

# A Cultural Analysis of the Effect of Room Structure on Product Choice

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## Abstract

**Background** Product choice is not free from the “context of use.” Moreover, the context of use is affected by culture. To further study this concept, this research focused on the relationships among cultural differences, context of use, and product choice associated with air conditioners.

**Methods** Japanese and Korean participants responded to the questionnaire, which showed two spaces (houses)—one Japanese and the other Korean. The respondents were asked to purchase air conditioners for each house with a limited budget, choosing from only two types of air conditioners. Furthermore, they had to mark the location in the house where they would want to install the air conditioners. Subsequent items in the questionnaire also asked the respondents how much they agreed with statements that were related to the design of the air conditioner and its secondary functions.

**Result** The results demonstrate the differences in the choice of air conditioners between the Korean and Japanese respondents. The choices of the Japanese respondents changed in relation to the room structure, whereas the Korean respondents’ choices did not. Moreover, the two groups of respondents differed in their responses to the air conditioner design-related questions.

**Conclusions** The results of this study showed that culture, context of use, and product choice are intertwined. The relationships between product choice and context of use differ according to culture. Furthermore, air conditioners are regarded as a home appliance in Japan, whereas they are considered as furniture in Korea.

**Keywords** Culture, Context of Use, Product Choice

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## 1. Introduction

Users' choice is not free from the context of use (Maguire, 2001; Liu & Li, 2011; Mallat et al, 2009). The results of the experiment conducted by Liu and Li (2011) demonstrated that context of use, such as ease of use, usefulness, perceived enjoyment, and attitude, affected users' perception. Furthermore, Maguire (2001) presented five categories for context of use: user goals and characteristics, tasks, technical environment, physical environment, and social or organizational environment. The experiment revealed that context of use gives product choice a broader concept base.

Among the five types of user contexts that were constructed by Maguire (2011), physical environment relates to space and location. For instance, sites, spaces, and buildings in which users live were regarded as context of use. To be specific, Maguire (2011) explained that "even the location of the product in relation to the user's workplace can magnify the effect of minor problems (p. 460)." Therefore, the space in which a product is used affects the relationship between the product and its users. In other words, the relationship between products and users can change as the spaces in which products are used change.

Moreover, it should be noted that context of use is not free from the influence of culture (Würtz, 2005; Honold, 2000). Honold (2000) reported that the interaction between a product and its users is dependent on the culture in which the users live. In his research, Indian respondents who lived in New Delhi and Mumbai revealed the effect of culture on the relationship between a washing machine and its users. Specifically, the findings of the study showed that a washing machine developed in Germany was not suitable for users in India. For instance, the hot and humid climate of India affects the style of the washing machine needed for the environment. The researcher also showed that most Indians regarded washing as "classic morning work." However, and more importantly, the research revealed that the culture had an effect on user context. Würtz (2005) also illustrated that the interaction between user-customers and product-information differed among cultures. In the study, the culture was divided largely according to "high and low contexts." An analysis of McDonald's websites showed differences among the websites. For example, a McDonald's website that reflects a high-context culture features more animations than a website that reflects a low-context culture. Findings from both pieces of research demonstrated that the relationship between user and product—or information—is dependent on the culture.

Hence, taking its context from prior research, this study focuses on the relationship between culture, context of use, and product choice. To investigate these relationships, this research analyzes the differences in product choices of Japanese and Koreans. Additionally, it hypothesizes that context of use affected the relationship between products and users. Particularly, it assumes that the Japanese and Korean room structures influence their choices of air conditioners.

## 1. 1. Air conditioners in Japanese and Korean markets

This chapter discusses air conditioners that were sold in Japanese and Korean markets. The result of this section are based on the on-line markets in Japan (kakaku.com) and Korea (danawa.com). Before comparing Japanese and Korean products, we decided the criteria for selecting products. First, the most popular air conditioners were chosen for comparison. The products that are consumed more would demonstrate more about the markets. Therefore, we chose popular products. Secondly, products from multiple brands (not a single brand) were chosen. If a common characteristic is found for the products of one brand, the common factor could be caused by brand identity. Therefore, products from various brands were chosen to find out predominant style in each area.

