Comparison of influence of Thai and Japanese cultures on reasoning in social communication using simulated crowds

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ABSTRACT
Difficulties living in unfamiliar cultures are caused by differences in patterns of thinking, points of view, and physical action styles. Learning to understand these different styles is one solution that may help people to live together with their differences. This paper presents our findings on learners’ cultural understanding during interaction based on culturally influenced communication in simulated crowds. Japanese and Thai participants were asked to obtain multiple tickets available at two service counters, A and B, in a shared virtual space, where a service person provided a ticket upon request. Virtual customers moved around in the system to acquire tickets and, if a counter was occupied by a customer, other customers had to wait. Two types of waiting styles (line and group) and two service person fairness levels (fair and unfair) were configured and the reactions of participants evaluated. Furthermore, the counter selection results and selection reasoning results were analysed using the ANOVA process. The results showed that culture influences ideas of waiting differently between Japanese and Thai participants: Japanese participants focused on the benefits of waiting, such as waiting speed, whereas Thai participants focused on the reaction or response of the service person to customers.

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Introduction
The world seems smaller today than in the past, as travelling to different parts of the world is faster and easier. When a traveller first arrives in a foreign country, such as when an American travels to an Asian country or an Asian student goes to study in a European country, they may encounter many aspects that differ from their hometown, such as language, food, the way of thinking, and daily life. Learning to understand people from other cultures is necessary for those who are exposed to different cultures (Samovar, Porter, McDaniel, & Roy, 2016).

Dresser (2011) provides an example: an American makes the mistake, on first greeting an Asian (such as a Vietnamese), of hugging and kissing in public, thereby insulting her. Even though hugs and kisses are common greeting behaviours in Western culture, it is
considered rude in Asian culture. It is very easy to learn and avoid this mistake by reading a book or watching a video of examples of greetings in different cultures. However, there are more complex communication and interaction patterns abound when we travel in the real world. A simple activity that a tourist cannot avoid is waiting in queues. Waiting is related to the idea of fairness (Maister, 1984; Rafaeli, Barron, & Haber, 2002). Although fairness is a simple term, its meaning is deepened by many factors, including culture. Therefore, this study investigated the intricacies of cultural influence on waiting behaviour.

Intercultural tourism is superficial (Hofstede, Hofstede, & Minkov, 2010) because travelers experience other cultures/countries for a short time. Although they might not understand complex situations, they should at least learn appropriate behaviour to be able to avoid misunderstandings and miscommunication. Hofstede et al. (2010) stated that the intercultural communication learning process comprises three phases: awareness, knowledge, and skill. Awareness enables learners to notice different or strange signals in an environment and recognize the differences to their own cultural background. Knowledge is obtained by establishing the meaning of the behaviour in the new culture and updating their own knowledge. By practicing being aware and updating knowledge, they will gain the skill of awareness and the knowledge to understand the situation and behaviour in the new cultural place.

Cultural difference is difficult to understand because recognizing (Awareness) the different particular mental software between two cultures involves a complex process of getting an intellectual grasp of that different culture, updating one’s knowledge, and practicing a communication skill (Hofstede et al., 2010). Currently, computer simulation offers a suitable solution for helping people learn to overcome the communication difficulty in different cultures. We cannot set up a real human crowd to practice communication, but we can simulate the agent and environment as a learning system to train people before they travel to different cultural places. Crowded places are simple and suitable places to practice cultural communication because we can easily identify similar behaviours among a large number of people.

This paper presents the initial state of this research; herein, we select an international traveller as a case study of misunderstandings in cultural communication with the objective of capturing the perception of activities through the cultural filter. Here, we compare and contrast the results obtained in a previous study (Thovuttitkul, Ohmoto, & Nishida, 2018) as regards Thai culture’s influence on waiting behaviour with new results from an additional experiment involving Japanese participants in this study.

In the next section, we discuss related work on cultural behaviour learning and cultural dimension theories. Then, we describe our hypothesis, experiment concept, and a solution to confirm our hypothesis. Subsequently, we present our experimental setting in both countries and a concrete result. The experimental results are presented as evidence of our findings. Finally, we summarize our findings and present our future plans based on these results, towards fulfilling the main goal of developing a cultural assistance learning system.

