Investigating Self-disclosure and the Amount of Speaking in an Online Meeting Under the Rule of Casual Talking and Casual Listening

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Abstract—This paper investigates an online meeting under the rule of casual talking and casual listening (CTCL). Four different meeting styles with respect to spatial and temporal viewpoints were compared by recruiting a total of 60 university students using questionnaires. The results revealed the followings: (1) the degree of participant' self-disclosure in the online meetings was not significantly different from the baseline; (2) it was preferred to use a more familiar interface like a timeline; (3) an online meeting under the CTCL rule was more effective for people with a lower disclosure than the case with a higher disclosure; (4) it is important to provide an appropriate discussion subject to improve the self-disclosure of participants; and (5) a Delay function was suitable to talk with participants who had various degrees of social anxiety.

Keywords–Tojisha-kenkyu; Social networking system; Text chat system; Casual talking casual listening; Communication Interface; Self-disclosure; Social anxierty.

I. INTRODUCTION

A. Background

The Japanese word, *tojisha-kenyu* means a research by interested persons for themselves. It is a practical activity in which people with a difficulty or a mental disorder engage in to recover from their problems. The activity consists of sharing ways to deal with various difficulties and finding words to explain what is happening to yourself [1][2]. The most basic activity is to gather and share information with persons who have the same difficulties. There is a fundamental rule of casual talking and casual listening (CTCL) that is a facilitating technique used by self-help groups, such as Alcoholics Anonymous. These activities are expected to uncover new finding.

However, it is not easy to increase the number of participants in *tojisha-kenkyu* because of the following reasons: (1) when the number of participants increases, the recording effort also increases; (2) it is often difficult for many people to gather at one site because of the constraints of location, time, and the physical problems of participants; and (3) there is a limit to the number of participants in a meeting because time and space are limited. A web-based system for conducting a meeting online will solve these problems. However, to the authors' knowledge, there is no research on online meetings with the CTCL rule.

B. Objective

The aim of this study is to investigate an online meeting under the CTCL rule. From the study, we also expect to draw out implications about designing a suitable online meeting interface for each user.

C. Method

In this study, we conducted an experiment in which university students participated in online meetings with the CTCL rule using a web-based interface. Since it is important for participants to be able to speak and hear more easily and this is strongly affected by the interface, examining the effectiveness of the interface was important. Then, we constructed four interfaces that were different from each other on two aspects: spatial and temporal. The spatial difference in the interfaces was whether spoken texts were displayed on one line, which is called a timeline, or at random positions. The temporal difference was whether there was a delay in displaying a text inputted by a user. The intention was to weaken the relationship between multiple text messages. It was expected that if the context became weaker, the conversation would become difficult to maintain. In addition, participants' name and ID were not visible to others (the meetings were held anonymously). In the experiments, we first evaluate whether an online meeting using the standard interface led to a good outcome for participants by measuring self-disclosure. Second, to investigate the effect of different interfaces, we measured the relationship between an index called self-disclosure and social anxiety and the number of words inputted from the participants.

D. Structure of this paper

This paper is organized as follws: In Section II, we introduce to practice *tojisha-kenkyu* and CTCL rule. In Section III, we show the experiment which is conducted in this paper, and we also show the results of the experiment in Section IV. After that, Section V discusses about the results. And, in Section VI and VII, we mention about an implication and limitation, respectively. In Section VIII, we conclude this paper.

II. How to practice tojisha-kenkyu

In *tojisha-kenkyu*, the most basic activity is to gather and share information with persons with similar difficulties. This section shows an example of a *tojisha-kenkyu* meeting with the CTCL rule.

A. Proccess

An organizer announces information, date, place, meeting theme, and basic precautions through a mailing list several weeks in advance. If a receiver is interested in attending the meeting, he or she can apply for participation. Cancelling the participation is also allowed.

On the meeting day, participants gather at the venue and conduct a face-to-face meeting with the CTCL rule. Participants seat in a circle along with the facilitator, who takes the initiative. First, the participants are informed about the meeting and the rules. Next, starting from the facilitator, the participants speak one by one in turn to warm up. After that, they speak about some topics in the same way. For convergence of the meeting, a time limit (from 1 to 3 minutes) is imposed on each speaker.