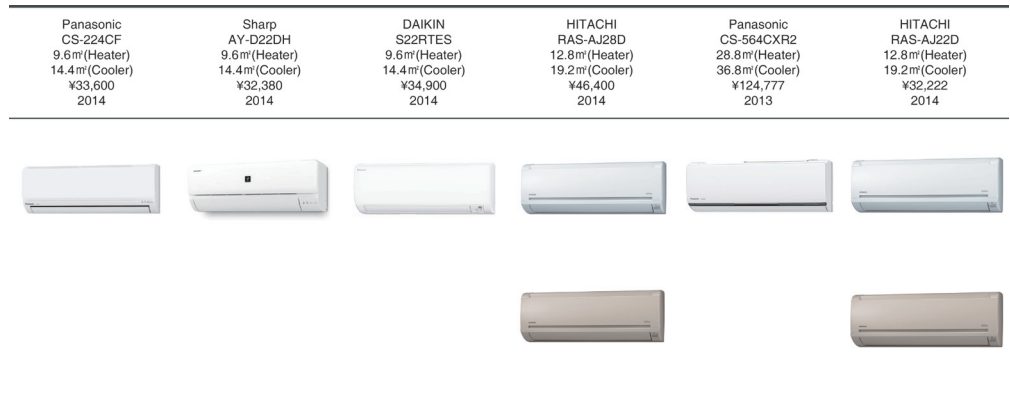


Figure 1 The popular air conditioners in Japan (January, 2015)

Air conditioners in Japan have two common characteristics. Firstly, the Japanese products selected according to the criteria were all wall-mounted air conditioners. This style of air conditioners dominates the Japanese market as of 2015. Regardless of the producers (e.g., DAIKIN, HITACHI, Panasonic), all products were in the wall-mounted style. Additionally, the popular air conditioners in Japan are those that are meant to be use in 15-20m<sup>2</sup>spaces. It is interesting that air conditioners intended for use in 15-20m<sup>2</sup>spaces were sold the most in Japan. (Note that we did not consider the width of spaces as a criterion.)



Figure 2 The popular air conditioners sold in Korea (January, 2015)

With regard to the popular products in Korean market, six air conditioners produced by Samsung and LG were chosen. Compared to those in Japanese market, floor-standing air conditioners were consumed the most in the Korean markets. In most cases, the products of this type are taller and are used in a larger space compared to the wall-mounted air conditioners. The average height of four popular Korean air conditioners in the floor-standing style is about 1900mm. Moreover, air conditioners that can be used in 15-20mm<sup>2</sup> spaces (generally in the wall-mounted style) as well as those that can be used in 40-50mm<sup>2</sup> spaces (mostly in the floor-standing style) were popular.

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## 2. Method

### 2. 1. Hypotheses

To investigate the differences in the product choices between Japanese and Korean, a questionnaire associated with air conditioners was designed. As shown in Chapter I, results of prior research demonstrate that the relationship between products and users differ by culture (Würtz, 2005; Honold, 2000). Based on these results, the following hypothesis is stipulated.

H1: The Japanese respondents' choice of air conditioner is different from the choice of the Korean respondents.

Furthermore, as shown in the last chapter, the context of use affected the relationship between products and users. In other words, it (e.g., space where a product is used) affected the choices of users. Based on the result, this study hypothesizes that the different room structures in Japan and Korea influence the choices of air conditioners. Accordingly, the following hypothesis is formulated.

H2: The different room structures in Japan and Korea influence the choices of air conditioners.

Hypothesis 2 indicates that room structures affect the choice of air conditioners. This hypothesis is also explained by the following question: When the common room structures in Korea and Japan are offered to the people in Japan, which air conditioner would they prefer? If their choice changed according to the room structure, it would mean that the room structure affects the choice of air conditioners.

Moreover, this study assumes that cultural differences lead to differences in design and function sensitivity for the product. Specifically, this study stipulates that design and function sensitivity differ by culture. Accordingly, the following hypothesis is stipulated.

H3: The design and function sensitivity of air conditioners reflect the differences between Koreans and Japanese.