**Related work**

The study of cultural communication has gained popularity over the last decade and many researchers have developed virtual simulation systems to represent different cultural behaviours and communication. These systems are designed to provide learners with
an understanding of different cultural behaviours through complex models of a virtual agent’s behaviour (Degens, Endrass, Hofstede, Beulens, & André, 2014; Endrass et al., 2011; Hall et al., 2015; Kistler, Endrass, Damian, Dang, & André, 2012; Mascarenhas et al., 2013), useful scenarios (Endrass et al., 2011; Hall et al., 2015; Kistler et al., 2012; Mascarenhas et al., 2013), or powerful interactive tools (Kistler et al., 2012; Mascarenhas et al., 2013). The learners observe the situation from a third-person point of view (POV), just as they are looking at other behaviours as examples (Degens et al., 2014; Hall et al., 2015; Kistler et al., 2012), and then they are asked to interact with the agent first-person POV (Hall et al., 2015; Mascarenhas et al., 2013) same as in the real world. By these steps, the participants gain a cultural observation process in third-person POV and an interaction experience with a cultural agent in first-person POV. They are able to attend to acquire cultural lessons in observation and interaction by different types of POVs but cannot fully recognize or understand the cultural knowledge from this process.

The aim of this research is to develop a solution that helps people to learn to communicate appropriately in different cultural conditions. We focus first on the awareness process as the starting point. In this first stage of the research, we emphasize the awareness process of cultural differences and conduct experiments that provide us with a solution that increases the awareness of cultural differences. Different POVs – first- and third-POVs – constitute one solution to help a participant realize and recognize the different values of cultural differences in this study.

Space usage is one important dimension in cultural communication differences. Hall and Hall (1989) discussed territoriality and personal space – a simple concept that cannot be seen as a physical boundary. There is an invisible bubble around each person that depends on a number of factors: relationships with nearby people, emotion, activities, and culture. For example, people allow friends or family to stay closer than others who are strangers. Culture is an important factor in controlling personal space. Our goal is to establish the influence of culture on perception. We set two different POVs, first- and third-person, of two participant groups, in order to examine the effect of cultural influence on each POV.

Queue-waiting is a good practical case for studying cultural communication because it involves cultural influence and cultural space handling. The waiting position, waiting queue shape, and waiting process are important factors in the pleasantness of waiting (Maister, 1984; Rafaeli et al., 2002). As mentioned above, the space used is culturally influenced (Degens et al., 2014). People have different ways of managing their own space. In practice, Japanese people strictly form queues virtually everywhere they have to wait for service. In contrast, Thai people form queues only in formal places such as banks, hospitals, and libraries whereas in informal places that do not have strict rules to control queue-waiting, they do not form a queue. Travellers (such as Japanese) belonging to another culture (for example Thai culture) may have many questions regarding waiting practices in Thailand. How does the service person know who is next? Is the service person fair or not? Such confusion may arise when a traveller with a certain cultural background travels to another culture.

Hofstede et al.’s (2010) cultural dimension is used to categorize thinking, belief, and behaviour for more than 40 countries. Six dimensions of national culture are defined based on an aspect of each culture when measured relative to other cultures. The dimensions are as follows: (1) power distance, (2) individualism versus collectivism, (3)
masculinity versus femininity, (4) uncertainty avoidance, (5) long-term versus short-term orientation, and (6) indulgence versus restraint. We only discuss two dimensions that are relevant to our experiments.

**Dimension 2**, Individualism (IDV) vs. collectivism (COL): This dimension represents the difference between people. Collectivist cultures feel and identify others as in-group or out-group, whereas individualist cultures feel that there is no group; everyone is unique (Japan 46, Thai 20). (This dimension is referred to as ‘IDV’ in this document.)

**Dimension 3**, Masculinity (MAS) vs. femininity (FEM) or achievement-oriented versus cooperation-oriented: This dimension describes how gender influences roles. In high-femininity cultures, both genders are assumed to be cooperation-oriented (Japan 95, Thai 34). (This dimension is referred to as ‘MAS’ in this document.)

In this study, a scenario of different waiting styles was designed based on these cultural dimensions and the participants’ reactions during interaction analysed to measure the different cultural background effects of their perception and interpretation related to our scenario.

