게임 콘텐츠, 산업, 마케팅

메타버스 취업 면접 훈련의 효과성에 있어 성별에 따른 이모지 역할 연구

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Examining the Role of Emoji and Gender during Job Interview Training within Metaverse

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요 약

　본 연구는 메타버스에서 진행한 취업 면접 훈련 상황에서, 성별에 따른 이모지 사용이 사용자 경험에 주는 영향을 연구하였다. 이를 위해 이모지 사용, 면접관 성별, 그리고 사용자 성별의 2 x 2 x 2 혼합설계 실험을 통해 사용자가 느낀 친밀감, 상호이해, 그리고 대화에의 집중도를 측정하였다. 실험 결과는 이모지의 사용이 보다 긍정적인 사용자 경험을 불러오는 것으로 나타났다. 이러한 결과는 가상현실의 환경에서 진행하는 훈련과정에서, 적절하게 사용한 이모지가 취업 면접 훈련자의 불안감을 감소시키고, 더욱 긍정적인 능력을 이끌 수 있다는 시사점을 제공한다.

ABSTRACT

　The current study investigated the effect of emoji use and gender on job interview training within virtual environment (VE). A 2 (emoji use: use vs. no use) x 2 (interviewee gender) x 2 (interviewer gender) mixed design experiment (N = 80) was conducted. The result shows that emoji may be implemented within VE to promote positive affect. Intimacy predicted better mutual understanding and higher attention. Practical implication is provided as using emoji in virtual environment can be utilized as a practice tool for job interviews, or for other potentially stressful social contexts.

1. Introduction

A job interview is an integral part of recruitment processes. While appropriate social skills are important in job interviews, adequate means to prepare for one seems to be limited, other than practicing face-to-face with others. As an alternative to the face-to-face method, past studies explored the possibility of conducting job interview practice sessions within virtual environment (VE)[1-3]. With the recent emergence of metaverse[Autors], utilizing VE for practical purposes is expected to gain popularity.

In general a task that is perceived to be more enjoyable, leads to higher attention and motivation[4]. This is particularly important for tasks that are stressful, since individuals may be overwhelmed by stress, resulting in lack of motivation. For social contexts, higher cognition of existence and interaction with others is related to better performance and more positive outcomes[5]. The strength of a social relationship does not simply mean sharing an environment, but rather cognitively and emotionally communicating with each other, and research has shown that not only verbal but also nonverbal cues are important in building positive social interaction[6].

Thus, the current study proposes to investigate an interview training system using metaverse, focusing on testing how the design characteristics of a metaverse can promote the perception of the interviewees' own performance. Specifically, we focus on the effectiveness of emoji use from the interviewer, which is expected to help the interviewee to feel closer to the interviewer, and eventually result in better perception of their own interview performance. Additionally, we explore the effect of gender and gender-pairs on the effectiveness of the metaverse training tool.

2. Literature Review

2.1 Metaverse and social presence

Metaverse is defined as an immersive media which provides a high potential for rich social experience (i.e., high in media richness), and provide means for economic activities[Authors]. Metaverse predominantly employ virtual environment to create the space where users can interact with each other for its immersiveness and richness in terms of information. VE is often defined by a particular set of technology, which includes computers, head-mount displays(HMDs), headphones, and motion sensors[7]. By treating VE as a mediated experience, VE is defined as an environment that is created by computers or other media, in which the user feels present [8]. And this feeling of presence is most simply defined as a sensation of "being there." [9]

Within the concept of presence, social presence pinpoints the social aspects of being together with another intellectual being within VE, and is defined as "a psychological state in which virtual (para-authentic or artificial) social actors are experienced as actual social actors in either sensory or nonsensory ways,"

[10] although the definition of social presence often vary among scholars.

A review on the concept of social presence [11] suggests that these different conceptualizations do not contradict each other, but exist rather because they point to different aspects of social presence. Specifically, some studies focus on the "copresence"[12, 13] or "colocation"[14], an awareness of another being within VE, while others focus on the psychological involvement, such as intimacy or mutual understanding[15].

The awareness of the other intelligent being within metaverse in the current study is deliberately designed to be equivalent throughout conditions, so that the effect of emoji use and gender pairing can be more pronounced. However, the psychological involvement dimension of social presence (i.e., intimacy and mutual understanding) is expected to differ among conditions.

Thus, rather than capturing the entirety of the concept of social presence, the current investigation focuses on the psychological involvements that is pertinent to the study design. Specifically, this study focuses on intimacy and mutual understanding within social presence. Intimacy here is defined as "directness and intensity of interaction between two entities" which conversational partners negotiate[16]. Mutual understanding is conceptualized as perceived similarity in emotions and attitudes.