## 2. 2. Pretest: differences in room structures between Japan and Korea

Before validating Hypothesis 2, the different room structures in the two areas should first be verified. For this, the drawings of floor plans in Japan and Korea were collected. To ensure that the drawings were selected without bias, specific criteria for selection were identified.

### Criteria

- (1) The 60 sq.m.–70 sq.m. space has three rooms.
- (2) Most of the spaces are consumed in large amounts compared to a house (e.g., an apartment). This criterion is based on the assumption that a space or house designed by an owner reflects the owner's preference and lifestyle better than an apartment. Therefore, common room structures may be found more in the case of apartments.
- (3) The particular space was constructed after year 2000.

Using these criteria, we selected 20 drawings each from Tokyo and Seoul. The results show the difference in the room structures in Japan and Korea, as follows.

### In Japan:

The 60 sq.m.–70 sq.m. houses have a corridor that is connected to the entrance. The living room and kitchen are located at the end of this corridor. There are three rooms along the corridor.

### In Korea:

The entrance is directly connected to the living room without a corridor. Three rooms are located around the living room.

## 2. 3. Questionnaire

In the questionnaire (in both Japanese and Korean versions), two spaces were shown to the participants. Three questions were associated with each space.



Figure 3 Spaces that were shown to the participants

First, the blueprint of a 60 sq.m. house in Japan was presented to them. Subsequently, the participants were asked to purchase air conditioners for the house with a limited budget (budget in Japanese questionnaire = JPY150,000; budget in Korean questionnaire = KRW1,500,000). For this question, the participants had to choose from two types of air conditioners—floor-standing style product (usable area: 50 sq.m.; price: KRW1,000,000/JPY100,000) a wall-mounted style product (usable area: 25 sq.m.; price: KRW500,000/JPY50,000). The price and the usable area were based on the result of the first chapter (chapter 1.1). After choosing the air conditioners, the participants were asked to put stickers on the location in the house where they would want to install the air conditioners. Blue stickers were used for the floor-standing air conditioner, and red stickers were used for the wall-mounted air conditioner. Furthermore, the participants were asked to provide the reason for their choice. All these questions were repeated on the next page in the context of a 60 sq.m. house in Korea.

Subsequently, in order to validate Hypothesis 3, we designed six items. The items were presented to the participants in a shuffled order and were designed in order to evaluate the participants' design and function sensitivity. All items used 7-point scales. The value of the Cronbach's alpha demonstrates that these items can be divided into two categories. The three statements related to design sensitivity were highly correlated (Cronbach's alpha = .868). The other three questions related to the function of air conditioners were also highly correlated (Cronbach's alpha = .902).

Q1. Sensitivity to design of air conditioners (Cronbach's alpha = .868)

Q1.1. The shape of an air conditioner is as important as its function.

Q1.2. When choosing an air conditioner, I consider its harmony with the interior of my house.

Q1.3. (In some sense), an air conditioner is more like a piece of furniture.

Q2. Sensitivity to function of air conditioners (Cronbach's alpha = .902)

Q2.1. Secondary functions are necessary for an air conditioner.

Q2.2. When choosing an air conditioner, I consider its secondary functions.

Q2.3. There are some secondary functions that an air conditioner must have.

A total of 39 Japanese students from Chiba University (males: 25; females: 14) and 36 Korean students from Yonsei University (males: 22; females: 14) responded to the questionnaire (total respondents: 75).

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## 3. Results

### 3. 1. Differences in product choices of Japanese and Korean participants

With regard to Hypothesis 1, the results demonstrate the difference in the choices of Korean and Japanese participants ( $\chi^2 = 25.58$ ;  $df = 4$ ,  $p < .00$ ; Table 1). For a 60 sq. m. house in Japan, most of the Japanese participants chose to purchase three wall-mounted air conditioners (Japanese: WallMnt3 = 31; 79.5%).

However, for the same question, only 27.8% of the Korean participants chose to purchase three wall-mounted air conditioners (Korea: WallMnt3 = 10; 27.8%). Most of the Korean participants chose to purchase one floor-standing product and one wall-mounted product (Korean: S1+WallMnt = 23; 63.9%). In contrast, only 12.8% of the Japanese participants chose this option (Japanese: S1+WallMnt = 5; 12.8%).

