic of personalizing custom products on the web (Vandermeer et al., 2000). Today, users have customized profiles, created by online vendors and hidden from them that anticipate their preferences; these “consumer profiles are constructed by online vendors based on various criteria, and different matching techniques are used to personalize products

and services for a particular consumer profile”(Chellappa & Sin, 2005, p. 185). The users have little to no control in these interactions, making the process an aid rather than a tool.

Customization is critical to online vendors in their day-to-day operations; being able to cater to a large audience with limited resources provides operational efficiency (Chellappa & Sin, 2005). As e-commerce companies begin to recognize the potential for user involvement, the use of consumer choice is transitioning to an open environment, in which the consumer has the ability to express his or her preferences in the creation of the final product. However there is “currently little academic literature on online personalization” (Chellappa & Sin, 2005, p. 184), how users are reacting to this shift and how culture affects consumer preference. This raises the interesting question of whether and how global brands should localize their websites.

Research Questions

In view of the rapid ongoing expansion and “internationalization” of e-commerce, and limited studies in the field, research is urgently needed into how personalization in relation to cross-cultural usability creates an improved user experience. This study addresses this need by investigating three specific research questions:

- 1) Is user performance in completing a product customization task affected by cultural differences?
- 2) Is user satisfaction with a product customization website affected by cultural differences?

3) Are user preferences for websites affected by cultural differences?

In this study, user performance was represented by the number of steps taken to complete the assigned task, user satisfaction was measured with the System Usability Scale (SUS), and user preferences were gathered via an interview. Cultural differences were represented by the match or non-match between the user's country and the country in which the website was developed. Lastly, the study used a think aloud process to more completely understand the preferences of each culture, based on features, design and organization.

Methods

The study included 12 German and 12 US participants. Individual sessions were conducted remotely and consisted of the participant completing product customization tasks on four different websites. Before and after each task, participants were asked to fill out questionnaires and had short interviews explaining their preferences in websites and task completion. Each session ran approximately 35 minutes and participants could opt out at any time. Data was analyzed by calculating performance and satisfaction scores and comparing these across the websites; think-aloud and interview data was analyzed qualitatively. The study methods are described in more detail below.

Sample

To qualify for the study, the participants must have met certain criteria. Culturally, they must not have lived outside of their respective country for more than one year and their native language must have been that of their country of origin. An age qualification was also set for participants in the study; this was introduced in order to minimize the impact of Internet awareness and manipulation skills on the study. Participants must have been between the ages of 18 and 25, as this age group is expected to be familiar with the Internet; this means that results are expected to relate to the usability of the product rather than to Internet skills.

The participants were identified through US and German contacts at universities. The German contacts allowed for participants from all over Germany to participate and the US contacts for participants all over the US to participate. The

snowball method was also used with each participant to get in touch with additional potential participants in each country.

The participants had to qualify for the study by filling out a pre-session questionnaire (see Appendix 1). In the pre-session questionnaire, the participants were asked their age, native language, country of birth, primary country of residence, and how long he or she has lived outside his or her country of primary residence to make sure they were qualified to participate in the study. The participant was then asked how much time he or she spent on the Internet to assess his or her Internet skill level. They were then asked two brand preference questions to make sure those preferences wouldn't inappropriately influence their attitudes about the websites with which they interacted. After completing the pre-session questionnaire, the study session was scheduled with each eligible participant. Participants received a \$5 Amazon gift card for participating in the study.

Variables of Interest

This study focused on user performance and user satisfaction/preferences when using a website in which they could customize a product. User performance is defined as the process of how well a user did carrying out or accomplishing the task. It was operationalized as the number of steps that it took the user to accomplish each assigned task. Time was purposely not measured due to the qualitative measure of the think aloud process. User satisfaction is defined as the user's feeling of fulfillment, or the pleasure derived from the experience of the tasks. It was measured using the System Usability Scale (SUS), a 10-item questionnaire that has been widely used to evaluate the usability of websites (Brooke, 2013). The SUS test

is a global measure for satisfaction, usability and learnability. It is reliable, having been shown to detect differences “at smaller sample sizes than home-grown questionnaires and other commercially available ones” (Sauro, 2011, n.p.). This means that the SUS questionnaire can be used with any size sample and still result in valid analyses. It is important to understand in the analyses that according to Sauro, there is only a modest correlation (roughly $r=0.24$) between SUS and task performance. Users may encounter problems with a system and still provide scores that seem high. Sauro found that only about 6% of the SUS scores “are explained by what happens in the usability test” (n.p.). In addition to the SUS scores, expressions of satisfaction and dissatisfaction occurred during the think-aloud protocols collected during task completion. User preferences among the four websites were expressed during the post-session interview. The post-session interviews did not yield the type of quantitative data on preferences that was anticipated, but instead yielded additional qualitative data in comparing the various websites.

The study investigated the effect of the culture in which the interface originated on the variables of user performance and satisfaction. Four websites were selected: Jeep and Nike from the US, and Audi and Adidas from Germany. Nike and Adidas are shoe websites where users can browse pre-made shoes or customize their own to purchase online. Jeep and Audi are automotive websites where users are able to select the car they want, customizing features to modify it to the user's preference. Each website was selected because of its well-known brand in both cultures. Each participant interacted with all four websites.

Study Procedures

The core of the study protocol was the completion of four product customization tasks, one with each website. During task completion, there was a think aloud process where the participant spoke what they were thinking while completing the tasks. The think aloud process for the German participants was carried out in German; the English translation is shown in the results and discussion section. Each task was followed by a post-task questionnaire. In addition there were a pre-session questionnaire, two mid-session interviews (one after each pair of tasks / interfaces), and a post-session interview.

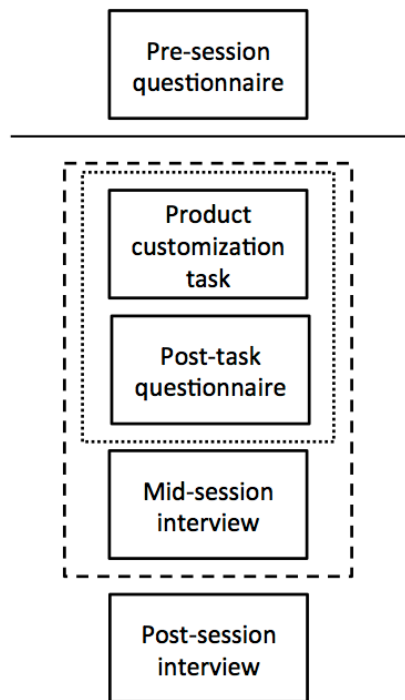


Figure 2. Overall Procedure

Qualtrics was used to administer the pre-session questionnaire and post-task questionnaires. The UNC-CH Institutional Review Board approved these study procedures.