2.2 Emoji use and Intimacy

Emoji is defined as "popular digital pictograms that can appear in text messages, emails, and on social media platforms."[17]

Emoji was envisioned as a set of simple pictorial characters that cover the entirety of human emotion[18]. Emoji is thought to function similarly as nonverbal cues within computer-mediated communications[19]. Although literature on the effect of using emoji within metaverse is rather scarce, some studies focus on developing emojis for VE[17, 20], acknowledging emoji's potential to convey emotion between users. And since the use of emoji increases intimacy between users[21], use of emoji during a metaverse interview is expected to promote the feeling of intimacy to the interviewee. Therefore, the following is hypothesized:

RQ1. What is the effect of emoji use on intimacy during job interview training within a metaverse?

H1. Interviewees feel closer to interviewers when the interviewer use emoji compared to when they do not use emoji.

2.3 Gender and intimacy

Previous research suggests that females are more likely to show intimacy in general, and this is more pronounced for same-gender pairs[22]. However, the effect of gender pairing (i.e., same-gender vs. mixed-gender) is found to be relatively muted or reversed within VE compared to real life[23]. For instance, while people are more likely to reveal intimacy in same-gender relationship in real life[22], they are more likely to show more intimacy during mixed-gender interactions within VE[23].

In the context of real-life job interviews, female interviewees are found to show more intimacy during job interviews, while gender

of the interviewer does not have a significant effect on showing intimacy, and for female interviewers, same-gender pairing are reported to produce greater openness[24]. Thus, female interviewees are predicted to feel more intimate, particularly against female interviewers, so, the following is hypothesized:

RQ2. What is the effect of gender on intimacy during job interview training within metaverse?

H2a. Female interviewees, compared to male interviewees, feel closer to interviewers.

H2b. Interviewees feel closer to female interviewers compared to male interviewers.

H2c. Interviewees in same-gender pair group feel closer to interviewers compared to those in mixed-gender pair group.

Additionally, because females tend to more easily interpret the meaning of emoji than males do[25], and male sender of an emoji is more likely to be positively perceived[26], interactions between gender factors and emoji are hypothesized:

H3a. Female interviewees are more likely to feel intimacy to the interviewer when emoji is used.

H3b. Male interviewers are more likely to provide feelings of intimacy to the interviewee when emoji is used.

## 2.4 Intimacy, mutual understanding, and attention

Social presence is thought to affect attention in interpersonal communication[27]. While intimacy is a quick emotional response to characteristics of a social interaction, mutual understanding is expected to be based on secondary appraisal by applying a theory of mind to the counterpart of the interaction[11]. Thus, intimacy is expected to affect mutual understanding. Together, the following hypotheses and model (Fig 1) are proposed:

RQ3. What is the relationship between intimacy, mutual understanding, attention, and evaluation for job interview training within metaverse?

H4. Higher intimacy predicts higher mutual understanding.

H5. Higher intimacy predicts higher attention to the interview.
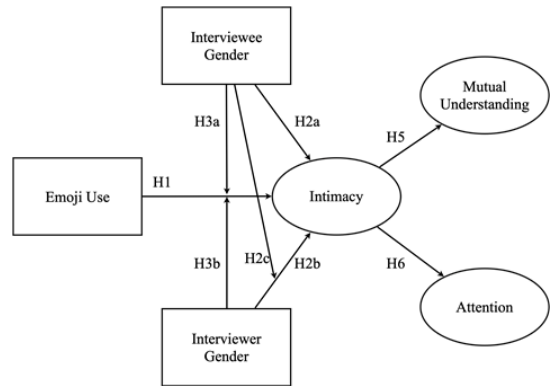
[Fig. 1] Theoretical model and hypotheses

3. Methods

A 2 × 2 × 2 mixed factorial design laboratory experiment was conducted, with gender of the participant (male vs. female) as a between-subjects factor, gender of the interviewer (male vs. female) as the another between-subjects factor, and emoji use as a within-subjects factor (emoji use vs. no emoji use by interviewer).

3.1 Participants

A sample of participants was recruited using flyers that were posted within a private university. The sample (N = 80) consisted of participants who identified themselves as male (n = 40) or female (n = 40). Participants' age ranged from 19 to 28 years (age M = 22.34, SD = 1.90). All of the participants were university students, and all procedures were approved by Institutional Review Board at BLINDED University.

3.2 Stimuli and apparatus

The stimulus material was created using VRchat by selecting a virtual venue and avatars of interviewers from VRchat assets that closely matched a job interview context. Specifically, a conference room, a male and a female avatar which had formal attire were selected. The interviewer avatars, emojis, and the conference room are depicted in Fig 2 and 3. Participants experienced the interview within VE through HMD using HTC Vive.