**Environment used to observe the communication human behaviour in crowds**

In our previous research, a ‘simulated crowd’ (Lala, Thovuttikul, & Nishida, 2011; Thovuttikul et al., 2011, 2012) was introduced as a framework for a cultural learning assistant system. The framework consists of an agent and an environment for practicing cultural communication in human crowds. In this study, we identified the learner’s cultural background factors that affect the participant learning process. Culture plays an important role in the communication process. The space used is meaningful in crowd communication (Hall, 1989) and depends on culture (Hall, 1989). We would like to apply different POV methods in our system to increase the interpretation of the space used (for example, distance, position, and direction) and cultural background influence. The details of a different POV method were presented in a study of the Synthetic Evidential Study (SES) framework (Nishida et al., 2015a, 2015b; Ookaki, Abe, Yoshino, Ohmoto, & Nishida, 2015). In the SES framework, first, the participant experiences a scenario from the first-person view of one character. Subsequently, that participant repeatedly experiences the same scenario from another character’s POV (another role player in the same story). By this process, the participant is able to see their own interaction and communication in the third-person view. The results showed that this enabled the participant to interpret the situation from a variety of directions, such as reasoning-based, feelings-based, and facts-based, in that story. The different POV methodology is helpful for participants to deeply understand the story by bringing together partial thoughts and evidence.

In our research, we focus on learning different forms of cultural communication. In essence, the participant interacts and communicates in the first-person view. Following basic steps, the participant observes the cultural lesson through their cultural background as if they were there in the real world. In this study, we apply the different POV concept to learning different forms of cultural communication because we believe that different POVs help the participant to interpret the cultural situation more deeply than only one POV. For example, observation from a third-person POV results in more information such as 360° views of position, distance, and environment. The participant is able to acquire more
factors and reasoning for decision-making. When the participant is able to interpret a variety of reasons or factors for a cultural situation, they will learn about different forms of cultural communication more clearly. Therefore, we first hypothesized that first and third-person POVs may yield different perceptions based on cultural background. In this study, we explored the different benefits for cultural learning of different POVs.

**Influence of culture on perception**

To learn culture-dependent behaviour for communication, the participant should be aware of the differences to be considered in learning a new culture (Hofstede et al., 2010). In previous works, most researchers conducted experiments by providing different behaviours for participants from two or more cultures (Degens et al., 2014; Endrass et al., 2011; Hall et al., 2015; Kistler et al., 2012; Mascarenhas et al., 2013). Research and studies on cultural differences (Degens et al., 2014; Endrass et al., 2011; Hall et al., 2015; Kistler et al., 2012; Mascarenhas et al., 2013) use Hofstede cultural dimension to design the behaviours for the agent or the communication style in the scenarios. The participants are first asked to observe the scenario, and then to verify their satisfaction about that behaviour. The results show that participants are able to observe the differences between each cultural dimension’s behaviours. In those scenarios, the focus is on the agent’s behaviour model being well designed. In contrast, in this research, our objective is to develop a system for learning different cultures. Thus, a system based solely on a well-designed agent behaviour model is not sufficient. In general, participants will observe and interpret situations through their cultural background. The different POV method is important to help learners interpret and understand the variety of meanings or reasonings associated with a situation (Nishida et al., 2015a, 2015b; Ookaki et al., 2015). The POV method was therefore used to increase awareness in the culture learning process.

In this study, we identified the cultural factors that influence perception in the different cultural communications learning process. We developed a virtual simulation system that allows the agent to present examples of nonverbal communication, such as hand gestures, standing distance, and body direction. The participant could then learn that behaviour and practice to react with our agent and avatar to find the result of their reaction in our system.

Waiting behaviour was used as a cultural communication activity to analyse cultural influence in this study. We selected two dimensions that are relevant to waiting behaviour for use in our experiments.

**Dimension 2: ‘Individualism vs. collectivism’;**

**Individualist culture:** Waiting is instrumental. Universalistic logic: Everyone has equal rights in waiting activities.

**Collectivist culture:** Waiting behaviour is a social activity. Groups are formed based on relationships, such as family, friends or other salient social functions.