The study was conducted remotely. The user remotely accessed GoToMeeting and shared his or her screen with the investigator. The participant was then reminded that he or she would be recorded and the investigator began recording the session. The sessions with the German participants were conducted in German and those with the American participants in English. The material was translated into German for the German participants, but was not back translated to verify the quality of the translations. There was no misunderstanding or lack of clarity showed by the participants in the sessions.

In the study session, each participant completed four product customization tasks (Appendix 5), one with each of four websites: Audi and Adidas (a car company and a shoe company headquartered in Germany) and Jeep and Nike (a car company and a shoe company headquartered in the US). The US participants used English interfaces and the German participants used German interfaces of the same websites. The tasks were ordered using a counter-balanced design. Half the participants began with the shoe company interfaces, and half the participants began with the car company websites. Within the pair of shoe company interfaces, half of the participants began with Adidas and half with Nike; within the pair of car company interfaces, half of the participants began with Audi and half with Jeep. At the beginning of the session, the user was emailed a task list to complete. The task list contained links that sent the participant directly to the page of the pre-selected

products. Participants were asked to think aloud as they completed the tasks; their comments were recorded as part of the study session.

After completing each task, the participant completed the SUS (Appendix 3), which measured the user's satisfaction with the website. After completing the pair of tasks associated with each interface group (shoe or car sites), the participant was briefly interviewed (see Appendix 2 for the interview guide). The purpose of this interview was to ascertain which of the two comparable websites they liked better and why, in order to understand the aesthetic and functional preference of a specific culture.

At the end of the study session, the participants were interviewed again. This interview was specifically used to reiterate and finalize the reasoning and choices made by the participant. It also gave the investigator the opportunity to discuss topics the participant mentioned during the think aloud process. In this final interview, the participants were asked to comment on all four websites, their preferences for particular websites, and the potential influence of the company's country on their preferences. The user was then debriefed and thanked for his or her time.

The entire study session lasted approximately 35 minutes. That allowed two minutes for each post-task questionnaire, three minutes for each mid-session interview, and five minutes for the post-session interview, leaving 15 minutes for the participants to complete the four tasks.

The data collected through this protocol included: 1) ratings of user satisfaction with each of the four interfaces; 2) user preferences for particular

interfaces, from the interviews; 3) user performance data, in the form of errors made when completing the tasks; and 4) qualitative data related to the users' perceptions of the usability of particular features on the four websites.

All of the data gathered was stored on a remotely secured USB key that was encrypted and the researcher's laptop. The data from each participant was temporarily stored on the computer in Manning 250; after each session, the data was transferred to the researcher's computer and erased from the computer in Manning 250.

Data Analysis

The number of steps that the participants took to complete a task was calculated. In addition, the ideal (i.e., minimum) number of steps needed to complete the task was calculated for each task. Steps were counted by clicks and half page scrolls; half page scrolls are when the participant scrolls below the fold to see another half of the website. The number of steps taken above the ideal were considered to be errors. The ideal for the two shoe tasks was 9 steps; the ideal for the two car tasks was 10 (see Appendix 10). If participant X needed 20 steps to complete one of the shoe tasks, he or she would be 11 steps over the ideal number of steps required, recording 11 errors.

A SUS score is calculated by adding and subtracting numbers based on whether a negative or positive type of question is being asked. In the case of a standard SUS evaluation, 1 is subtracted from the user's response if the number of the question is odd and the user's response is subtracted from 5 if the number of the question is even. This scales all the values from 0 – 4, with 4 being the most positive

response. The scores for each question are then summed and multiplied by 2.5 to convert the range to 0-100.

The data was analyzed in relation to each of the three different dependent variables of interest. First, the data on task performance was analyzed. Repeated-measures ANOVA was used to analyze the number of steps, comparing the four websites. Secondly, user satisfaction was analyzed. Repeated-measures ANOVA was used to compare SUS scores across the four websites. Lastly, user preferences, expressed in the interviews, were analyzed using a chi-square test. The qualitative data was analyzed by dissecting the think-aloud and interview transcripts. Notes were made at certain times within the interview to mark important comments or details described by the participant, and used to interpret the quantitative results.

Results and Discussion

Participant Description

The participants selected for the study had to meet certain criteria as discussed in the previous chapter. From the pre-session questionnaire, a large difference was observed between Internet usage in the two cultures; over 90% of the Americans spent more than 6 hours a day on the internet, which compares to only around 15% of the Germans. Half of the American participants spent 9+ hours a day using the Internet, five spent between 6 and 8 hours a day and one participant spent 3 to 5 hours a day. This was drastically different from the German participants; half spent an estimated 0 to 2 hours a day using the Internet, four spent between 3 and 5 hours and two between 6 and 8 hours a day. It was clear to see that half the American participants were at the top end of the spectrum in Internet use and half of the Germans were at the bottom. This was taken into consideration when analyzing the data based on cultural significance and overall Internet experience when it came to usage of the websites. This breakdown is shown in Table 2.

Table 2. Participants perceptions of their Internet use per day

	American	German
0-2 Hours	0	6
3-5 Hours	1	4
6-8 Hours	5	2
9+ Hours	6	0

There were no significant brand biases reported for automobiles or shoes (in the pre-session questionnaire) based on culture.

Performance: Number of Steps

When looking at task performance, the main focus was to look at the number of steps (i.e., clicks and scrolls) it took for the participant to complete the tasks. The mean number of steps taken by each group of participants to complete each task is shown in Table 3. The minimum number of steps for the shoe tasks was 9 and the minimum number of steps for the car tasks was 10 (see Appendix 10).