B. Keep talking and keep listening (CTCL) rule

It is recommended that the participants follow the CTCL rule. The rule has two components: speaking and hearing. According to the speaking component, the participants need to speak based on their experiences and feelings. The participants are recommended to try to speak even if it is difficult for them to express themselves. But the participants should not be forced to speak. Participants are also allowed to pass their turn. According to the hearing component, a participant needs to hear the others' stories without talking, nodding, or eye contact.

C. Self-disclosure and CTCL rule

In a CTCL meeting, participants need to speak only about the meeting theme. It is important that the speaking is based on self-experiences and feelings. Such a speaking from a subjective viewpoint, which is not based on an objective opinion or knowledge, is closely related to a self-disclosure [3]. The word *self-disclosure* is defined as "*act of revealing personal information to others in phycology.*" Autobiographies that include an element of self-disclosure contribute to the development of *tojisha-kenkyu*. However, it is not easy for everyone to publish an autobiography. There is a function in *tojisha-kenkyu* that gets the story out of many persons.

D. Social anxiety and CTCL rule

Audiences and being judged by them create anxiety in people, called social anxiety [4]. The word *social anxiety* is defined as "*anxiety resulting from the prospect or presence of personal evaluation in real or imagined social situations.*" In a CTCL meeting, to reduce such a psychological anxiety, talking, nodding, and eye contact is not allowed. An online meeting system can also help reduce the anxiety. In particular, almost all persons with developmental disabilities have such anxiety because they have little experience sharing their difficulties.

III. Experiment

This section describes the experiment to evaluate the effectiveness of a CTCL meeting using an online system and to examine the effects of interfaces implementing our spatial and temporal concepts.

A. Method

1) Analyzing data: We analyzed the questionnaire responses and contents spoken by participants in meetings. The meeting participants used one of four interfaces. The analysis employed a between-subjects comparison. The participants answered questions about self-disclosure and social anxiety in their regular life in prior questionnaires. After the meeting, the participants answered another questions about self-disclosure for the online system using in the experiment.

2) Measuring self-disclosure: In order to measure the self-disclosure of participants, we employed the questionnaire ESDQ-45, which was developed by Enomoto [5] and translated and inspired from JSDQ-60 [6]. It is a questionnaire in Japanese on a 5-point Likert scale and consists of 45 items belonging to 15 categories ($c01$, $c02$, ..., $c15$). Points 1 to 5 mean respectively "*do not disclose at all the contents,*" "*not disclose much,*" "*neutral,*" "*disclose,*" and "*disclose enough about the contents.*" For example, one of the content is "*own current goal,*" and it is categorized as $c03$ ("*intentional aspect of spiritual self*"). In the experiments, to measure the degree of disclosure in the usual living environment, we asked the participants whether they have someone to talk about each item. The revised meanings of points 1 to 5 are respectively "*have no one to talk about the contents,*" "*have few person to talk*" "*neutral,*" "*have someone to talk,*" and "*have someone to talk enough about the contents.*" The aim was to evaluate how much the online system can support a participant compared to the existing environment. Therefore, in the questionnaire after the meeting, we measured the degree of disclosure of participants using the online system. Then, points 1 to 5 in this case mean respectively "*do not disclose at all the contents,*" "*do not disclose much,*" "*neutral,*" "*disclose,*" and "*disclose enough about the contents.*" In both the cases, the value of self-disclosure is expressed as the total score of the answers to 45 questions. Thus, the value ranges from 45 to 225.

3) Measuring social anxiety: In order to measure the social anxiety of participants, we used a questionnaire of Interaction-Audience Anxiety (I-AA) scale translated and modified by Okabayashi et al. [7] from Leary's social anxiety scale [8]. It is questionnaire in Japanese on a 5-point Likert scale and consists of 14 items about two aspects, audience anxiety and interaction anxiety. Points 1 to 5 mean respectively "*strongly disagree,*" "*disagree,*" "*neutral*" "*agree,*" and "*strongly agree.*" The value of social anxiety is expressed as an average of the answer to the 14 questions. For exsample, one of the questions in audience anxierty aspect is "*I usually get nervous when I speak in front of a group.*"

B. Using interfaces

In this study, we employed a text-chat system as a way to conduct an online meeting. Text-based systems have higher anonymity compared with sound- or video-based systems. If an unspecified number of people participate through the system, it is better to have high anonymity from the viewpoint of privacy. We also employed a real-time chat system. It is close to the

concept of *tojisha-kenkyu* that participants share the same place and time while discussing.