**Dimension 3: ‘Masculinity vs. femininity’;**

**Masculine culture:** The competitive is the solution for communication.

**Feminine culture:** There is not much force or urgency. People relax and enjoy the waiting time.

We used these two dimensions to describe the characteristics of waiting style in Japan and Thailand. As stated in the ‘Related work’ section, Thai people usually do not form lines.
when waiting in informal situations, whereas Japanese people tend to form lines in virtually any situation where they have to wait for service. Our experiment was designed based on the real-world situation and related to the cultural dimension of Hofstede. Two waiting styles were designed: group waiting style (waiting in a random position) and line waiting style. People from Thai and Japanese cultures interpret waiting differently. Thai culture is collectivist and feminine (IDV = 46, MAS = 95): Thai people are relaxed, unhurried, and enjoy waiting time because waiting is a social activity. Thus, group waiting style is suitable to represent the waiting style in Thai culture because people can talk socially – have group discussions about consumer goods, prices, news, and weather. On the other hand, Japanese culture is individualist and masculine (IDV = 20, MAS = 34): The people are competitive and employ an equal right solution. Thus, they tend to have a concrete rule for waiting situations such as a line or an orderly system. Consequently, we design line waiting to represent the waiting style of the Japanese culture. Another factor is the response of the service person to jumper-customers – the service person may accept or reject the ticket request from a jumper-customer who is his friend. Accepting a request represent a privilege from the friend relationship that is related to collectivism and femininity culture. In contrast, the rejecting response causes a concept of equal right that is related to Individual and masculine culture.

In terms of communication, perception is a cognitive process by which people come to interpret and understand other people, events and objects (Jandt, 2017). People perceive the world differently and we can understand the different behaviour of other people by learning how their perception operates. Learning perceptual processes helps us to understand the meaning of behaviour and improve communication. In general, if a learner sees that the properties of choices are obviously different, they will easily select the better choice by sense of sight. In contrast, if the main properties of these choices are similar, then they more carefully consider the features based on their own priorities. Thus, our second hypothesis is that culture influences how people make a choice or simply ignore a situation. To describe this hypothesis, two different waiting styles and two different fairness responses to jumper-customer were designed as choices. This experiment showed the learner both choices and then asked the learner to select the acceptable waiting style and jumper-customer response.

**First- and third-person POVs**

Cultural difference is difficult to understand because there are many dimensions and sensitive points that are necessary to discover, such as difference of acceptable manner or different level of behaviour interpretation. Using only flat information may not cover all dimensions to the learner. The preliminary workshop of SES examined how people understand different perceptions, feelings, and reasonings from the first-and the third-person POV. There were two groups of participants: first- and third-person POVs. The same simulation was conducted from the different points of view. The results indicated that different POVs provide different information for the participant, and then they have a different perception and interpretation from the same activities. Thus, we designed different POVs to observe and interact with the agent, to emphasize how much cultural background is related to the learner’s cultural communication learning process, and to confirm the
cultural background influence on communication by adopting the learner’s reaction from this experimental setting.

The first-person view camera was installed close to the eye of the customer avatar; it tracks the avatar during walking and adjusts to the avatar viewing position. The third-person view camera was installed close to the counter as a static camera that captured all the customer avatars and service persons. The camera settings are shown in Figure 1.

**Virtual ticket counter (VTC)**

A shared virtual environment was set up on two computers and sharing on a network for participants to converse, as shown in Figure 2 (left). In the VTC, the participant used their terminal to participate in a shared virtual space. A simple model was designed to control the agent’s behaviour: walking, collision avoidance, requesting and receiving a ticket, and waiting at the counter. The participant’s body movements were captured using Microsoft Kinect and transferred to control the avatar’s movements and posture. It also captured the participant’s walking posture for avatar walking movement and measuring the participant’s rotation for left and right turning directions.

A Wizard of Oz (WOZ) system was applied to control the avatars in this system (Lala et al., 2011). A cultural expert controlled the service person avatar based on predefined rules. The service person avatar could thus naturally respond to the participant in real time according to the WOZ system.

**Experiment**

In our previous study (Thovuttikul et al., 2018), we found that when Thai participants waited in a simulated crowd, some allowed queue-jumpers to get tickets because they were friends of the service person, and/or only one queue-jumper was accepted, and/or staff (queue-jumper was a service person) may be hurrying to work. These reasons show that Thai culture characteristics (High Feminine and collectivism culture) affect the perception and interpretation of Thai participants during cultural dependent activities such as waiting in our previous study.

In this study, we conducted additional experiments with Japanese participants to determine how much Japanese culture affects their perception and interpretation in the waiting

![Figure 1.](image-url) (Left) installed position of first-person point of view camera. (Right) installed position of third-person point of view camera.
Figure 2. System setting and a screenshot of the system.