Table 3. Mean steps taken

	Germans		Americans	
	Mean	Confidence Interval	Mean	Confidence Interval
Audi (German)	14.5	11.6 – 17.3	15.2	12.3 – 18.0
Jeep (US)	31.9	26.1 – 37.7	18.2	12.4 – 24.0
Adidas (German)	14.3	12.1 – 16.4	12.0	9.8 – 14.2
Nike (US)	13.3	11.4 – 15.1	11.0	9.2 – 12.9

Except for the German participants' use of the Jeep website, where an average of 32 steps was recorded, the average number of steps stayed between 11 and 18. Given these data, it was found that completing the task on the Jeep site required 22 extra steps, beyond the ideal, for the Germans. Across the other sites, it took the study participants only 2-8.2 extra steps to complete the assigned product customization tasks.

These differences were investigated through a repeated-measures ANOVA, conducted for each pair of websites (cars: Audi vs. Jeep, and shoes: Adidas vs. Nike).

There is a statically significant relationship between culture and the number of

steps needed to complete the tasks on the Audi and Jeep sites ($F(1,22) = 10.979$, $p = .003$). Clearly, it took many more steps for the Germans to complete the Jeep customization task, while there was no real difference between the Americans and the Germans for the Audi customization task. There is no statistically significant interaction between culture and the number of steps needed to complete the tasks on the Adidas and Nike sites ($F(1,22) = .000$).

This shows that the biggest result of steps taken formed the experience with the Jeep and Audi websites. This is not surprising in looking at the features and path needed to complete the tasks for each culture. First and foremost, from the beginning, the German participants found the Jeep website problematic to use; not just from a cultural standpoint, but also from an HCI perspective. The website didn't follow its own systematically constructed flow. Rules seem to change and the user is expected to know this without prior experience.

Next we found that there wasn't a significant interaction with the shoe tasks and websites; again, this was not surprising as both customization tools are very similar, with modified features that both cultures seemed to favor. The design of the shoe websites appeared to be based on common human characteristics, trying to cater to international audiences, rather than on localization features that might diminish overall appeal. This was effective, resulting in a small number of steps being taken to complete the shoe customization tasks.

User Satisfaction

The SUS questionnaire was administered after each task to measure satisfaction. For both groups, for all the sites, the mean scores ranged from 63.5 to 81, except for the Germans' evaluations of the Jeep site (mean score = 28). See Table 4 for all mean scores.

Table 4. Mean SUS scores

	Germans		Americans	
	Mean	Confidence Interval	Mean	Confidence Interval
Audi (German)	73	52.7 – 64.2	63.5	50.3 – 59.1
Jeep (US)	28	17.8 – 26.6	68.5	45.2 – 56.6
Adidas (German)	81	58.8 – 71.1	68	48.4 – 60.8
Nike (US)	74	53.1 – 65.3	75.5	54.3 – 66.6

These differences were investigated through a repeated-measures ANOVA, conducted for each pair of websites (cars: Audi vs. Jeep, and shoes: Adidas vs. Nike). As expected, there is a statistically significant interaction between culture and the SUS score achieved during the car customization tasks ($F(1,22) = 75.606$, $p = .000$). There is a smaller, but still statistically significant, interaction between culture and the SUS score achieved during the shoe customization tasks ($F(1,22) = 5.706$, $p = .026$). These results are illustrated in Figure 3.

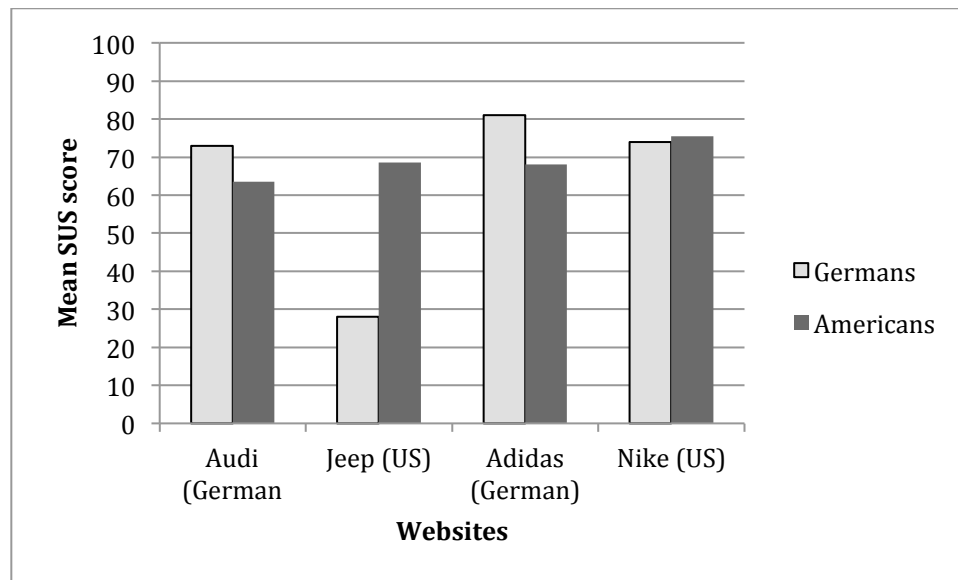


Figure 3. Mean SUS scores

The results show that the American participants had a relatively close scores with all of their websites, but slightly favored the American organizations' sites over the German. The same is true for the German participants and German-based organizations. The biggest difference was the Germans' mean SUS scores of 28 for Jeep and 73 for Audi. According to Sauro (2011), a SUS score of 68 or higher is above average. Anything under is seen as below average. The participants from each culture were satisfied at around an average or above average level except for the Germans' low ratings of satisfaction with the Jeep site.

When looking at the SUS score and the steps taken for each task, it is important to see if they are correlated. Based on the average number of steps taken (reported earlier), excluding the Germans' use of the Jeep site, user satisfaction would be expected to be relatively high, as it was. On the other hand, the German

Jeep website seemed to give a negative experience for the user, in terms of both performance and satisfaction.

A difference of three or four steps to complete the tasks does not appear to result in a higher SUS score; this illustrates that being efficient by a few more clicks does not necessarily affect satisfaction. There are other components and elements, such as visual design and integrated features, which influence the formation of the overall experience.

