

# Study of the Effects of Japanese Tea Ceremony Will Give the Peace of Mind of Guests

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**Abstract.** Tea ceremony, which is considered to be the representative of Japanese traditional culture, is used as one of methods to learn the spirit of “Omotenashi” that is a particularly Japanese form of hospitality. That is because when conducting a tea ceremony, care and sympathy shown toward one’s guest is considered to be the most important. In tea ceremony, there are attitudes, such as “Treasure Every Meeting, For It will Never Recur” that are crucial when hosting guests. Especially, attitudes that “the host must prepare thoroughly for the guests, stage a pleasant experience” and “the guests enjoy the preparation of the host” are important. In “Omotenashi”, the side that is providing the service and the side that is receiving the service are equal, and the guest and the host (the one who invites guest) are also equal in tea ceremony. Moreover, there are many types of utensils (tea things) that are used for tea ceremony. Many of them are specific to tea ceremony, and the ways they are used are also unique. Originally, tea ceremony (Sado) was called “Chato” or “Cha no Yu”. The name “Sado” was adopted in early Edo period, and it is used until today. The ultimate aim of tea ceremony is the sense of harmony between the host and the guest. Therefore, elements such as tea things, chiefly among them the tea bowl, or hanging scroll with Zen wisdom hang in the alcove of tea room are more than just individual artworks. Rather, they are parts that constitute the whole, and the passing time of tea ceremony itself is regarded as a total work of art. The traditional Japanese act of boiling water, prepare tea and serve it, and the style and art based on this act, is considered to be a particularly Japanese “Omotenashi”. In tea ceremony, the host that is holding the ceremony invites guests after careful preparation, and the guests are expected to understand the intention of the host, behave appropriately to the situation and show gratitude. In other words, they create pleasant space by the host and the guests becoming one. This “reciprocity of the host and the guests” is also called “unity of the hosts and the guests”. In our series of research, we study that the Japanese tea ceremony will

give the peace of mind of guests or not. We made several groups as customer of tea ceremony. Each customer set heart rate meter and measured the R-R interval. After the experiment we analyze the peace of mind on each step (called Otemae) of the tea ceremony. We found that peace of mind is different for each group. By analyzing peace of mind in the tea ceremony, we will be able to enjoy Omotenashi, based on the spirit of tea that aims to “Treasure Every Meeting, For It will Never Recur”.

**Keywords:** Tea ceremony · Heart rate · Process analysis · The peace of mind of the guest

## 1 Introduction

In Japanese culture there are many items in which name includes Chinese character of Dou, Do or Michi (道). For example; international sport of Jyudo, Japanese fence of Kendo, Japanese archery of Kyuudo, next new olympic game event of Karatedo, Japanese flower arrangement of Kado, enjoying smell of Koudo, Charigraphy of Syodo, and enjoying powder tea of Sado are good item. Dou is Japanese people’s sense of values and the meaning of Dou is training of person’s mentality through activity in one item.

Among them Sado was established by Rikyu Sen during Azuchi-Momoyama period (1573–1603). The main concept is OMOTENASHI mind which is Japanese hospitality. In Sado each action involves the meaning and it can be said that all of action is supported by OMOTENASHI mind. A once-in-a-lifetime chance concept which we cherish our encounter is good example.

Recently Sado has been of particular interest among business persons for training mentality. In tea ceremony room person’s mental becomes steady and such environments create new findings of business. However, there very few researches which discuss about people’s physiological response in tea ceremony room. In this paper participant heart periods were measured. The participants were selected as 5 categories; Japanese persons who knows Sado well, Japanese person who did not know Sado, Japanese students, foreign students who attended tea ceremony explanation lecture or not. Value of tone and entropy was calculated and generation of peaceful mind c in the tea room was discussed.

## 2 Tea Ceremony

Tea ceremony supported by Urasennke can be divided into 7 processes. Those are 1, Enter the room and sit down 2, Sweets are served 3, Tea-serving manners begin 4, Eat sweets 5, Tea is served 6, Drink tea 7, Head towards the end.

As shown in Fig. 1.



1, Enter the room and sit down



2, Sweets are served



3, Tea-serving manners begin



4, Eat sweets



5, Tea is served



6, Drink tea



7, Head towards the end

**Fig. 1.** Process of tea ceremony.

### 3 Experimental Procedure

Tea ceremony room is shown in Fig. 2 The area is 7.3 m<sup>2</sup> which is composed by 4.5 sheet of Tatami. One Tatami is 90 cm × 180 cm. Shape is square. On Friday, November 4th, Inside Umekoji Park Green mansions.