[Fig. 2] Male (left) and female (right) avatars.

[Fig. 3] Emojis that were used and the conference room.

3.3 Procedures

Twenty male and twenty female participants were randomly assigned to male or female interviewer group conditions. In male interviewer condition (n = 40), a male avatar that was voiced by a male researcher was used, while in female interviewer condition (n = 40), a female avatar was employed and was voiced by a female researcher. For the within condition of emoji use, each participant completed the job interview task twice, once with emoji and once without emoji in random order.

Participants were told that they will take part in an interview as a job applicant within a metaverse. Then, the participant entered the metaverse by putting the HMD on. Before the participant started the task, the participant's avatar was set up by the researcher so that it was seated in the interview room facing the interviewer across a conference table. The interview started after the researchers confirmed that the participant was ready to start the task. The voice and emoji use of the avatar of the interviewer was controlled by confederates who were in a separate room. A total of ten questions were asked to

participants per task, in random order. The interviewer asked participants questions that are typical to job interviews, including questions such as "what is your strength/weakness," and "what would you do if you have difference in opinion with others." During the treatment that incorporated emoji use, the interviewer used emojis when the interviewees were answering interview questions.

3.4 Measures

Intimacy was measured using three 5-point Likert-type scale items[28, 29]. Mutual understanding was measured using three 5-point Likert-type scale items[15, 29]. Measures to assess attention was created for this research, using three 5-point Likert-type scale items that directly asked if participants paid attention to the interview, the interviewer, the conversation with the interviewer, and the questions from the interviewer. Cronbach's alpha for measures is reported within results of RQ3 as it is an essential criterion in reporting the results of PLS-SEM (Partial Least Square Structural Equation Modelling).

4. Results

RQ1 and RQ2 questioned the effect of emoji use and gender composition of the interview on intimacy. A three-way mixed ANOVA was conducted to test the effect of emoji use and gender composition on the interview. The result showed that the effect of emoji use had a significant main effect on intimacy; $F(1, 79) = 9.32$, $p < .01$. Intimacy was higher when the interviewer used emoji ($M = 3.29$, $SD = 1.05$) compared to when they did not ($M = 2.52$, $SD = .82$). Therefore, H1 was supported. The main effect of interviewee gender had a significant effect on intimacy; $F(1, 79) = 6.60$, $p = .01$. Intimacy was higher for female ($M = 3.30$, $SD = 1.04$) compared to male ($M = 2.80$, $SD = .84$) participants. Therefore, H2a was supported. The main effect of interviewer was not significant; $F(1, 79) = .57$, $p = .45$. Therefore, H2b was not supported. No significant interaction between emoji and interviewee gender; $F(1, 79) = .03$, $p = .96$, emoji and interviewer gender; $F(1, 79) = .36$, $p = .54$, or gender pair $F(1, 79) = .36$, $p = .55$; was observed. Thus, H2c, H3a, and H3b were not supported.

PLS-SEM was conducted to investigate RQ3, which inquired the relationship between intimacy, mutual understanding, attention, and evaluation of the interview within VE. PLS-SEM was chosen over CB-SEM (Covariance Based Structural Equation Modelling) here since PLS-SEM is more applicable to smaller sample size, and suitable for research in exploratory nature. And since the experimental design included a within-subject factor, a subtraction between the two treatments (emoji use vs. no emoji use) was used for the analysis as done in previous studies, as in previous studies[Authors]. Rather than using fit indices, which tends to be exaggerated in PLS-SEM[30], the following indicators were investigated to test the hypotheses within RQ3 by applying recommended thresholds conservatively[30].

[Table 1] Factor loadings

Item	factor loading	item	factor loading
Intimacy 1	.809**	Attention 1	.785**
Intimacy 2	.911**	Attention 2	.885**
Intimacy 3	.827**	Attention 3	.866**
MU 1	.869**		
MU 2	.861**		
MU 3	.834**		

[Table 2] Cronbach's Alpha (α), CR, AVE of reflective constructs

Reflective Construct	α	CR	AVE
Intimacy	.817	.888	.723
MU	.817	.891	.731
Attention	.809	.883	.717

[Table 3] Path coefficients, T−statistics, and p−values within testing theoretical model

Paths	β	T−value	p
Intimacy −> Mutual understanding	.447	6.454	< .001
Intimacy −> Attention	.292	3.748	< .001

[Table 4] Variance inflation factors for items

Item	VIF	Item	VIF
Intimacy 1	1.917	Attention 1	1.741
Intimacy 2	1.916	Attention 2	1.967
Intimacy 3	1.667	Attention 3	1.675
MU 1	1.755		
MU 2	1.946		
MU 3	1.778		