This was seen with statements made by the German participants. For instance, participant 14 stated that their experiences on the Nike and Adidas websites were very similar. Although it took three fewer steps to complete the customization task on the Adidas site, features such as the check marks, showing what component of the customization they had completed, and a straight forward, simplistic design, which meant that they did not get lost or confused, contributed to the participants favoring the Nike website. The participants may have had to do more to complete the task, but the overall experience made them favor the Nike website.

Statistical correlations between performance and satisfaction were also examined (see Table 5). When looking at the correlations, it is clear that there is a significant correlation between the Jeep SUS score and the number of steps taken. This is a strong, negative correlation between the two variables, as expected from inspection of the mean scores on those variables. The rest of the correlations were not statistically significant, which was expected from the prior research done by

Sauro (2011). This finding helps to emphasize the extreme divergence in the Jeep website's satisfaction and step count results, with the German participants.

Table 5. Correlations between task performance and satisfaction

	Pearson Correlation
Audi SUS x Audi Steps	.193
Jeep SUS x Jeep Steps	.625**
Nike SUS x Nike Steps	.334
Adidas SUS x Adidas Steps	.170

** Correlation is significant at the 0.01 level (2-tailed).

Qualitative Results on User Satisfaction

Concepts described by Garret (2011) were seen, based on qualitative data from post-session interviews, the think-aloud process and the mid-session interviews, as the major factors influencing appeal to users from both countries. Visual Design includes elements of balance, aesthetics and the website's overall presentation based on graphical look and feel; this includes colors, positioning of shapes and/or text, and images used (Garrett 2011). One of the biggest differentiating factors brought up by each culture was the use of color and its meaning. Color is something that needs to be taken into consideration when localizing design; interestingly, in Germany the color yellow, used in the German Jeep website, does not have the same negative connotation that it has in the US, being associated with cowardice. Furthermore users from an open culture such as the US have a strong preference for visuals in design, whereas "users from a less individualistic cultures such as Germany prefer a logical and structured page layout

that can be seen as more text heavy” (Sun, 2001, p.100). This relates to the users’ “emotion” and what they are used to seeing (Cyr 2005).

Navigation Design is the design of the navigational scheme to be used to complete a task; this incorporates the flow and informational architecture used in designing the website (Wulf et al., 2006; Garrett, 2011). “No matter how thorough the information content of a site is, a customer who has difficulty in searching and getting the needed information is likely to leave the site” (Mckinney 2002, p. 308). Participants from each culture expect to effectively navigate the website and, in doing so, will experience satisfaction in completing the task. This would raise the participants’ scores in their evaluation and hopefully would lead them to return to the website.

Preferences for the form of navigational scheme are expected to vary by culture (Marcus & Gould, 2000). Simon (2001) found that Europeans prefer navigation that enhances movement and makes the site simpler to use. Germans “feel anxiety about uncertain or unknown matters” (Marcus & Gould, 2000, p. 39), and therefore prefer “navigation schemes intended to prevent users from becoming lost” (p. 41). This anxiety about the unknown is illustrated by the Germans’ reluctance to accept cookies in the Jeep website.

In looking at the information based on Visual and Navigational Design, the participants showed their preferences for each website during the think aloud process.

Comments on the Jeep site

The factor in the German Jeep website design that was most frequently discussed was the recurring theme of (lack of) information architecture. Several German participants stated that the website didn't follow its own flow; they would learn how to operate the website and then in the next step, the website wouldn't follow its own rules. This was particularly upsetting and required a learning curve that took some time to master. Participant 16 stated that they "don't know what to do next...honestly, I would just exit out and find another car similar to Jeep." This was a common theme, being stated multiple times by participants. Participant 16 even stated that, "I've seen a rise in Jeep cars in Germany, but this surprises me. With such a dysfunctional website, I'm surprised anyone can even navigate to purchasing one. This website does not reflect a very strong image for Jeep." The complicated information flow and design hindered participants from even wanting to personalize their own Jeep, not because they don't like Jeeps, but because of the experience of using the website.

Another factor influencing the German participants' negative reaction to the Jeep website was the fact that every user must accept cookies and data collection from Jeep in order to personalize their car. The German culture is very security conscious and suspicious in nature; statements were made, such as, "I wouldn't even start the customization process – why does jeep need my computer data? If I want an SUV that bad I can just go look at VW's where they don't ask me for all my information...I just don't trust that." This reinforces Marcus and Gould's (2000) statement that Germans "feel anxiety about uncertain or unknown matters."

The dark overall color and theme of the customization tool was also frowned upon; “why not just make it Jeep’s colors, like green, or keep it white and grey. I’m buying a car and don’t want to feel like I’m on the dark web...like some sketchy website where things don’t work properly.” The Visual Design and Navigational Designs were seen as poor by the majority of the German participants and were something they struggled with in the process.

The American participants also identified a negative factor in Jeep’s website design. It relates to the information architecture and where things were located; the American participants had a little more experience with this, but still made statements that things were not where they expected them to be. They had to search for features, which they normally would have never seen if it weren’t for the task description. Participant 6 stated, “The design behind some of the features is distracting and not forthcoming. Having a more obvious design showing that ‘this is where I can find heated seats’ would be better. The placement of the navigation or organization isn’t a problem; it’s mainly not knowing that there is a toggle switch there.” This was a common problem found with the American participants, but not significant enough for them not to use the Jeep website, or deter them from using it in the future. On the other hand, some of the features of the website were favored by Americans. Participant 1 stated, “I really like this. You can see the updates get made to the car directly on the screen...just a neat experience I like seeing.” American participants believed that they performed better on the Jeep tasks and this was a major factor driving a positive preference.

Comments on the Audi site

Audi seemed to be a favorite website in both cultures. They keep a consistent design and flow that represents their brand and results in a simple-to-use website. Participant 19 went as far as to say that, “all customization websites need to be like this. The bland colors don’t take away from the actual car – the color that pops out is the car and that’s how it should be. Jeep needs to do it like Audi, because they’re on to something.” The timeline feature, available only in the German version, that shows how far the user is in the process, allows the user to know what they have left to personalize; this feature was admired by all German participants.