**Table 1** Culture-choice crosstabulation for a 60 sq.m. house in Japan

Note. WallMnt and WMnt indicate wall-mounted air conditioners, while Stand indicates floor-standing air conditioners. Percentages are rounded off to the nearest hundredth.

			Choice					Total
			WallMnt 1	WallMnt 2	WallMnt 3	Stand 1	Stand1+ WMnt1	
Culture	Japanese	Count	2	1	31	0	5	39
		%	5.1%	2.6%	79.5%	0.0%	12.8%	100%
	Korean	Count	1	0	10	2	23	36
		%	2.8%	0.0%	27.8%	5.6%	63.9%	100%
Total		Count	3	1	41	2	28	75
		%	4.0%	1.3%	54.7%	2.7%	37.3%	100%

Moreover, a difference in choice was noted in the case of the 60 sq.m. house in Korea ( $\chi^2 = 16.95$ ;  $df = 4$ ,  $p < .00$ ; Table 2). Most of the Japanese participants chose to install three wall-mounted air conditioners (Japanese: WallMnt3 = 22; 56.4%). However, only 22% of the Korean participants chose this option (Korea: WallMnt3 = 8; 22.2%). Most of the Korean participants chose to install one floor-standing product and one wall-mounted product (Korean: S1+WallMnt1 = 22; 61.1%). Interestingly, more than 30% of the Japanese participants chose this option (Japanese: S1+WallMnt1 = 12; 30.8%).

**Table 2** Culture-choice crosstabulation for a 60 sq.m. house in Korea

			Choice					Total
			WallMnt 1	WallMnt 2	WallMnt 3	Stand 1	Stand1+ WMnt1	
Culture	Japanese	Count	0	4	22	1	12	39
		%	0.0%	10.3%	56.4%	2.6%	30.8%	100%
	Korean	Count	0	0	8	6	22	36
		%	0.0%	0.0%	22.2%	16.7%	61.1%	100%
Total		Count	0	4	30	7	34	75
		%	0.0%	5.3%	40.0%	9.3%	45.3%	100%

These results validate Hypothesis 1. The participants from Korea and Japan displayed the following tendencies:

- (1) Korean participants preferred one floor-standing air conditioner and one wall-mounted air conditioner.
- (2) Japanese participants preferred three wall-mounted air conditioners.

### 3. 2. Differences in room structures and differences in preferences for air conditioners

In this section, we demonstrate that Hypothesis 2 is plausible. In other words, the preference of Japanese participants changed with a change in the room structure ( $\chi^2 = 9.211$ ;  $df = 4$ ,  $p < .10$ ; Table 3). For the 60 sq.m. house in Japan, most of the Japanese participants preferred to install three wall-mounted air conditioners (Japanese space: WallMnt3 = 31; 79.5%). Only 12.8% of the Japanese participants chose to install both kinds of air conditioners (Japanese space: S1+WallMnt1 = 5; 12.8%).

Table 3 Choices of Japanese participants

		Choice					Total	
		WallMnt 1	WallMnt 2	WallMnt 3	Stand 1	Stand1+ WMnt1		
Culture	Japanese	Count	2	1	31	0	5	39
		%	5.1%	2.6%	79.5%	0.0%	12.8%	
	Korean	Count	0	4	22	1	12	39
		%	0.0%	10.3%	56.4%	2.6%	30.8%	
Total		Count	2	5	53	1	17	78
		%	2.6%	6.4%	67.9%	1.3%	21.8%	

However, for the 60 sq.m. house in Korea, 30.8% of the Japanese participants chose to purchase one floor-standing air conditioner and one wall-mounted air conditioner. Moreover, the number of Japanese participants who chose to buy three wall-mounted air conditioners decreased (Japanese space = 31, 79.5%; Korean space = 22; 56.4%).