[Table 5] Heterotrait−monotrait ratio for latent Constructs

Reflective Construct	1	2	3
1. Attention			
2. Intimacy	.302		
3. MU	.589	.507	

All reflective indicator loadings were significant (p < .001) and larger than the recommended threshold (>= .708) as in Table 1. Internal consistency reliability, which is assessed using Cronbach's alpha (>= .70) and composite reliability (CR; >= .70); and convergent validity, measured using average variance extracted (AVE; >=. 50), for all four latent variables were above the recommended threshold as in Table 2. Collinearity, which was assessed using variance inflation factor (VIF), was in ideal range (< 3) as well, as demonstrated in Table 4. The discriminant validity (heterotrait−monotrait ratio; HTMT) of latent variables was below recommended range (< .85). Results for HTMT are demonstrated in Table 5. Since the indicators satisfied required thresholds, we decided that the hypotheses within the model were ready to be tested.

Higher intimacy significantly predicted greater mutual understanding (β = .440, p < .001), and greater attention (β = .274, p < .001). Thus, H4 and H5 were supported. Together, the model explained mutual understanding of the interview to a moderate extent (R^2 = .189), and the attention weakly (R^2 = .073). Fig 4 depicts the model that yielded significant support for the proposed hypotheses.
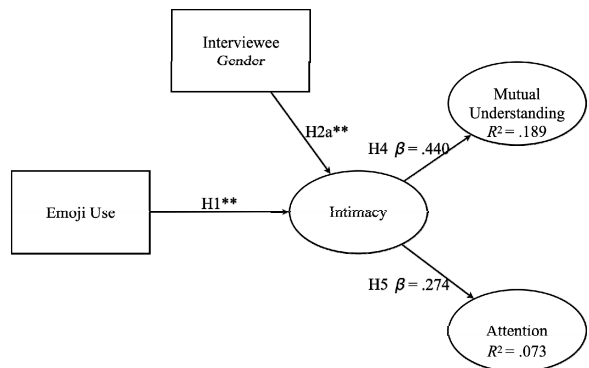
[Fig. 4] Final model with results

5. Discussion

This study explored the effect of emoji use and gender on the perception of interviewee's own performance in training sessions for job interviews within metaverse.

The prediction in this study was widely supported. Emoji use by interviewers significantly improved the participants' intimacy towards the interviewer, as expected. Indeed, job applicants are unlikely to witness emoji use in real-life job interviews. However, this result suggests that emoji may function as a tool that improve impressions during stressful experience during the virtual experience.

The effect of gender was tested as previous studies on real life interviews found significant effect of interviewer and interviewee gender on job interview performances. However, contrary to our prediction, gender of the interviewer, and gender pairing did not have significant effect on intimacy. We suspect that this is possibly because gender pairing effect, and the effect of other social entity's gender tends to be dampened within VE, as reviewed above. While other gender effects were not significant, the effect of interviewee gender on intimacy was significant. One explanation for this is that the effect of interviewee gender was simply stronger than other gender effects, assuming that gender effects were muted within metaverse. Another explanation for this is that the result may have been affected by how different genders perceive presence differently[31].

The PLS model results showed that greater intimacy led to higher sense of mutual understanding, and better attention to the social interaction. Together, the model which was proposed in this study moderately explained the divergent aspects of social presence. Results from the PLS model revealed convergent and discriminant validity between intimacy and mutual understanding. This result provides empirical evidence that these sub-constructs of social presence are indeed distinct, which had been mostly posited theoretically in earlier studies.

While providing better realism within VE is thought to be optimal in general, findings in the current study suggests that providing cues, albeit unrealistic in real life setting, may play an important role in better preparing job applicants for interviews by enhancing social presence of the virtual experience. The findings in this study is distinctive in that we found the effectiveness of a system can be improved not only by technological fidelity (e.g., shorter latency, or better graphics) but also by promoting nonverbal social cues within metaverse.

This study had a few aspects that might limit the generalizability of the findings. First, all the measures that was used in this study was self-reported. However, some of the constructs in this study, for example attention, might have been better assessed using more direct measures such as eye-tracking. Second, the experimental setting implies that the findings of the study should be confined within the context of the design. That is, other unaccounted effects from the stimuli using specific assets from VRchat might have affected participants' perception. Thus, future

study should attempt to replicate the results from this study using different stimuli.

In the future, we would like to further extend the findings of this study in different domains of training people for stressful social interactions. We would also like to study other technological aspects that could promote the effectiveness of using metaverse for training purposes.

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