The American Audi website was praised for its single page feature; “everything is just there. You don’t have to guess if you missed anything and know you are checking everything off your list. It’s just simple and makes me happy.” The participant went on to show that the Audi website was much like that of shoe personalization sites, in that it’s all in one page in a drop down method: “I don’t have to go back or find what I missed. I can just scroll and that’s really cool.” The Audi website was also praised for its capability to save, estimate payments and even contact a dealership with the users custom selected features. The design even lets users view details of their car customization once they have finished the process. The rotating images at the top had “+” buttons that allow users to add on the features they see in the images, navigating them to the correct package: “it’s easy and will make me probably add more features to my car after I see what all it can do.” Audi was a favorite in both cultures and a model they believe needs to be replicated.

Comments on the Nike site

The German participants were neutral about the Nike website; there wasn't much wrong with it, but it wasn't anything special. Participant 16 stated, "It gets the job done, which I guess is what you want, but it doesn't stand out to me. It looks pretty generic and could be any shoe online designer, but I guess it's easy to use. It just isn't special to me." 'It gets the job done' is a statement that was used throughout the German participants' experiences. Nothing was wrong with it, but there wasn't anything that would draw them to it.

On the other hand, Nike was a favorite amongst the American participants: "I like knowing what I have to do right then and there. I know what I've done and what I haven't, and if I mess up, I don't have to refresh or start back over." Participant 4 was a strong advocate of the Nike website, stating, "You aren't taking away from the actual product and design. I want to see the shoe and what changes I am making. I want it to be easy and quick. I'm making this 'MY SHOE' and that's what I want to see, not Nike everywhere." The simplistic design and navigational features were viewed as positive in the American culture and something that they said would keep them coming back.

Comments on the Adidas site

When looking at the Adidas website from the German participant perspective, they saw it much like the American participants saw the Nike website: simple, easy to use, and all about the shoe. Participant 24 stated, "I like it that there's not much going on. Most of the page is just the shoe, which wasn't the case with the

Nike website...it's not focusing on the features and how you pick, but with what you pick." The size and placement of the navigation was a key component in their decision.

This same reason is why the American participants preferred the Nike website. Participant 11 stated, "it was confusing and I ended up doing the same thing twice not realizing it." It didn't take the participants a lot of extra steps to complete the task, but it was enough to frustrate them.

Preferences

The users' satisfaction and preferences all related to their overall experience and to how each organization focused their design to the specific culture. The reasons gathered above in the qualitative, post-session and post-task interviews all show and explain the preferences based on navigational and visual design. Audi was a clear winner in the German culture and Jeep tied with Audi in the American culture. More importantly, the American participants favored Nike over Adidas by almost a factor of 3, but the German participants only preferred Adidas by a sliver. When grouping the organizations based on its nationality, each culture selected in respective nationality. Does this mean certain organizations are doing a poor job catering to other cultures, or are the organizations that are rooted in that country just doing that much better?

Preferences were determined by using interview guides (Appendices 2 and 4) to direct the conversation and identify the participant's favorite websites and features. In looking at the selection based on country of birth and where the organization is located, the study compared the number of participants preferring

particular sites and used Fisher's Exact Test to see if there was any relationship between the two was statistically significant. These data are in Table 6.

Table 6. Participant preferences

	Number of Germans	Number of Americans
Preference for one of the car sites		
Audi (German)	12	6
Jeep (US)	0	6
Preference for one of the shoe sites		
Adidas (German)	7	3
Nike (US)	5	9

Fisher's Exact Test indicates there is a statistically significant relationship ($p=.014$) between where the participant was born and the website they selected as their preferred car website. While the Americans were evenly split between Audi and Jeep, no Germans preferred the Jeep site. Fisher's Exact Test indicates that the difference in the preferences of the Germans and Americans between the two shoe websites was not statistically significant ($p=.214$).

Discussion and Conclusion

Review of Findings

The study looked at 24 participants, 12 from Germany and 12 from the US, in hopes of understanding cross-cultural usability as it pertains to personalization of products. The intention was to identify key features in the personalization process from each culture and to see how peoples' usability assessments, in the context of customized products, vary as a function of their country of origin and the origin of the website that they are asked to use. Thereby, we gathered data for evaluations regarding the cultures of the US and Germany. In addition to the qualitative data gathered in interviews, the study had participants complete product customization tasks and a user satisfaction questionnaire, using websites from companies based in the US and Germany.

It was found that visual design is an important factor shaping user experience in both the US and German cultures. Both cultures preferred colors to be either related to the organization / product or to be neutral. Background colors should be muted so as to not detract from content. Visually, designs focusing on the content / product were preferred. It was also found that dark background colors gave a negative experience for the study participants. The Germans, unlike the Americans, had no negative predispositions to the color yellow. There was an indication that Americans favored an interactive experience, in which changes were shown as they were selected.

Navigational design was a second important factor shaping the user experience. The Germans favored an uncomplicated, logical design, in which navigational rules were consistent and there was no confusion. The design should avoid using cookies and asking for personal data as these features were viewed unfavorably by the German participants. The number of steps taken to navigate through the various tasks was not a major influencing factor for the German participants, as long as the navigational design wasn't completely inefficient. On the other hand, the American participants preferred a simple, easy to navigate, fast design. The speed to complete the task was a major factor driving user experience; it was found that page scroll-down features were preferred instead of having to navigate to different pages.

We can see from the data on task performance, post-session interviews and participant preference that each culture related to the three elements of the Hofstede model. The German participants liked structure and order and they didn't care about the number of steps as long as the navigation design wasn't ineffective; they didn't want to feel lost or confused. On the other hand, the Americans stayed true to their fast paced, indulgent characteristics in that they wanted to complete the tasks in the least amount of steps, wanting the process to be quick. This indulgent, short-term orientation aspect of their culture is a key feature to focus on in designing for them.

In studying the qualitative data gathered from participants from each culture, certain features were found to be unique to each group; these are shown in Table 7. The Germans stayed true to their cultural characteristics as described by Hofstede;

order and lack of confusion were major features that were favored by the German participants. The American participants preferred features that helped with speed and ease of use; this too stays true to Hofstede's characterization of the American culture.