Table 1. Example experiment sessions.

| Session      | Counter A line waiting                                      | Counter B group waiting                                      |
|--------------|--------------------------------------------------------------|--------------------------------------------------------------|
| 1 (Practice) | Service agent: Fair (No jumper arrives at counter)           | Service agent: Fair (No jumper arrives at counter)           |
| 2 (Same condition) | Service agent: Fair (Reject jumper's order)                 | Service agent: Fair (Reject jumper's order)                 |
| 3 (Diff. condition) | Service agent: Unfair (Accept jumper's order)              | Service agent: Fair (Reject jumper's order)              |
| 4 (Diff. condition) | Service agent: Fair (Reject jumper's order)                 | Service agent: Unfair (Accept jumper's order)              |
| 5 (Same condition) | Service agent: Unfair (Accept jumper's order)               | Service agent: Unfair (Accept jumper's order)               |

Table 2. Participant activity sessions.

| Participant activity section | Participant activity | Tools |
|------------------------------|----------------------|-------|
| 1. Observe the video section | Watch an interaction example | Video of the interaction between the service agent and customer agent at Counters A and B. Agent interaction system (Figure 2). The participant controls their avatar while walking to the counter and ordering tickets. |
| 2. Interaction practice section | Try to control the avatar to get a ticket (to confirm their knowledge from the observation session). | |
| 3. Interaction confirmation section | Control the avatar to get three tickets at the counter they like. | |

Table 3. Reasoning categories.

| Reasoning categories | Reasoning for counter selection |
|----------------------|---------------------------------|
| 1. Fairness          | Friend-jumper customer, friend was rejected, friend was accepted, worried about jumper, jumper's coming, non-jumper's coming |
| 2. Waiting style     | Line waiting, group waiting, random position, waiting position, standing style, orderly line, free style to select the waiting position |
| 3. Speed             | Quicker service, slower service, shorter waiting time, longer waiting time, small number of waiting customers, same waiting time, get the ticket faster, take a long time. |
| 4. Interaction       | Eye contact from service agent, ask jumper to go to end of line, reject jumper's request, accept jumper's request, nice service agent, service agent reaction, bad service, fair service, good service agent. |
| 5. Feeling           | Like the service, boring to wait in line, want to observe both counters, feel bad with service agent. |
behaviour. In order to compare the results with those obtained in the previous study, we used the same conditions and environment as in the previous experiment. The details are presented below.

**Task**

To design the experiment to find culturally influenced factors of communication, we simulated a simple event in the virtual world: waiting to buy a ticket at a counter. We modelled the agent’s behaviour to present two different kinds of waiting style depending on culture: line waiting and group waiting.

The communication behaviour was represented by the agent and experimenter’s avatar. A set of behaviours was used to compare the different perceptions of both participant groups.

**(A) Customer agents’ waiting behaviour:** Two counters, A and B, represent distinctive styles of waiting. The participant sees both counters at the same time and from the same distance. The participant can understand the waiting style from the positions and walking movements.

*Line waiting counter A (Individual):* The customer agent stops in front of counter A behind the previous agent and walks closer to the counter following the line.

*Group-waiting counter B (Collectivism):* The customer agent stops in front of counter B, as close as possible to the counter.

**(B) Queue-jumping customer:** There is a customer agent who is a friend of the service person. He/she stops in front of the counter directly, faces the service person, and places an order, as shown in Figure 3.

**(C) Service person’s fairness and morals:** Service persons serve all customer agents by the ‘first-come-first-serve’ rule in all sessions. When the queue-jumping customer

![Figure 3](image)

*Figure 3.* Jumper customer from (top) first-person POV (bottom) third-person POV.
arrives at the counter, the service person has two kinds of responses: accept (femininity) or reject (masculinity) the request.

(D) Predefined rules for service person and customer behaviour: The service person serves the participant or customer agent a ticket at the counter. The scenario follows these steps: (1) The service person greets and asks for the customer’s order. (2) The customer places the order. (3) The service person acknowledges the order, saying ‘thank you’, moves a hand to prepare a ticket and, after around 5 s preparing the ticket, passes it to the customer. (4) The customer takes the ticket and leaves with it, turning and walking away from the counter.

The participant was asked to imagine that they are visiting an international theme park. People from many countries share the public space together at the theme park. They have to go to the ticket service counter to get a ticket. Sometimes, the staff also goes to the counter to get a ticket and they have to wait in like manner as the customer. Each session comprises three sections: observation, practice, and interaction. We started the observation section by asking the learner to observe the video of the activities. Then, the participant was asked to practice getting a ticket at both counters. After the observation and practice sections, the participant was assumed to have enough knowledge to be able to interact with both service persons. In the final section of each session, the interaction section, the participant was asked to go to any ticket counter they chose three times to get three tickets. Then, the participant was asked to fill in a questionnaire about their choice of counter to evaluate their interpretations and perceptions.