In a text-based communication system, the contexts of conversations are constructed and arranged by time, space, and user IDs such that texts are spatially arranged with time stamps or user information. Computer-mediated communication (CMC) contributes to increasing the anonymity of people; however, it also brings a behavior based on a lack of social morality [9]. To suppress the problem and to let the participants focus on the meeting obeying the CTCL rule, we think that it is effective to blur the relationship between each text spoken by participants. Such blurring can be implemented using two kinds of ways that are spatial and temporal rearrangement.

Spatial rearrangement is to display texts spoken by participants without spatially organizing. A CTCL meeting is similar to the brainstorming process because the participants do not need to consider evaluation by others and they can speak freely about the current topic [10]. In this method, it is important that everyone just expresses their ideas without organizing them. For this reason, displaying text without spatially arranging may also promote speaking in a CTCL meeting. In order to implement the concepts into a real-time chat system, we propose the method of spatial rearrangement.

Temporal rearrangement is to intentionally delay for displaying text spoken by participants. Conversation is constructed by turn-taking [11]. Such conversation causes unnecessary evaluation and advice from others. For this reason, to complicate to do turn-taking between participants may promote concentration on thinking and speaking of each person. In order to implement the concepts into a real-time chat system, we propose the method of temporal rearrangement.

These spatial and temporal concepts make it difficult for users to recognize contexts, and establish conversations. For this reason, participants will not try to talk each other. There is an etiquette of not replying to a malicious person in an online system with higher anonymity. Our proposal is expected to contribute to compliance with such etiquettes.

In our spatial rearrangement, the interface displays texts at random positions as staggered rows without aligning in a line, which is called "*timeline*" (Figure 1). In our temporal rearrangement, the interface delays displaying of texts sent from participants. Our proposal is to weaken relationship between spoken texts. Then, we implemented four interfaces that differ from two viewpoints, spatial and temporal, as shown in Table I. In the case of Timeline (TL), new text is displayed at the top of other texts. In the case of Random (RND), new text is displayed randomly in blank spaces, which are tiled constantly. In the case of No delay (Nodelay), new text is displayed as soon as it is sent. In the case of Delay, new text is displayed after a delay of few seconds after it is sent. In all cases, the oldest text is archived when the display area becomes full. Thus, there are four different combinations possible: TL-Nodelay, TL-Delay, RND-Nodelay, and RND-Delay. These can also be treated as experimental conditions.

C. Experimental settings and conditions

The participants (33 males and 27 females, having the age between 19 and 24) were undergraduate and graduate students in the university of the first author. They were enrolled in this experiment as part-time employees. The theme of

(a)

(b)

Figure 1. Using interfaces: (a) shows an exsample of the timeline interface, and (b) shows an exsample of the random interface.

TABLE I. IINTERFACES COMBINING SPATIAL AND TEMPORAL REARRANGEMENT. THE INTERFACES ARE ALSO EXPERIMENTAL CONDITIONS.

Interfaces (Conditions)		Spatial	
		Timeline (TL)	Random (RND)
Temporal	No delay	TL-Nodelay	RND-Nodelay
	Delay	TL-Delay	RND-Delay

the meetings was "*worries about interpersonal relationships,*" which has high commonality between the subjects. The setting was close to the premise of *tojisha-kenkyu* that all participants have the same worries or difficulties. Each interface was an experimental condition, and each participant took part in experiments in only one condition. Concretely, three meetings with five participants each were hold for each condition, and thus, the total number of participants was 60 (4 conditions × 3 meetings × 5 participants/meeting). Each mechanism of the interface was explained to the participants on ahead. In the case of Delay, the delay time was set from 15 to 60 seconds during the experiments. Each meeting was held about 36 minutes (the first half of 18 minutes and the second half of 18 minutes). A topic of the first half was about above theme, and a topic of the second half was "*what are you dealing with about worry about interpersonal relationships and what do you want to do?*"