Table 7. Features to support cultural differences

	German	American
Personalization Features	<ul style="list-style-type: none"> - Tools to help with structure and flow -Two navigation bars that stay consistent -No overwhelming navigation -Product focus 	<ul style="list-style-type: none"> -Interactive pictures - Check box selection -Updating pictures -Helpful tools that follow you on the page -No scroll on individual components -Next button when needed

Lastly the study shows that there is a relationship between the headquarters location of the organization and participants' usability preferences. The majority of each participant cultural pool chose the website of the organization based in their home culture; this shows that organizations need to work harder to cater to audiences from other cultures, focusing on localizing their designs and information architecture.

Limitations of the Study

A few limitations existed in this study. Participants were tested remotely, which caused a communication barrier, inhibiting the researcher's ability to read the participants' reactions to certain tasks. With this in mind, it was central to keep the testing environment, on the researcher's side, consistent; the researcher wanted to try and create a similar environment for all participants.

Next, it should be noted that the decision to use the Jeep website was taken at the last minute; the website that was originally chosen stopped their customization process in Germany. The choice of Jeep may place limitations on this study, as Jeep may not have the international exposure and experience of the other brands. However, this may in fact explain Jeep's poor scores with the German participants and emphasize the impact of cultural differences.

The study found that Americans spent roughly three times more time on the Internet per day than Germans. This shows that Internet use was culturally significant and a major factor when analyzing the results and preferences stated by the different cultural pools of participants. These findings may have been affected by participants' different understandings of what might be included in 'internet use' and the participants' perceptions of how much they use the internet each day.

Furthermore, although the websites were different for the German and American participants, the study had to treat them as the same when analyzing the data. Doing so allowed the results and preferences from German and American participants to be compared, as if they were using the same exact website.

Further limitations existed with the participants and the biases they brought to the study. This limitation primarily focuses on possible unconscious biases about the Jeep brand for the German participants, rather than the Jeep website. Safeguards were put in place against this limitation by asking a brand question on the pre-session questionnaire and the think-aloud protocols were used to clarify the impact of interface features. The Jeep car that was selected for customization was purposely the smallest car they sell to try to avoid this bias.

As there has been little research conducted in the topic for the study, there was limited data on which to base the research. On the positive side, this study allows for further research in two fields where there is limited information available: personalization and cross-cultural usability of two similar “westernized” cultures. This study provides a base for further studies.

Implications for Future Work

Both from the insights found in the literature review and results of the current study, we can conclude that, although a start has been made in examining the interactions and inter-relationships between cultures and HCI, to date the work has either been broad-based or considered widely varying cultures. To increase our evolving understanding of the inter-dependencies between culture and HCI there is a need to investigate how cultures that are seen as relatively similar in both their cultural and economic standing affect HCI. This may provide some informative insights that may be missed in comparing countries that are at different ends of the cultural spectrum.

With emotion identified as a strong driver in user experience, interactive customization is a feature that will also provide important insights into the topic. In addition, although e-commerce is growing and technology is advancing at record speeds, to date this is an area that has not been investigated. Given its potential to become increasingly significant and the continuing growth in globalization, interactive customization as it relates to culture is worthy of study in its own right.

With the increasing realization of the significance of user experience as a product differentiator and the influence of culture on user experience, the study of

the inter-relationships between culture and HCI is gaining prominence. All in all, an investigation into these relationships in broadly similar cultures using interactive customization should provide further insights into this complex, emerging field of study.

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Appendix 1. Pre-session Questionnaire

1) How old are you?

2) Which country were you born in?

- a. USA
- b. Germany
- c. Other

3) What is your native language?

- a. English
- b. German
- c. Other

4) What is your primary country of residence?

- a. USA
- b. Germany
- c. Other

5) Over your lifetime, how long have you lived outside your primary country of residence?

- a. 0-6 months
- b. 6-12 months

- c. More than 1 year
- 6) How much time do you spend on the Internet per day?
- a. 0-2 Hours
 - b. 3-5 Hours
 - c. 6-8 Hours
 - d. 9 or more hours
- 7) What car brands do you or your family members drive?
- a. Audi
 - b. BMW
 - c. Jeep
 - d. Toyota
 - e. Nissan
 - f. Other
- 8) What shoe brands do you wear?
- a. Asics
 - b. Converse
 - c. Nike
 - d. Puma
 - e. Adidas
 - f. Other

Appendix 2. Mid-session Interview Guide

1) Which website did you prefer?

2) What made you prefer it?

Possible probes:

Brand

Overall experience

Efficiency (didn't take much time)

It was effective (didn't allow me to make errors)

It was fun

The colors

Other

Appendix 3. Post-Task Questionnaire (SUS)

- 1) I think that I would like to use this system frequently (1-5)
- 2) I found the system unnecessarily complex (1-5)
- 3) I thought the system was easy to use (1-5)
- 4) I found the various function in this system were well integrated (1-5)
- 5) I would imagine that must people would learn to use this system very quickly
(1-5)
- 6) I felt very confident using the system (1-5)
- 7) I needed to learn a lot of things before I could get going with this system (1-5)
- 8) How difficult were these tasks on a scale of 1 to 5, with 1 being “not difficult at all” and 5 being “very difficult?”
- 9) How satisfied are you in completing these tasks on a scale of 1 to 5, with 1 being “very unsatisfied” and 5 being “very satisfied?”

Appendix 4. Post-session Interview Guide

1) Which grouping of websites was your favorite?

Possible combinations:

Audi and Adidas

Jeep and Nike

Both sets were the same

Appendix 5. Product Customization Tasks

Audi task

[2016 A4 Sedan (2.0 TFSI) Premium Trim. Eight--speed Tiptronic transmission with Quattro all wheel drive.]

Create an Audi A4 that is Scuba blue metallic in color, has the package, which includes the sport suspension and has heated front seats.

How much does this car cost?

Jeep task

[2016 Jeep Renegade (sport version)]

Create a Solar Yellow Jeep Renegade, with Aluminum wheels and a rear back-up camera.

How much does this car cost?

Nike task

[Nike Shox Turbo VI]

Create a Nike shoe with a team orange base color, tour yellow swoosh color and white shox.