Participants

Thirty-two Japanese students (average age: 21.2, age range: 18–27, =Males: 16, Females: 16, SD: 2.01) were recruited from Kyoto University, Japan, and 32 Thai students (average age: 21.5, age range: 18–27, =Males: 16, Females: 16, SD: 2.01) were recruited from the University of the Thai Chamber of Commerce, Thailand.
age: 22.2, age range: 19–30, Males: 16, Females: 16, SD: 2.94) were recruited from Chiang Mai University, Thailand. Eight male and eight female participants of each group joined the experiment in the first-person view setting, whereas another eight male and eight female participants of each group joined the experiment in the third-person view setting.

**Experimental setting**

The experiments were conducted at Kyoto University, Japan (Figures 4 (Left) and Figure 5 (Left)) and Chiang Mai University, Thailand (Figures 4 (Right) and Figure 5 (Right)). The same activity settings were used in both experiments. Because of the equipment limitations in Thailand, a projector was used to show the simulation instead of a large screen display. The lighting condition differed slightly, but the participants in both places could see the agent and the service person in our simulation clearly.

**Activities setting**

During the experiment, each participant saw all the customer agents and service persons at both counters A and B. The queue-jumper, a friend of the service person, came to the both ticket counters in Sessions 2–5.

Both service persons served with the same level of fairness (both served fairly or both served unfairly) in Sessions 2 and 5. In contrast, they offered a different service in Sessions 3 and 4 (one of them fairly and the other unfairly). One participant joined five sessions. The experiment began with Session 1 – basic communication. The other four sessions were random in order to remove the effect of order from each session (Tables 1).

We started each session by asking the participant to observe a video. Then, the participant was asked to practice. Next, we asked the participant to select a counter and wait for a ticket thrice. Finally, at the end of each session, we asked the participants to state their reason for each choice (Tables 2).

**Physical environment setting**

The Japanese participants interacted with our system in front of a screen; Sharp PN-L702B, diagonal size: 70 inches, width: 65 inches, height: 38.7 inches. During interaction, the participant stood far from the screen, at around 1.5–2 m, depending on their activities: they walked forward (around 1.5 m), or stepped backward (around 1.8–2 m). The Thai participant interacted with our system in front of the projector reflection screen. The size of the screen and standing distance from the screen were the same as those of the Japanese participants.

**Experimental results**

The participants had three chances to select a counter, A or B, in the interaction section of each session. They could freely select the same or a different counter they preferred to wait at.

The participant’s counter selection and its reasons were used as the key experimental results. We called this selection ‘counter selection result’. After they attended each session, we asked them to write their own reason for each selection. We called this ‘reasoning result’.
(A) **Counter selection results:** We obtained all 48 counter selections from the 16 participants in each POV group. Each participant had three chances in each session ($n = \text{number of participants in group} \times 3 \text{ chances of selecting ticket} = 16 \times 3 = 48$). The counter selection results are shown in **Figure 6**.

We applied analysis of variance (ANOVA) to the results to calculate the frequency of selection. There was no significant difference in counter selection between first- and third-person POVs in all sessions, both for the Thai and Japanese participants (Figures 7 and 8).

Further analysis of the counter selection results of each participant revealed that the counter selection results were random. We found that the participants could not confirm their perceptions and interpretations because they were not always going to the same counter for the same reason. However, the reasoning results were more clearly defined with respect to the participants’ thoughts during selection.

**Figure 6.** Counter A selection in total.

**Figure 7.** ANOVA result of Counter A selection: Japanese and Thai participant groups.

**Figure 8.** ANOVA result of Counter A selection: Japanese and Thai participants in first- and third-person POV groups.
(B) **Reasoning results:** As mentioned earlier, we controlled two factors in the experiment – customer waiting style and service person fairness behaviour – to observe the cultural influence on communication. The agents always waited in line at counter A and in a random position at counter B. The service person’s fairness behaviour in each session differed. We grouped all five sessions into two categories: ‘same conditions’ of fairness (both service persons were fair or unfair in Sessions 1, 2, and 5) and ‘different conditions’ of fairness (one service person is fair and the other is unfair in Sessions 3 and 4).