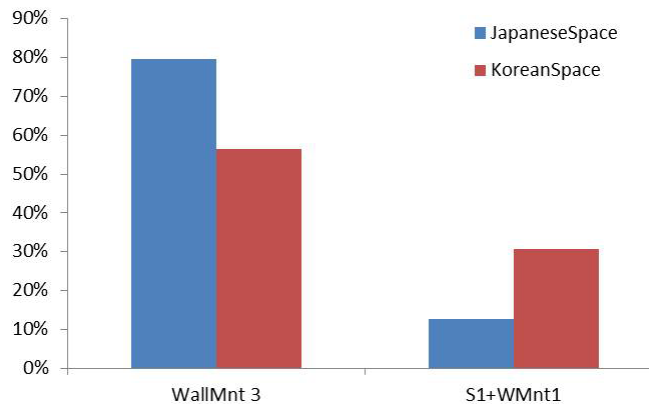


Figure 4 Changes in Japanese participants' choices

Results of the chi-square test show that the difference in room structure did not affect the choice of the Korean participants ( $\chi^2 = 4.33$ ;  $df = 3$ ; ns). Most of the Korean participants preferred a combination of two kinds of air conditioners (Japanese space: S1+WallMnt1 = 23, 63.9%; Korean space: S1+WallMnt1 = 22, 61.1%). However, we found that the preference of the Korean participants changed slightly with the change in room structure. For the house in Japan, 27.8% of the Korean participants chose to buy three wall-mounted air conditioners (Japanese space: WallMnt3 = 10; 27.8%). In contrast, 22.2% of the Korean participants chose this option for the house in Korea (Korean space: WallMnt3 = 8; 22.2%).



### 3. 3. Differences in design sensitivity

With regard to Hypothesis 3, only design sensitivity showed a difference between Koreans and Japanese (Table 4). The mean score of the three design-related questions was calculated as the “design-sensitivity score.” Interestingly, the design-sensitivity score showed a difference between the two parties. The results of the t-test showed that the Korean participants were more sensitive to the design of the product ( $M_{\text{Korean}} = 5.17$ ,  $M_{\text{Japanese}} = 3.38$ ;  $t(73) = 5.64$ ,  $p < .00$ ).

Table 4 Sensitivity to design of air conditioners

Question	Group	Mean	SD	t	p
1.1	Japanese	3.31	1.56	6.42	.000
	Korean	5.47	1.34		
1.2	Japanese	4.00	1.80	5.01	.000
	Korean	5.78	1.17		
1.3	Japanese	2.64	1.55	4.27	.000
	Korean	4.25	1.71		

Furthermore, the Korean participants agreed even more with question 1.3 (“In some sense, an air conditioner is more like a piece of furniture”) compared to their Japanese counterparts ( $M_{\text{Korean}} = 4.25$ ,  $M_{\text{Japanese}} = 2.64$ ,  $t(73) = 4.27$ ,  $p < .00$ ).

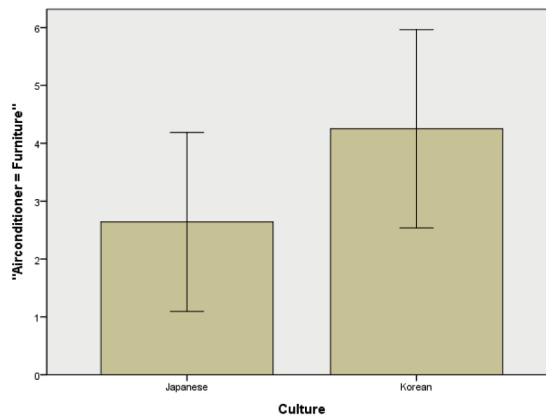


Figure 5 The degree to which participants agreed with the statement “In some sense, an air conditioner is more like a piece of furniture.”

As with design sensitivity, we calculated the score of function sensitivity. The mean score of the three function-sensitivity questions was calculated. The function sensitivity score does not reveal any difference between the Korean and Japanese participants ( $M_{\text{Korean}} = 4.31$ ,  $M_{\text{Japanese}} = 4.74$ ;  $t(73) = 1.74$ , ns).

Of the questions related to the participants’ sensitivity to the function of air conditioners, the responses to only one question, Q2.2 indicated a difference between the choice of the Korean and Japanese participants. ( $M_{\text{Korean}} = 4.33$ ,  $M_{\text{Japanese}} = 5.10$ ,  $t(73) = 2.41$ ,  $p < .05$ ).