Add them to your cart in mens size 10

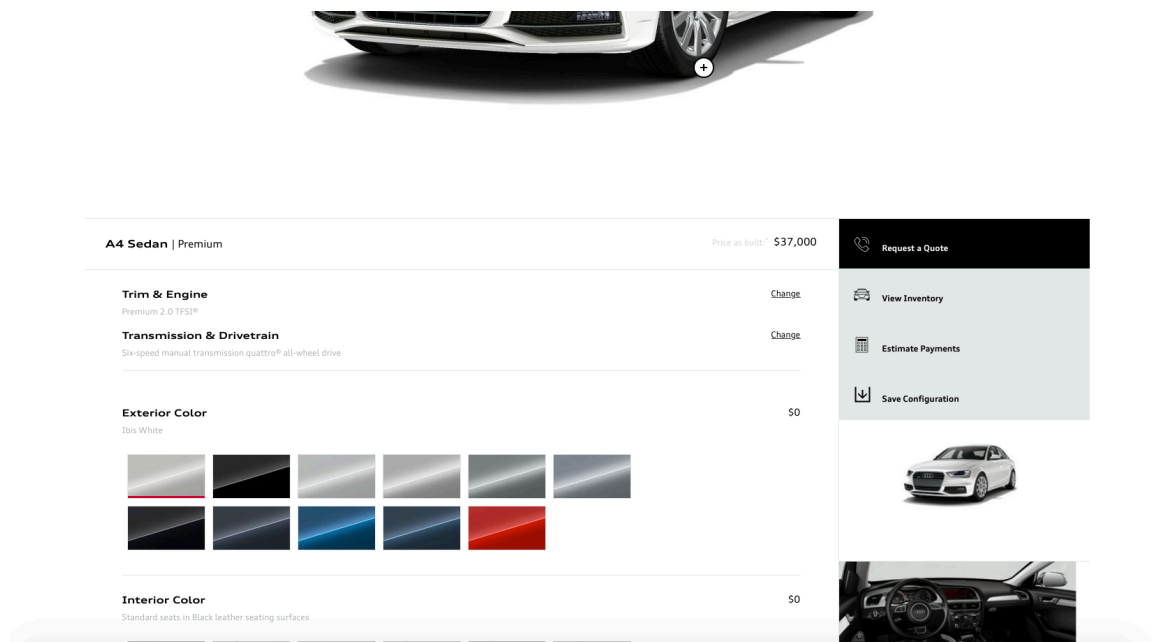
Adidas task

[Mi ZX Flux Weave Classic Shoe]

Create an Adidas shoe with solar gold laces, clear aqua midsole and a solar gold heel cage.