The reasoning answers from the questionnaire were evaluated without considering counter selection because we wanted to consider only the stimuli that the participants perceived from our system during counter selection in the experiment. We found that selection reasoning (Table 3) could be categorized into the following reasons:

1. Queue-jumper/fair or unfair service
2. Waiting style/waiting position
3. Speed (waiting speed, service speed)
4. Interaction (with service person)
5. Feeling (like, dislike, worried, happy, or angry)

We used ANOVA to analyse the reasoning results to determine the participants’ perceptions while selecting a counter. The results of the reasonings of the Japanese and Thai participants are shown in the box plot in Figures 9 and 10. The graphs present the mean and standard deviation of each reasoning from both groups: first- and third-person POV groups.

We compared the cultural influence between the Thai and Japanese participant groups based on the different waiting styles and level of fairness conditions. After all reasoning of the counter selection, we categorized by the grouping similar meaning method (Celtananto & Dubois, 2017).

The main effect was seen in the significant difference in ‘speed’ reasoning when comparing ‘same cond.’ sessions (Sessions 1, 2, and 5) and the ‘diff. cond.’ sessions (Sessions 3

![Figure 9. Reasoning results of Thai participants.](image-url)
and 4), \((F(1, 62) = 3.431, p = .0225)\). This effect indicates that the tendencies of giving the reasoning that related to speed of service or waiting process in the Thai and Japanese groups were different. The participants in the Japanese group paid attention to speed reasoning more than the Thai group in all sessions. For further analysis, we plotted the ANOVA results of speed, as shown in Figure 10.

A significant difference was found on ‘interaction’ reasoning \((F(1, 62) = 4.627, p = .0056)\) and ‘feeling’ reasoning \((F(1, 62) = 8.137, p = .0001)\). These results show that when we compare the participants from the Thai group and Japanese group, the participants in the Thai group gave reasoning related to the service person’s interaction and their own feelings (sensibility) as supporting reason when choosing the preferred counter for waiting more than the Japanese participants.

We did not find any significant difference in ‘waiting style’ and ‘fairness’ reasoning, but we found that most participants in both groups gave a reason for their choice related to fairness in the ‘diff. cond.’ session (when one service person in counter A or B performed unfair service while the other performed fair service). At the same time, when they focused on fairness in the ‘diff. cond.’ session, both groups of participants did not use a waiting style or their waiting position to consider the situation.

In addition, the participants in the first- and third-person POV groups had a tendency to give a different reasoning. We set the same service time and same number of participants in both counters A and B, with the same waiting time at both counters. When the unfair service person who accepted ticket requests from their friend served the ticket slower than the fair service person who rejected the ticket request from the jumper-customer, the participant in the third-person POV group wrote speed reasoning result more than the participants in the first-person POV group in both Japanese and Thai cultures, as shown in Figure 11.

In contrast, interaction and feeling depend on personal decision. The participants in first-person view from both Japanese and Thai cultures had a tendency to write about their opinion of the service person’s behaviour to customer or jumper-customer and their feeling regarding the waiting style or fairness level of the service person. The
interaction reasoning result is shown in Figure 12 and feeling reasoning result is shown in Figure 13.

The participants from different POV groups gave different reasons for deciding their choice of interaction. When the first- and third-person POVs from the same culture were compared, it was found that participants from the first-person POV group gave comments related to interaction and feeling more than participants from the third-person POV group, as shown in Figures 12 and 13, respectively. In contrast, the fact and benefit of activities such as speed were ignored by participants in the third-person POV group when one of the service persons performed unfair service by accepting the jumper-customer’s request in the different conditions of fairness session, as shown in Figure 11.

**Discussion**

In this study, we compared the effect of Thai and Japanese cultures on participants’ perception of fairness in waiting behaviour. Each participant interacted with an agent in the

![Figure 11](image1.png)

**Figure 11.** Speed reasoning results in ‘same conditions’ and ‘different conditions’.

![Figure 12](image2.png)

**Figure 12.** Interaction reasoning results in ‘same conditions’ and ‘different conditions’.
virtual simulation in first- and third-person POV. The participants in each group of POV had a different direction to observe and participate in the event in the system.