## 4. Discussion

This study explains the differences between product choices of Koreans and Japanese. The results showed that the choice of the Japanese participants was different from that of the Korean participants.

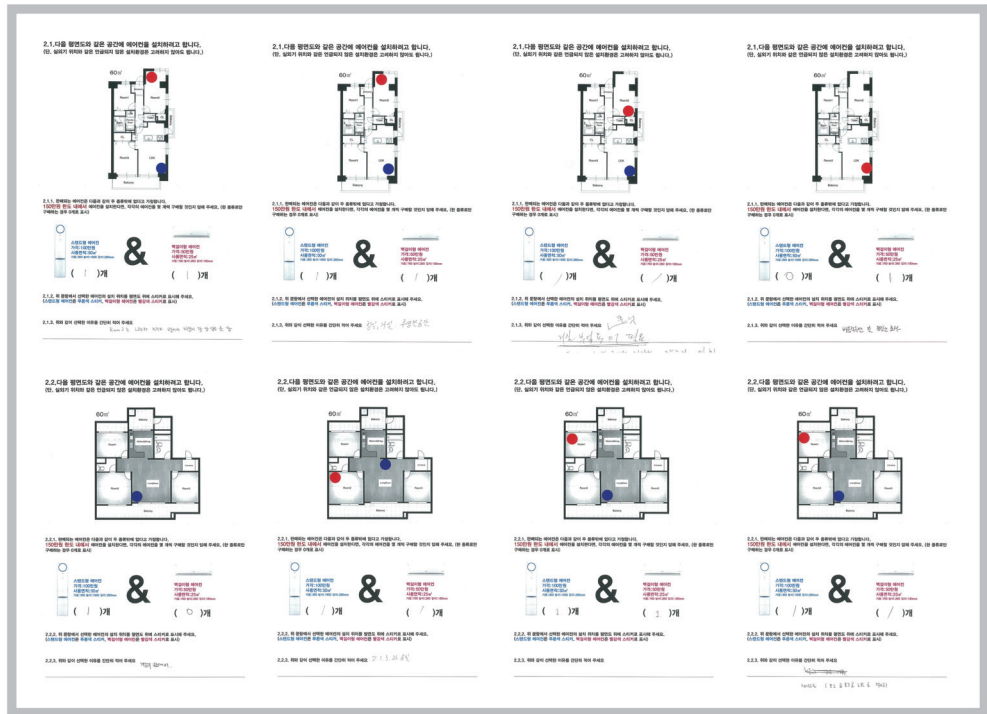


Figure 6 Examples of Korean participants' choices

Based on their responses to the questionnaire, the Korean participants preferred one floor-standing air conditioner and one wall-mounted air conditioner, while the Japanese participants preferred three wall-mounted air conditioners.

Furthermore, the results of this study demonstrated that there is an interaction between culture, context of use, and product choice. Room structure is a variable that caused differences only in the choices of the Japanese participants. The Japanese considered the room structure vital in making their choices. In other words, they gave more consideration to the relationship between room structure and the type of air conditioners compared to the Korean participants. Of course, the change in the Japanese participants' choice does not mean that they are more "rational" than the Korean participants. However, the results suggest that they valued the relationship between space and product more than the Korean participants. Nevertheless, there might be other variables—for example, market condition or buying experience—that can cause the differences in product choices of Japanese and Korean participants. Therefore, further research is needed to shed light on the other variables that might have an impact on the product choices.

With regard to the design of the air conditioner, the results reveal that Korean consumers value the design or shape of air conditioners. In the questionnaire, the Korean participants showed stronger design sensitivity than their Japanese counterparts.

Furthermore, the results show that cognition of a product differs according to culture. The cultural difference was evident in the participants' responses to this statement: "(In some sense), an air conditioner is more like a piece of furniture." This finding means that the Korean participants viewed air conditioners in a different way than the Japanese participants.

