

The Impact of Avatar Customization Flexibility on Conversational Satisfaction

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Abstract

The use of the metaverse is becoming more widespread. Virtual space is believed to serve as a platform where young people with interpersonal concerns can gain confidence in their social participation. Ichino et al. have shown that self-disclosure is more likely when avatars do not resemble the user. However, a unique feature of the metaverse is the ability to communicate through an avatar of one's choice. In this study, we examined whether the level of conversation satisfaction in a virtual space differs when avatars are freely designed versus when they are not. The results suggest that participants who created their own avatars experienced an increase in conversation excitement.

Keywords: Avatar, freely design, Conversation, Metaverse

1 Introduction

Many of today's young people have difficulties in their relationships. According to a survey conducted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in 2022, there are approximately 300,000 students in elementary and junior high schools who do not attend school, the largest number ever [1]. The main reason for truancy is often problems in friendships and other relationships. Many elementary and junior high school students, as well as college students, struggle with interpersonal relationships. Horii [2] says, "The number of students who experience interpersonal anxiety (a condition in which a person has difficulty establishing interpersonal relationships primarily due to fear or anxiety) is on the rise. Since the onset of the COVID-19 pandemic in 2020, communication through videoconferencing services such as Zoom and Google Meet has become widespread in schools and workplaces. The psychological burden is expected to be reduced by eliminating the need to meet in person. However, even with video, people must communicate with their own faces. This is a psychological burden for young people who are anxious about interpersonal relationships. The use of the metaverse as an online communication tool has become widespread in recent years. Metaverse is a service that allows users to freely move their avatars (their alter egos) in the appearance of their choice and communicate with others in a world created in a virtual space on the Internet. Unlike video conferencing, the conversation is conducted through an avatar. Therefore, the psychological burden of engaging in dialogue is expected to be lower [3]. Furthermore, compared to chat and voice calls, conversations via avatars are rich in non-verbal communication other than words, such as tone of voice, voice inflection, facial expressions, eye contact, nodding, posture, gestures, and clothing. Kano [4] notes that it is possible to realize the self-one wants to be in virtual space, that it helps

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build confidence in social participation, and that it holds promise as a place to practice for students who cannot go to school. Even young people who cannot compensate for the gap between the self they want to be and the self they can become in the real world, and who are too shy to even greet their friends, will feel less anxiety and nervousness about communication if they communicate with an avatar who is a realization of the self they want to be in a virtual space. Furthermore, if they can experience the joy of communication there, it may lead to confidence in their participation in society.

Ichino et al. [5] tested the effect of avatar conversations on self-disclosure. They found that the avatar that did not look like them encouraged self-disclosure the most, followed by the avatar that looked like them, and then videoconferencing. Based on these results, it can be said that conversing with avatars without individuality leads to higher conversational satisfaction and the formation of trusting relationships. However, a unique feature of the metaverse is that users are free to create and communicate with avatars of their choice. Ichino et al. [5] did not allow subjects to create avatars in their experiment. Examining the motivation of college students, Shima et al. [6] found that “the ability to self-determine leads to increased motivation for that class. Similarly, in communication using avatars, we think that allowing users to freely design their own avatars will motivate them to engage in conversation, improve conversational satisfaction, and build trust with others.

In this study, we asked subjects to communicate with avatars they had created according to their own preferences and with featureless and uniform avatars that did not reflect their preferences. We examined their impressions of the other person, the liveliness of the conversation, and their level of satisfaction, with the goal of contributing to the reduction of interpersonal anxiety through avatar communication.

2 Methods

2.1 Subjects & Equipment used

Adult males and females (6 males and 6 females; mean age 22 years, SD 2.6) who agreed to participate in the experiment participated as subjects. Then, six pairs were randomly created from the subjects, each pair consisting of one male and one female. The six pairs were further divided into two groups: group A, in which the subjects were asked to create their own avatars (hereafter referred to as “design model”), and group B, in which the avatars prepared by the authors (hereafter referred to as “base model”) were used for the conversation. The subjects within each group did not know each other.

In this study, Vroid Studio (<https://vroid.com/studio>) was used to create avatars for the design model. The avatars were placed in a 3DCG room with chairs and a table on Cluster (<https://cluster.mu>). They were then uploaded to the platform, where they were positioned to face each other (Figure 1). Meta Quest 2 (<https://www.meta.com>), an HMD for VR, was used as the device for viewing the metaverse.

2.2 Experimental procedure

Subjects in both groups A and B participated in the experiment in different rooms, so they did not actually see each other before and during the experiment. The experimental procedure for groups A and B was as follows.