Fig. 2. Tea ceremony room

#### Experiment plan

Experiment subject waiting room Laboratory A. Heart rate experiment Laboratory B.  
Subject group 8 mats

10:00 Start of experiment 10:00 ③Japanese students  
11:10 ①Kyoto's peoples 12:20 Break time  
13:10 ④Tea ceremony explanation lectured foreign students  
14:20 ⑤Tea ceremony explanation not lectured foreign students  
15:30 ②Osaka's peoples  
16:40 The experiment end

Autonomic nervous activity is evaluated by measuring the heart beat interval (RRI) with your feeling of tension and relaxation when tea-serving manners.

1. Subject wearing heart rate meter in separate room. After wearing, confirm that the sensor and the monitor are connected.
2. Everyone presses the video camera's shooting start and heart rate meter switch at the same time. Then rest for about 10 min. Camera charge hold the video camera with your hand and shoot.
3. After that, move to tea room. In the meantime, video camera keeps shooting. Heart rate meter remains measured.
4. Set the camera in the tea room. And, everyone starts about position.
5. After finishing, the shooting of the video camera is ended. The heart rate meter is also ended.

## 4 Result and Discussion

### 4.1 Behavior of Participants in Tea Ceremony Room and Process Analysis

According previous analysis tea ceremony can be divided into 7 process. Table 1 shows participants behavior in tea ceremony room.

**Table 1.**

Time (Minute)	Time (Seconds)	Subject A (Umemura)
0	0	Heart rate monitor is started
1	16	Enter the room
1	28	Sit
1	50	Instruct students to prepare a seat chair
2	5	Make subject A' legs comfortable
2	23	Chat with subject B
2	37	Watch the students bring the seat chair
2	47	Chat about how to use the chair
3	20	Watching sweets being brought in, reseat straight sitting (sit up straight)
3	30	Watch sweets which Ms. Ota bring
3	35	Take a bow
3	37	Talk with Ms. Ota
3	39	Bow to Ms. Ota
3	45	Watch Ms. Ota leaves the room
3	49	Watch his/her sweets
3	55	Watch Ms. Ota bringing sweets
3	59	Watch sweets
4	2	Subject A bows and brings his/her sweets in front
4	9	Watch his/her sweets
4	15	Change the position of his/her sweets and watch it
4	20	Watch sweets which Ms. Ota bring
4	23	Watch sweets of Subject C
4	30	Take a bow
4	32	Watch his/her sweets
4	48	Watch sweets of Subject D
4	59	Watch Ms. Ota going away
5	4	Watch his/her sweets
5	6	Watch sweets which Ms. Ota bring
5	11	Watch sweets of Subject E
5	15	Take a bow
5	18	Watch sweets of Subject E

(continued)

**Table 1.** (continued)

Time (Minute)	Time (Seconds)	Subject A (Umemura)
5	20	Watch Mizuya that it is a chest of drawers in a tea-ceremony room
5	31	look around for
5	35	Watch the kettle
5	41	Talking to subject B to eat sweets, everyone tries to eat sweets
5	47	When they tried to eat sweets, the tea master came and they bowed
5	51	Observe the movement of the tea master
5	55	Watch the tea ceremony equipment the tea master placed
6	18	Observe the tea master movement and tea ceremony equipment
6	44	It is suggested to eat sweets and he/her bows
6	51	Cut the sweets
7	3	Eat the sweets
7	24	Put the paper in a tatami mat and observe the movement of the tea master
7	52	Change the position of the paper and look at the paper
7	59	Talking about sweets with the tea master
8	3	Observe the movement of the tea master
9	23	Scratch the face
9	25	Observe the movement of the tea master
10	15	See Ms. Ota coming into the room
10	17	Observe the movement of the tea master
10	31	Watch the finished tea (Watch a made tea)
10	36	Change posture (because the tea master told that it is okay to make my legs comfortable)
10	43	Watch Ms. Ota bringing tea
10	46	reseat straight sitting. (sit up straight) 正座: straight sitting
10	47	Watch Ms. Ota's movement
11	1	Take a bow
11	4	Move the tea in front
11	8	Take a bow
11	10	Pick up the tea bowl (hold the tea bowl)
11	13	Turn the tea bowl clockwise
11	17	Drink tea
11	31	Finishing drinking tea and wiping the tea bowl with his/her fingers
11	38	Turn the tea bowl and put it
11	39	Take a bow
11	42	Put a cup in front
11	45	Talk with Ms. Ota
11	48	Observe the movement of tea master
11	53	Watch his/her tea bowl and chat
12	0	Observe the movement of the tea master

(continued)

