

# Pseudo Physical Contact and Communication in VRChat: A Study with Survey Method in Japanese Users

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## Abstract

VRChat is one of social virtual reality platforms and getting popular. Pseudo physical contacts are used for communication in VRChat. We performed a questionnaire survey for VRChat users ( $N=341$ ) in Japan to take statistics of users and their avatars, and to investigate effects of pseudo physical contacts on interpersonal attractiveness and communication. Users were 87% male, 8% female, and 4% neutral genders in the real world, while their avatars were 4% male, 87% female, and 9% neutral. Participants answered that the interpersonal attractiveness increased and the communication difficulty decreased after pseudo physical contacts, suggesting that the pseudo physical contact may improve our social relationship without actual touch.

## CCS Concepts

• **Human-centered computing** → **Virtual reality**;

## 1. Introduction

Touch is one of important modalities for non-verbal communication. Especially, interpersonal touch contributes to emotional communication and well-being [GS10] [DNVE\*13]. Interpersonal touch improves communication and creating bonds in couples [GGS03], and boosts interpersonal attractiveness [BWB92].

It is expected that social touch is useful in human-computer interaction [VET15]. Touch-enabled virtual agents and human-robot collaboration may contribute to improving healthcare, well-being, and telepresence communication. Various touch devices have been developed for the purpose of social touch. For example, HapticHug is a haptic device on the chest for communication of hug over a distance in a three-dimensional virtual world Second Life [Tse10].

Effects of active touch and pseudo-haptic touch on a communication between human and virtual human has been investigated [KLPL09]. Kotranz et al. (2009) shows that bidirectional touch affords bidirectional nonverbal communication between human and a virtual human similar to that between two humans either with active touch and pseud-haptic touch.

Recently, VRChat is getting popular as a virtual reality social networking service. In VRChat, pseudo physical contacts using a head-mounted display (HMD) and motion controllers are used for communication in virtual environments; users touch each other with their avatars in the virtual environment while they do not feel touch in the real world. On the other hand, some users engage in disrespectful or harmful behavior. Society in VR must be safe and peaceful as well as in the real environment. We hypothesized that

the pseudo physical contacts could increase partner's attractiveness and improve communication impression. So the pseudo physical contacts might decrease disrespectful behavior. We aimed to take descriptive statistics of Japanese users' characteristics in VRChat, and to test the hypothesis of the effects of pseudo physical contacts on interpersonal attractiveness and communication impression.

## 2. Methods

### 2.1. Participants

We conducted a questionnaire survey using Google Forms during 21<sup>st</sup> June - 20<sup>th</sup> July 2019 (forms.gle/Yc7g841CqmgjsGEn7). Anonymous participants were recruited by SNS. All announcements and the questionnaire were written in Japanese. We obtained the data of 341 participants and 464 answers for partners.

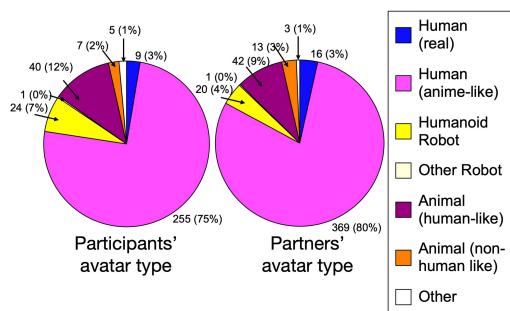
### 2.2. Questionnaire

The questionnaire started with items about users' personal attributions (real gender, avatar's gender, avatar type, avatar height, relative frequency of physical contacts in real and virtual environments). Then, participants were asked to suppose a partner, and answer the partner's attributions (avatar's gender, avatar type, avatar height), type of pseudo physical contacts, attractiveness (7 level Likert Scale) of each partner before and after the pseudo physical contacts, and communication impression (7 level Likert Scale) with each partner before and after the pseudo physical contacts. Participants could answer up to five partners.

### 3. Results

#### 3.1. Gender and avatar type

Results of the survey showed unbalanced distributions in genders of participants, their avatars, and partners' avatars. Male was 87%, female was 9%, and neutral (or Non-applicable) gender was 4% in the real gender of participants (N=341). However, their avatars' gender was 4% male, 87% female, and 9% neutral (N=464). Partners' avatar gender distribution was similar to the participants' avatar gender (8% male, 85% female, and 7% neutral). 88% of male participants used female avatars, while 10% of female participants used male avatars. Participants used anime-like human avatars (75%), human-like animal avatars (12%), humanoid avatars (7%), and others. Partners' avatar type distribution was similar to the participants (Figure 1).



**Figure 1:** Distribution of avatar types of participants (left) and partners (right).

#### 3.2. Type of pseudo physical contact and relative frequency of social physical contact

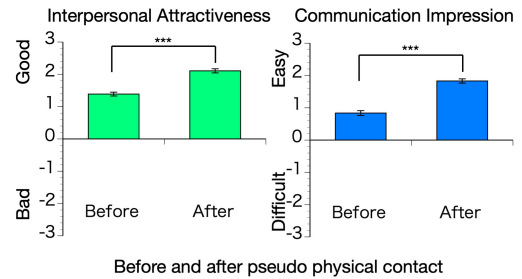
Participants had experiences of various pseudo physical contacts: patting the head (90%), stroking the cheek (75%), hug (54%), putting hands together (50%), putting foreheads together (39%), shaking hands (32%) and others. 93% of participants answered that the physical contacts were more often in the VRChat than the real environment.

#### 3.3. Interpersonal attractiveness and communication impression before and after pseudo physical contacts

We applied the Wilcoxon signed-rand test for interpersonal attractiveness and the communication impression (both 7-level Likert scale) to compare before and after the pseudo physical contacts (Figure 2). Thus, the VRChat users in our survey answered that the interpersonal attractiveness increased ( $V=3605$ ,  $p<.001$ ) and the communication became easy ( $V=3553$ ,  $p<.001$ ) after pseudo physical contacts.

### 4. Discussion and Conclusions

The Internet survey showed that more than 80% of Japanese users in VRChat were male, but most of them used female avatars. Anime-like human avatars were popular. They performed various pseudo physical contacts in the virtual environment, and the pseudo



**Figure 2:** Results of interpersonal impression (left) and communication impression (right). Error bars indicate SEM. \*\*\*  $p<.001$

physical contacts could improve the interpersonal attractiveness and communication impression in a virtual environment.

It is not clear why most Japanese male users use female anime avatars and interact with them. We speculate that Japan pop culture is one of reasons; Female animation/game characters are popular not only for children but also adults. Humans want to look like what they like, and VR enables it. We need a cross-cultural study in a future. The results suggest that the pseudo physical contacts maybe effective to improve communications without actual contacts or haptic sensations. This finding may contribute to maintaining society in VR safe and comfortable, and designing a communication method with social distancing. As a limitation, we should discount the conclusions because the participants might be aware of the research purpose and it might penetrate into their cognition. We need a controlled experiment in a future study.

### Acknowledgements

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