1. The subjects were placed in different rooms.

- 2A (Group A only). The subjects were told that they had to talk to each other’s avatars in the metaverse space, and the use of Vroid Studio was explained to them. Then each subject was asked to create his/her own avatar (about 30 minutes).
- 2B (Group B only). The subjects were shown the base model created by the author and were told that they would now talk to other base models.
- Group A was instructed to log into the room prepared on the cluster with the design model and Group B with the base model.
 - Two people were instructed to sit in chairs in the room and start talking.
 - The participants were allowed to follow the conversation with their avatars (about 15 minutes). After the conversation, each participant filled out a questionnaire.

Subjects in Group A were asked to create avatars freely in Procedure 2A. However, since the subjects were using Vroid for the first time, instead of having them create avatars from scratch, the authors prepared eight sample avatars in advance and asked them to choose one of them and then modify their faces and clothing (Figure 2). One of the authors was present during the creation of the avatar and provided support when problems arose. The avatar creation time was set at approximately 30 minutes. The base model for Group B was based on the avatar used in the Ichino et al. [5] study, with no hair, white t-shirt and black slacks for clothing, and gray skin (Figure 2), so that the avatar's hair, clothing, and skin color would be featureless. In step 6, the subjects did not know each other, so the authors presented a conversation topic. The conversation topics were “Introductions” (about 3 minutes), “Finding Common Ground” (about 5 minutes), in which the two participants were asked to list as many things they had in common as possible, and “Free Talk” (7 minutes). When the approximate time was up, a screen placed in the metaverse displayed instructions to move on to the next topic, and an audio notification was provided.



Figure 1: The room on Cluster



Figure 2: Avatar

2.3 Questionnaire

After the experiment, participants were asked to complete a questionnaire about their impression of the other person, degree of excitement of the conversation, and their satisfaction with the avatar conversation. The questionnaire used was the same one employed by Ushida et al. [7] in their study of intimacy levels and speech overlap in conversational contexts. The respective question items are shown in Tables 1, 2, and 3.

3 Results and Discussion

Table 1: Impression of the other party by the conversation

	Group A			Group B		
	Mean	Median	Max - Min	Mean	Median	Max - Min
personal friendliness						
good-natured - bad-natured	6.8	7	7 - 6	6.8	7	7 - 6
friendly - unfriendly	7.0	7	7 - 7	7.0	7	7 - 7
pleasant - unpleasant	6.8	7	7 - 6	6.8	7	7 - 6
social desirability						
irresponsible - responsible #	5.7	5.5	7 - 4	5.7	5.5	7 - 4
cautious - thoughtless	4.3	5	5 - 3	4.3	5	5 - 3
inconsiderate - sensible #	6.5	6.5	7 - 6	6.5	6.5	7 - 6
activity						
buoyant - somber	5.2	5	7 - 2	5.2	5	7 - 2
sociable - unsociable	6.0	6.5	7 - 3	6.0	6.5	7 - 3
passive - active #	5.7	6	6 - 5	5.7	6	6 - 5

The # in the table is an inverted item.

Table 2: Excitement level of the conversation

	Group A			Group B		
	Mean	Median	Max - Min	Mean	Median	Max - Min
I was absorbed in the conversation	7.3	7.5	8 - 6	6.2	6.5	8 - 4
The conversation was pleasant	8.0	8	8 - 8	6.0	6.5	8 - 3
The conversation did not go well #	6.3	7	8 - 3	4.5	5	6 - 1
The conversation was lively	7.5	8	8 - 6	5.8	6	7 - 5
The conversation was animated	7.3	8	8 - 6	6.0	6	8 - 5

The # in the table is an inverted item.

**: $p < .01$ *: $p < .05$

Table 3: Satisfaction with the conversation

	Group A			Group B		
	Mean	Median	Max - Min	Mean	Median	Max - Min
Conversation Adjustment						
I was able to coordinate the conversation well	6.5	6.5	8 - 5	5.8	6	8 - 4
The conversation was cooperative	7.5	7.5	8 - 7	6.8	6.5	8 - 6
Conversation Concentration						
I was able to have a pleasant conversation	7.8	8	8 - 7	7.2	7	8 - 6
We engaged in conversation with mutual interest	7.5	7.5	8 - 7	6.7	6.5	8 - 5
Stilted Conversation						
Stilted Conversation Factor #	5.2	6	7 - 2	4.7	5	8 - 1
The conversation was stilted #	5.3	5.5	6 - 4	3.2	3	5 - 2

The # in the table is an inverted item.