**Table 1.** (continued)

Time (Minute)	Time (Seconds)	Subject A (Umemura)
12	7	Watch the finished tea (Watch a made tea)
12	13	Move the tea bowl
12	15	Watch the tea of subject B
12	20	Observe the movement of the tea master
12	22	Watch the tea of subject B
12	23	Observe the movement of the tea master
12	40	Pass the tea bowl to Nakatsugi (the mediator)
12	44	Observe the movement of the tea master
13	2	Watch subject B
13	4	Watch the tea of subject C
13	36	Observe the movement of the tea master
13	48	Watch the tea of subject C
13	49	Chat with the tea master
13	55	Observe the movement of the tea master
14	10	Listen to the tea master's speech and chat with each other (everyone)
14	36	Observe the movement of the tea master
14	40	Watch the tea of subject D
14	41	Observe the movement of the tea master
15	2	Listen to the voice of subject D, and watch his/her
15	3	Observe the movement of the tea master
15	5	Watch the tea of subject E
15	7	Observe the movement of the tea master
15	12	Watch the finished tea (Watch a made tea)
15	33	Watch the kettle
15	40	Watch the tea of subject E
15	43	Observe the movement of the tea master
16	9	Take a bow
16	14	Observe the movement of the tea master
16	32	Chat with the tea master
18	25	Observe the movement of the tea master
18	40	The tea master told that it is okay to make his legs comfortable, then Subject A bowed and started a chat
19	4	Observe the movement of the tea master
19	19	Take a bow
19	28	Make his/her legs comfortable, and chat about heartbeat by all the members
20	31	Stand up and leave the room

This is useful data for investigate serenity by using RR interval of heart rate meter. Therefore, precious observation was needed. In this table process 1 is from 0:00 to 03:20, 2 is from 03:20 to 05:47, 3 is from 05:47 to 06:44, 4 is from 06:44 to 08:03, 5 is

from 08:03 to 11:17, 6 is from 11:17 to 11:42 and 7 is from 11:42 to 20:31. Figure 3 shows example photos just before and after drinking tea. Right side white shirt man was focused. Before drinking tea, his face was very nervous, on the other hand after drinking we can found smile on his face. This simple result suggests us that tea ceremony brought some change in feelings.



Fig. 3. Example photos just before and after drinking tea.

## 4.2 RR Interval Measurements

### Tone-entropy method

The methodology of analysis has been described in detail previously. [1–3] In brief, acquired heart periods (R-R intervals) are transformed into percentage index (PI) time series:



$$PI(n) = \frac{H(n) - H(n + 1)}{H(n)} \times 100$$

where  $[H(n)]$  is a heart period time series, and  $n$  a serial number of heart beats. The tone is defined as an arithmetic average (first-order moment) of this PI time series as:

$$\sum_n \frac{PI(n)}{N}$$

where  $N$  is a total number of PI terms. The entropy is defined on PI probability distribution by using Shannon’s formula [4]:

$$- \sum_i p(i) \log_2 p(i)$$

where  $p(i)$  is a probability distribution that  $PI(n)$  has value in the range,  $i \leq PI(n) < i + 1$ ,  $i$  an integer.

In this experiments Data 3 min before and after of drinking tea was selected. Value of tone and entropy was calculated and mean value was obtained.

The tone, balance between acceleration ( $PI > 0$ ; decrease of heart period) and inhibitions ( $PI < 0$ ; increase of heart period) of the heart, because positive PI reflects instantaneous accelerations and negative. PI instantaneous inhibition of heart, respectively. At first sight, one might consider that the tone is to be zero for stable heart rate process. However, the actual tone is not zero, rather reflects the sympathy-vagal balance faithfully as appreciated in all the previous studies [1–3]. The entropy evaluates total acceleration-inhibition activities, or total heart period variations, in a familiar unit of bit. As the results of Wilcoxon signed-rank test, tone decreased significantly ( $p < .05$ ), whereas entropy didn’t change.

Figure 4 shows the entropy and tone change before and after drinking tea. Both values shows decreasement that means total acceleration-inhibition activities are decreased by the entropy data, and also the tone tends decreasement, which indicate relaxation of feeling. The tone data is significant at 5% level.

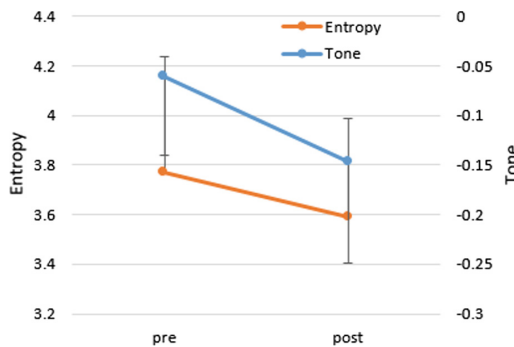


Fig. 4. Tone-average and Entropy-average

## 5 Conclusion

In this paper the peace of mind of the guest during Japanese tea ceremony can be obtained or not was discussed. The systematic experiments were performed and the number of participants were 25 totally including 5 different groups. First the process analysis was made during tea ceremony and 3 min before and after drinking tea was focused. By using heart rate meter value of tone and entropy was calculated. Consequently, peaceful mind can be generated by drinking tea was clarified.

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