Add them to your cart

Appendix 6. Audi Website



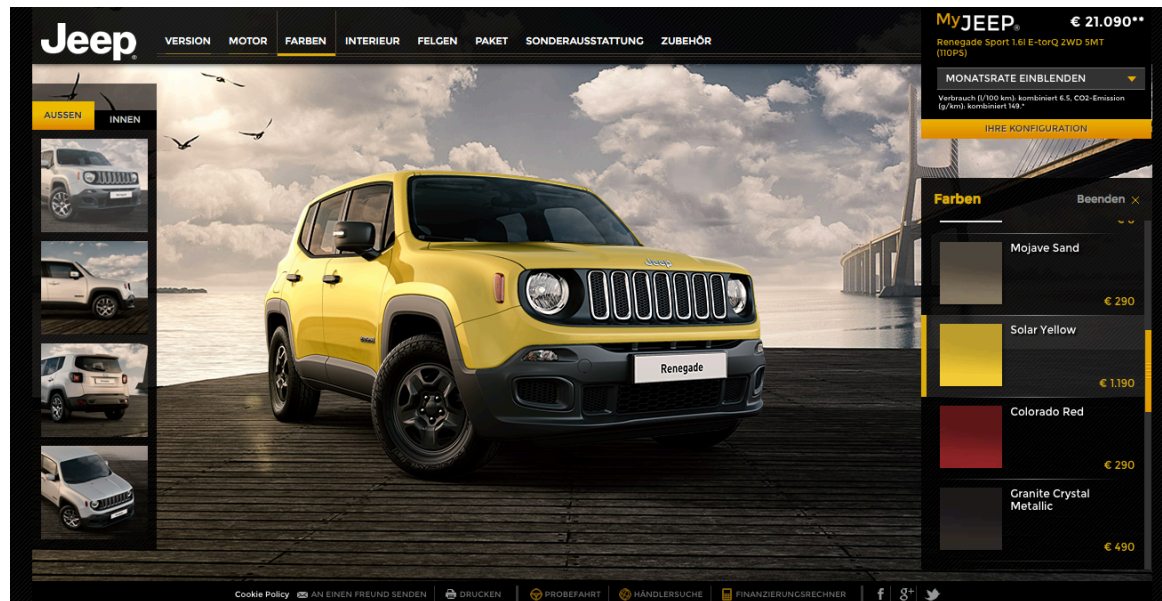
US Version, <https://www.audiusa.com>

Models -> 2017 A4 - > Build

German Version, <http://www.audi.de/de/brand/de.html>

A4 -> A4 Limousine - > Konfiguration starten

Appendix 7. Jeep Website



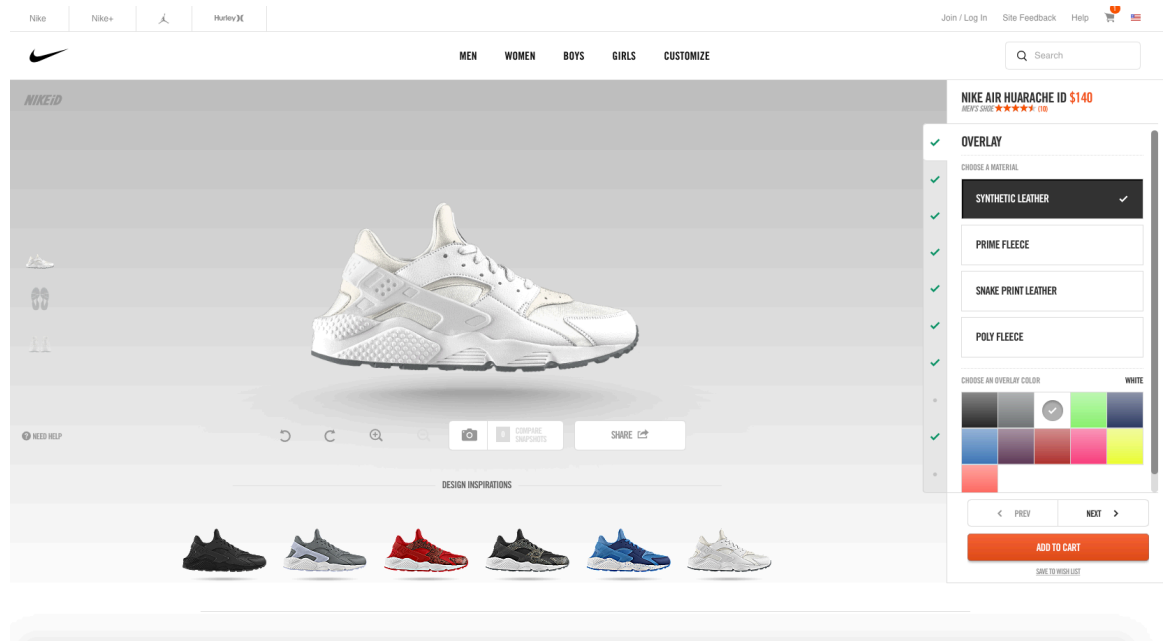
US Version, <http://www.jeep.com/en/>

Vehicles - > 2016 Renegade -> Build & Price

German Version, <http://www.jeep.de>

Konfigurator -> Jeep Renegade -> Konfigurieren

Appendix 8. Nike Website



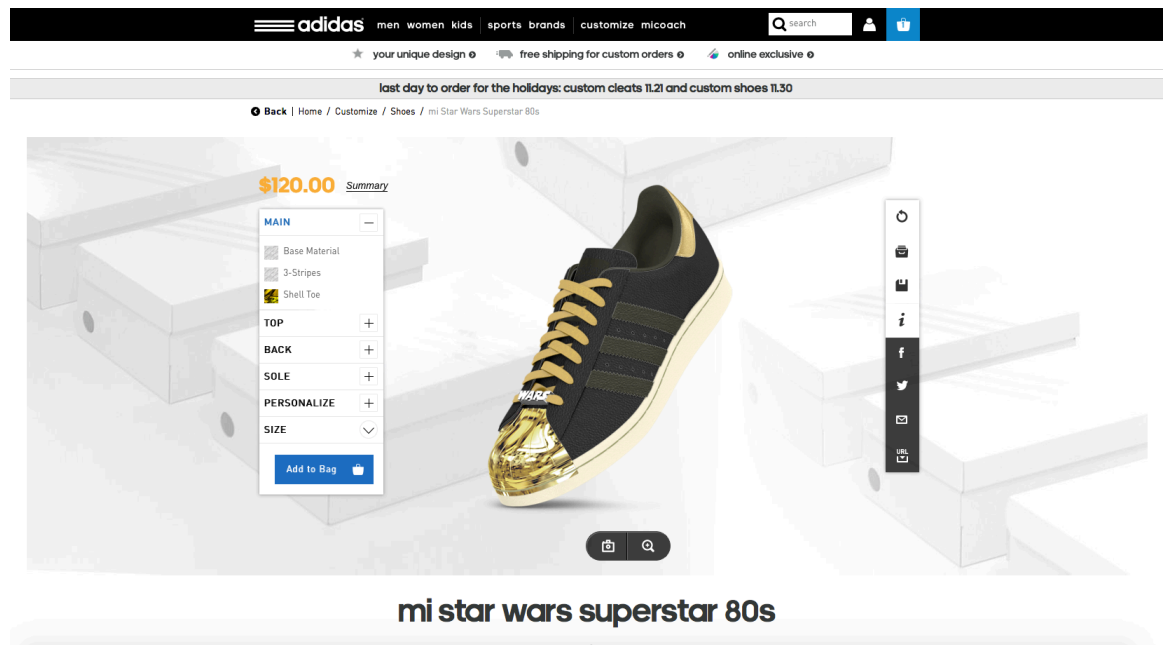
US Version, http://www.nike.com/us/en_us/

Men - > Customize with NIKEiD -> Nike Shox Turbo VI iD

German Version, <http://www.nike.de>

Herren -> Personalisieren mit NIKEiD-> Nike Shox Turbo VI iD

Appendix 9. Adidas Website



US Version, <http://www.adidas.com/us/>

Men -> Customize with mi Adidas -> mi ZX Flux

German Version, <http://www.adidas.de>

Männer -> mach dein eigenes design-> mi ZX Flux

Appendix 10. Ideal/Minimum Steps for Task Completion

	Audi (German)	Audi (American)
Step 1	Scroll	Scroll
Step 2	Scroll	Scroll
Step 3	Click Exterior	Click color
Step 4	Click Color	Scroll
Step 5	Click Sport Package	Scroll
Step 6	Click Interior	Click HeatSeat Package
Step 7	Click Seats	Click SportSus. Package
Step 8	Click Heat Seats	Scroll
Step 9	Scroll	Scroll
Step 10	See Price	See Price

	Jeep (German)	Jeep (American)
Step 1	Accept Cookies	Scroll
Step 2	Select Version	Select Color Option
Step 3	Scroll	Select Color
Step 4	Scroll	Select Add options
Step 5	Click Color	Select Rims
Step 6	Select Rims	Select Interior
Step 7	Click Rims	Select Backup Camera
Step 8	Select Options	Scroll
Step 9	Click Backup Camera	Scroll
Step 10	See Price	See Price

	Nike (German)	Nike (American)
Step 1	Click Color	Click Color
Step 2	Scroll Over	Scroll Over
Step 3	Scroll Over	Scroll Over
Step 4	Select Swoosh	Select Swoosh
Step 5	Click Color	Click Color
Step 6	Select Shox	Select Shox
Step 7	Click Color	Click Color
Step 8	Add to cart	Add to cart
Step 9	Select Size	Select Size

	Adidas (German)	Adidas(American)
Step 1	Select top	Select top
Step 2	Select laces	Select laces
Step 3	Click Color	Click Color
Step 4	Select Sole	Select Sole
Step 5	Select Midsole	Select Midsole
Step 6	Click Color	Click Color
Step 7	Select heel cage	Select heel cage
Step 8	Click Color	Click Color
Step 9	Add to Bag	Add to Bag