A novel contribution of this paper is that we determine the effect of cultural background on the perception of different fairness levels in waiting behaviour. Participants should generally prefer fair service, especially when waiting or queuing, benefits such as waiting time and orderly service should be preferred by the customer. We found that most Japanese participants worried about speed (84.38%, 27 of 32), which was more than the corresponding number of Thai participants (65.63%, 21 of 32). This fact indicates a cultural masculinity dimension (score = 95), which involves competitiveness and the desire to protect their rights. In contrast, of the total Thai participants who accepted the queue-jumper (2 of 32), some Thai participants ignored the queue-jumper factor and continued to wait at their preferred counter because they thought that the person might be in

Figure 13. Feeling reasoning results in ‘same conditions’ and ‘different conditions’.

Figure 14. Cultural perception and interpretation model.
a hurry or have a reason to do this rude behaviour. In contrast, there were no Japanese participants that forgave the jumper or thought of the jumper’s personal reason for cutting line. This result confirms that Thai participants were relaxed and did not stress upon force or urgency waiting; this Thai culture reflects femininity (score 34).

The different POVs provide learners with a different set of information from the activities. The first-person view takes care of the interaction with service persons and uses their feelings to decide to go with their own choice because the participant in first-person view interacts with the simulation closer than the participant in third-person view. Thus, their attention will focus closer on providing information from the system such as service person’s behaviour (accept or reject jumper-customer, gesture, body direction, and face direction during conversation).

Different cultures consider communication from different directions. Waiting was used as an example of communication in this paper. Fairness in waiting should be preferred in general, but we can see that Japanese and Thai participants accepted a different level of fairness for variety reasons. In order to develop the learning system to help participants understand how other cultures communicate, we have to carefully design the POV of the system to visualize the hidden reason that may be concealed by a cultural filter. For example, to help Japanese participants to emphasize Thai culture in the waiting scenario, the first-person POV should be preferred for them because they would then understand the feeling and the interaction more than in third-person POV. The interaction and feeling are important because most Thai participants focused on interaction and feeling during the interaction. In the other direction, if we have to design a system to help Thai people learn Japanese waiting style, third-person POV provides factual information that would help Thai people to understand the situation and ignore their own feelings during learning with our system.

To start developing the basics of different cultural communications for our system, we have to start our process with a group of people who can learn the difference, understand the technology of the simulation system, and can adapt their experience to the virtual simulation system and provide us with the reasoning underlying their behaviour. The participants in this experiment were therefore educated young people from both Thailand and Japan.

**Conclusion and future work**

This study explored the learning of cultural differences from first- and third-person POVs. Different perceptions and interpretations were expected from the different cultures: Japanese and Thai. An experiment was conducted to find the cultural effect on fairness perception in waiting behaviour by using a simulated crowd.

The participants in the first- and third-person POV groups performed the same activities in the experiment, specifically, buying tickets from two counters. Queue-waiting and group-waiting styles were used in the system. We confirmed with concrete results that culture has an influence on human behaviour and POV also affects their situation interpretation by analysing their reason for selecting a counter.

A novel contribution of this paper is that we determined the effect of culture on waiting behaviour at different levels of fairness. The Japanese participants focused on speed as performance from waiting activities. They gave reasons related to waiting time, number
of waiting customers, and the service speed of the service person. This result confirms that they are a masculine culture. In terms of the collectivism culture, we found that the Thai participants forgave jumper-customers because the queue-jumper was a friend of the service person. We conclude that the collectivism dimension can refer to groups and relationships in Thai culture and they forgive jumpers because they are a feminine culture.

First- and third-person POV processes prepared the participants with different information. First-person POV prepared the information based on feeling and realism as in the real world. Third-person POV provided the information as a simulation to learn a fact or rule of the communication. The people from both cultures interacted with our simulation and understood the information based on the POV and their own cultural background. We carefully selected a suitable POV for the participants based on their cultural backgrounds, as discussed above.

As our main goal in this project is to enable learning communication between people, the basic idea is that the communication should be based on the message to be transferred. However, during the transfer, there are many processes involved in producing the message for each type of communication. Discovering cultural factors and the POV method are options that can help us understand the ways of other cultures more deeply.

In future work, we plan to apply our findings to the cultural agent field, such as developing agent models and cultural learning assistance systems (Figure 14), and use the cultural parameters to adjust the culture-related functions in our system such as the agent model (decision-making or behaviour) and story (scenario or lessons) to help learners understand not only communication but, more importantly, culture-specific communication as well.

**Disclosure statement**

No potential conflict of interest was reported by the authors.

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