IV. RESULTS

A. Major relations

In order to outline the major relations between variables, we show Pearson's correlation coefficient between each data point (N = 60) in Table II. "*IAA*" indicates the degree of social anxiety, "*ESDQpre*" indicates the degree of self-disclosure

TABLE II. PEARSON'S CORRELATION COEFFICIENT BETWEEN EACH DATA POINT (N = 60).

	IAA	ESDQpre	ESDQsys	dESDQsys	#words
IAA	1.00				
ESDQpre	−.28*	1.00			
ESDQsys	−.02	.11	1.00		
dESDQsys	.22	−.74***	.59***	1.00	
#words	−.19	.24	.18	−.07	1.00

TABLE IV. PEASON'S CORRELATION COEFFICIENT BETWEEN IAA AND OTHER DATA FOR EACH CONDITION (N = 15).

	IAA			
	TL-Nodelay	TL-Delay	RND-Nodelay	RND-Delay
dESDQsys	.61	−.08	.16	−.03
#words	−.31	−.14	−.36	−.03

in the usual living environment, "*ESDQsys*" indicates the degree of self-disclosure of participants in the online system, "*dESDQsys*" indicates the difference between ESDQpre and ESDQsys, and "*#words*" indicates the number of words in texts posted by a participant. Note that the same base word was counted only once and symbols were not counted, and the morphological analysis was conducted using MeCab [12]. The test statistic of IAA and ESDQpre was $p = .033$; thus, it met the significance level of 5%. There is a weak negative correlation between the two parameters. No correlation was observed between IAA and ESDQsys, IAA and #words, ES-DQpre and ESDQsys, and ESDQsys and #words. However, there is a strong negative correlation between ESDQpre and dESDQsys.

B. Interface effects

In order to investigate the interface effects, we show the values of mean and standard deviation of each data for each condition (N = 15) in Table III. The IAA of the persons in TL-Nodelay and RND-Nodelay was high, but that of persons in TL-Delay and RND-Delay was not high. The ESDQpre was also different accordingly. This result confirms that there is a correlation between IAA and ESDQpre. Despite this result, dESDQsys was positive in TL-Delay and negative in RND-Nodelay. By the two-way factorial ANOVA for spatial and temporal factors, it was found that there was no effect of interaction between the factors and there was a significant difference between the spatial factors whether timeline or random ($p = .049 < .05$).

C. Relevance between personality and interface

In order to investigate the relevance of the effects between participants' personality and interfaces, we show Pearson's correlation coefficient between IAA or ESDQpre and other data for each condition (N = 15) in Table IV and Table V. A correlation was observed between IAA and dESDQsys in TL-Nodelay. In TL-Nodelay and RND-Delay, there was a weak negative correlation between IAA and #words. On the other hand, there was no correlation between IAA and #words in TL-Delay and RND-Delay. In TL-Nodelay and RND-Nodelay, there was a very strong negative correlation between ESDQpre and dESDQsys. The correlations in TL-Delay and RND-Delay were lower than those in the other conditions. In TL-Delay, there was a positive correlation between ESDQpre and #words.

TABLE V. PEARSON'S CORRELATION COEFFICIENT BETWEEN ESDQpre AND OTHER DATA FOR EACH CONDITION (N = 15).

	ESDQpre			
	TL-Nodelay	TL-Delay	RND-Nodelay	RND-Delay
dESDQsys	−.88	−.68	−.91	−.67
#words	−.04	.64	.16	.14

V. DISCUSSION

The interface of TL-Nodelay is baseline of online meeting with CTCL rule, because it was made based on a conventional interface. The results revealed that the degree of self-disclosure for unfamiliar (anonymous) people on the system is almost the same from the disclosure for the usual living environment. The degree of self-disclosure was not only maintained but also increased by using a system. We think there are two reasons that are application of the CTCL rule and using the CMC system. But, it is not only necessary to use an online system but also preferred to use a more familiar interface like timeline. On the other hand, the degree of self-disclosure in the usual living environment is the major factor contributing to changing of the disclosure in an online system. The online system and the CTCL rule are more effective for a person with a lower disclosure than a person with higher disclosure. It can be said that the online system and the CTCL rule are useful for the person who has many worries relatively.