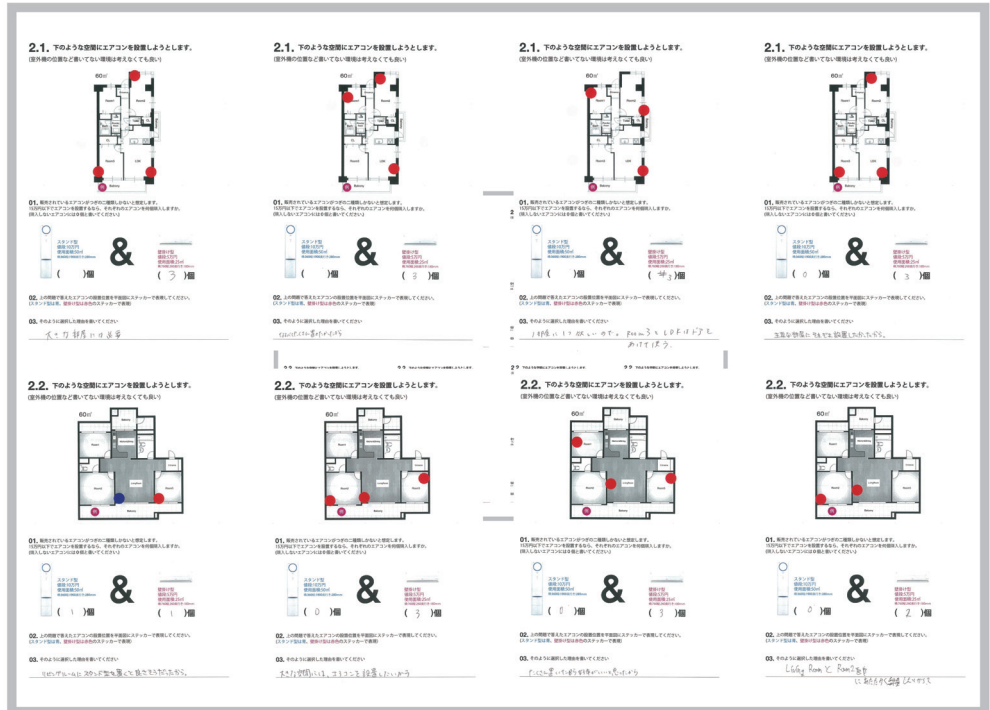


Figure 7 Examples of Japanese participants' choices

## 5. Conclusion

This study showed how culture impacts product choice. The Japanese participants' choices regarding air conditioners were different from those of their South Korean counterparts. Furthermore, the results showed that there is an interaction between product choice and context of use. Specifically, the product choices of the Japanese participants were related to the context of use more strongly than the product choices of the Korean participants. The Japanese participants' choices differed depending on the kind of space they were asked to consider when choosing an air conditioner. When asked to consider a 60 sq.m. house in Japan, they chose to install two or three wall-mounted air conditioners. However, when they were asked to consider a 60 sq.m. house in South Korea, several Japanese participants opted for floor-standing air conditioners, while many others preferred to install two or three wall-

mounted air conditioners.

The results demonstrate that the Japanese and South Korean participants had different ideas about air conditioners. More South Koreans participants than Japanese participants regarded air conditioners as a piece of furniture.

To summarize, this study shows that culture, context of use, and product choice are intertwined. It indicates that the relationships between product choice and context of use differ according to culture. Moreover, the result shows that cognition of a product differs according to culture.

### References

- 1 Honold, P. (2000). Culture and context: An empirical study for the development of a framework for the elicitation of cultural influence in product usage. *International Journal of Human-Computer Interaction*, 12(3-4), 327-345.
- 2 Liu, Y., & Li, H. (2011). Exploring the impact of use context on mobile hedonic services adoption: An empirical study on mobile gaming in China. *Computers in Human Behavior*, 27(2), 890-898.
- 3 Maguire, M. (2001). Context of use within usability activities. *International Journal of Human-Computer Studies*, 55(4), 453-483.
- 4 Mallat, N., Rossi, M., Tuunainen, V. K., & Öörni, A. (2009). The impact of use context on mobile services acceptance: The case of mobile ticketing. *Information & management*, 46(3), 190-195.
- 5 Würtz, E. (2005). A cross-cultural analysis of websites from high-context cultures and low-context cultures. *Journal of Computer-Mediated Communication*, 11(1), article-13.