*: $p < .05$

Regarding the impressions of the partner (Table 1), the mean of Group A was higher than that of Group B on all items except the item “cautious - thoughtless”. However, when the Mann-Whitney U-test was performed, there were no significant differences between groups A and B on any item. Regarding the excitement level of the conversation (Table 2), the mean of group A exceeded the mean of group B on all items. Mann-Whitney's U test was performed for each item, and significant differences were found between group A and group B for the items “conversation was pleasant” ($U=3, z=2.68, p=0.007$), “conversation did not go well” ($U=5.5, z=2.06, p=0.04$), and “conversation was lively” ($U=3, z=2.50, p=0.012$). For satisfaction with the conversation

(Table 3), the mean for all items was also higher in Group A than in Group B. However, according to the results of the Mann-Whitney U-test, there was no significant difference between Group A and Group B, except for the item “The conversation was awkward” ($U=3$, $z=2.53$, $p=0.011$), which did show a significant difference. These results suggest that in avatar conversations, conversations are more likely to be lively when avatars are freely designed to one's liking (design model) than when prepared avatars are used (base model). The results also suggested that awkwardness in conversation might be reduced.

As for the fact that the design model showed more excitement in the conversation, one reason may be that the participants were more motivated and willing to have the conversation. According to Shima et al. [6], who studied learners' motivation for classes, for learners to be highly motivated, learners must be self-determined in their classes. Although this study was not conducted in a classroom setting, the fact that there was an element of self-determination in the situation of conversing with others, as in this study, may have contributed to the high motivation for conversation. In the free-text responses, some of the Group A responses were related to the avatar's appearance. Some respondents stated that the cuteness of the avatar increased their enjoyment of the conversation and that they felt more confident in the conversation after creating an avatar that looked cooler than their actual selves. Some respondents also said that they felt more comfortable in the virtual space. It is assumed that the reason for the lively conversation was that using avatars of one's own choice made the participants feel more comfortable in the virtual space and gave them confidence in their ability to converse. This may also indicate the importance of one's avatar preferences in “realizing the self-one wants to be,” as described by Kano [4], and that allowing one's avatar to be freely customized may be helpful in reducing interpersonal anxiety. On the other hand, some participants described not being able to understand the facial expressions of other avatars and worrying about whether their own avatar's facial expressions were being conveyed to other avatars. In an avatar-to-avatar conversation, less information is gleaned from facial expressions and reactions than in a face-to-face conversation. Cluster allows the user to express the avatar's emotions by pressing buttons, etc. However, this was the first time for the subjects to use Cluster and they were not familiar with the operation. Therefore, they were not able to change their facial expressions. Group B had no positive descriptions of the avatars. In addition, compared to Group A, there were more descriptions of how the lack of change in facial expressions made conversation difficult. In terms of “ease of speaking,” most of the Group A respondents answered positively that they were able to talk about themselves. Conversely, negative comments about only superficial conversations were found in Group B. It is assumed that the lack of a distinctive avatar made it difficult to grasp the nature of the person one was talking to, making the conversation superficial and exploratory. The fact that neither the design model nor the base model could detect changes in facial expression may have been the reason why there was no significant difference between the two in terms of their impressions of the other. In addition, the base model not only had no readable facial expressions, but also had no personality, which may have caused awkwardness in the conversation. In order to have a smooth conversation in a virtual space, it is better to have individual personalities, and the use of avatars with rich expressions will bring people closer to the self they want to be and further increase the satisfaction of the conversation. However, complex manipulation of devices is required to achieve rich emotional expression. As a result, smooth conversation may be hindered, and it will be important to find a balance between the two in the future. Alternatively, it would be necessary to develop a system that can easily capture facial expressions and reflect them on avatars.

Ichino et al. [5] found that avatars without a personality similar to the users' own personalities were more likely to self-disclose. In this study, they found that avatars designed to match the users' own preferences were more conducive to conversation. This suggests that the important

thing is not whether the avatar looks like the user, but whether it is the user's preferred avatar. However, because this study focused on satisfaction and other factors, self-disclosure was predicted only from free descriptions. Further research is needed to determine the extent to which self-disclosure occurs in conversations through avatars.

Although there were no significant differences, the only item in the questionnaire that was higher in Group B than in Group A was "cautious - thoughtless" in the "impression of the other party" section. This may be because the freedom to create avatars allowed for the expression of individuality, and the word "cautious" was less rigidly associated with the word.

One of the challenges of this study was the small number of participants. Although the comparison was made between couples who made avatars and those who did not, future studies are needed to examine the case where one couple made an avatar and the other did not, or where same-sex conversations take place. In addition, given that avatar communication is used to build confidence in social participation, further research is needed. By examining changes in the amount and degree of self-disclosure, as well as the subjective intimacy between participants, it would be possible to provide more concrete examples of how to support young people with interpersonal anxiety using metaverse and avatar.

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