Table VI shows the results about the fifteen categories of the self-disclosure assessment. The value of p indicates the test statistic with student's t-test of ESDQpre and ESDQsys. The scores of categories c03 and c07 were especially increased by using the conventional interface system. The student's t-test statistics of ESDQpre and ESDQsys are $p = 0.059$ and 0.063; thus, they met the significance level of 10% ($p < 0.1$). The categories c03 and c07 are "*intentional aspect of spiritual self*" and an "*informal interpersonal aspect of social self (same sex),*" respectively. We think that the results occurred because several categories have high relevance to the meeting theme. For this reason, to improve the self-disclosure of participants, it is important to provide an appropriate theme. In contrast, the category c15, which is about "*rumors,*" was not easy to be disclosed in the online system. That is a reasonable result because in the meeting, the participants spoke based on their own experiences and feelings. Further investigation is necessary to discuss the effect of self-disclosure for each category.

The result that there was no correlation between IAA and #words suggests that the participants with higher social anxiety did not speak much in the meeting despite having difficulties related to the meeting theme. However, there was a weak negative correlation in TL-Nodelay and RND-Nodelay, and there was no correlation in TL-Delay and RND-Delay (Table IV). From the results, when the participants with higher social anxiety use the Nodelay interfaces, they find it difficult to speak. In contrast, since the Delay interfaces have no such effect, they are suitable for all participants who have various degrees of social anxiety.

VI. IMPLICATION

The contents of the I-AA questionnaire administered before the experiment were included the meeting theme, which was about worries of interpersonal anxiety. As a result, it may have

TABLE III. MEAN AND STANDARD DEVIATION OF EACH DATA POINT FOR EACH CONDITION (N = 15).

| | TL-Nodelay | | TL-Delay | | RND-Nodelay | | RND-Delay | |
	M	SD	M	SD	M	SD	M	SD
IAA	2.97	0.96	3.21	0.74	2.99	1.00	3.32	0.79
ESDQpre	176.80	30.15	170.60	34.98	186.67	29.06	162.80	29.81
ESDQsys	189.13	21.93	183.53	30.39	173.73	25.01	158.20	22.63
dESDQsys	12.33	43.03	12.93	39.94	-12.93	48.39	-4.60	23.97
#words	97.73	35.63	123.47	59.34	121.80	44.00	103.80	41.65

TABLE VI. MEAN AND STANDARD DEVIATION OF THE FIFTEEN CATEGORIES OF THE SELF-DISCLOSURE IN TL-NODELAY (N = 15).

| | TL-Nodelay | | | | |
| | ESDQpre | | ESDQsys | | p |
	M	SD	M	SD	
c01	12.93	1.87	13.40	1.88	.509
c02	11.20	3.26	12.47	2.83	.360
c03	11.73	2.69	13.33	2.23	.059+
c04	11.13	3.18	12.33	2.41	.294
c05	12.53	2.23	13.07	2.22	.502
c06	8.07	3.49	7.53	3.23	.636
c07	11.80	2.68	13.53	1.81	.063+
c08	10.53	4.02	11.80	2.51	.350
c09	12.73	2.60	13.27	2.02	.508
c10	12.93	2.22	13.67	1.29	.326
c11	11.87	2.50	12.40	2.82	.569
c12	11.47	3.09	13.20	2.04	.159
c13	13.67	1.72	14.53	0.92	.155
c14	12.60	2.41	13.60	1.68	.221
c15	11.60	2.23	11.00	2.45	.591
total	176.80	30.15	189.13	21.93	.302

promoted speaking or improved self-disclosure of participants. It may have also biased the contents of speaking. However, conducting a questionnaire before a meeting for the participants to have a deeper consciousness about meeting themes may be useful. In the field of *tojisha-kenkyu*, there is room for consideration also in preparation for a meeting stage.

From the result, there is not necessarily a relationship between the degree of self-disclosure and the number of spoken words (Table II). The fact suggests that there is a gap between feeling and actually action. From the subjective viewpoint of a participant, it is a better environment where self-disclosure tends to be higher. On the other hand, from the objective viewpoint, it is better to have an active environment where many things are spoken by others. Both factors are important for constructing a better meeting environment for *tojisha-kenkyu*.

The result that the TL interfaces improve self-disclosure may be interpreted as RND deteriorates self-disclosure. In RND, there is a risk of participants lacking concentration in the meeting because the display position of the spoken text is not fixed. In contrast, it can be inferred that application of the CTCL rule or the CMC environment greatly contributed to improve self-disclosure. It is important to verify which factor is more important in some way, e.g., by conducting a meeting without the CTCL rule.

By comparing #words in TL-Nodelay, TL-Delay, and RND-Nodelay, both spatial and temporal rearrangements seem to have promoted speaking (Table III). However, #words are the same in RND-Delay and TL-Nodelay. Since there is no statistical difference anyway, the contribution of the interface to promote speaking in a meeting may be small.

If we want to just increase the number of spoken text in

a meeting environment, introducing a bot agent using logs of another meeting may be a solution. We are conducting research on the construction of such agents [13].

According to previous research, gender affects self-disclosure [14][15]. Specifically, females have higher self-disclosure than males. In fact, the degree of self-disclosure in the preliminary questionnaire tended to be higher in experimental groups with more women. Considering the result that the degree of self-disclosure in the usual living environment is the major factor contributing to the disclosure change in an online system, the system may be more effective for males.

VII. LIMITATION

This experiment was conducted as a part-time job for university students. It may be implicitly bringing confidence that the other participants are also in the same part-time job. The implicit assumption that the participants belong to a close community can also create security. It is undeniable that the sense of security and responsibility as an employee may have established the meetings online. It is necessary to investigate the influence of these two factors by application to the groups of tojisha-kenkyu or general population who are not part-time employees.

For the same reason, few spoken texts ignoring the meeting rule were observed. Therefore, similar verification is required for the relationship between interface and rule compliance.

Although we did not control the sex, such a control is necessary for more precise evaluation.

In order to make university students a *tojisha*, we adopted very general worries as a meeting theme. Since the difficulties of tojisha-kenkyu are not general, their meetings are more serious and useful.

The evaluation is based on the experimental result of only one meeting by the participants who used the rule and the system for the first time. As tojisha-kenkyu is continual in practice, the evaluation of the system by observations of a number of meetings is necessary.

This paper does not discuss the content of the meeting. It is interesting to study whether using the system essentially has an influence on tojisha-kenkyu.

We assumed that participants access the web-system from thier desktop or laptop PC in this experiment. It is desirable that the system can also be used in other devices such as smartphones so that a large number of people can participate. However, it is difficult to operate the RND interface when using it on a device with a small screen.

VIII. CONCLUSION AND FUTURE WORK

Tojisha-kenkyu is used to share difficulties that many participants cannot express well. In this research, to construct a

system to conduct CTCL meetings online, we investigated the effect of an online meeting with the CTCL rule. Concretely, we constructed four interfaces that are different from two viewpoints, spatial and temporal, and we examined the effect on the conventional interface and the relationship between the effects of the proposed interfaces. From the experimental results on undergraduate and graduate students, following findings were obtained:

- The degree of self-disclosure for unfamiliar people on the system is almost the same from the disclosure for the usual living environment. However, it is not only necessary to use an online system but also preferred to use a more familiar interface like TL.

- The degree of self-disclosure in the usual living environment is the major factor contributing to change the disclosure in the online system. The online system and the CTCL rule are more effective for a person with a lower disclosure than one with a higher disclosure.

- It is important to provide the appropriate theme to improve the self-disclosure of participants.

- The Delay interfaces are suitable for all participants who have various degrees of social anxiety.

As future work, it is necessary to investigate the influence of the sense of security and responsibility by application to the groups of *tojisha-kenkyu* or general population who are not part-time employees.

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