How different virtual reality environments influence job interview anxiety

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Interviewing in a virtual reality environment has become a popular remote recruiting method, which not only reduces interviewer costs but also mitigates discrimination issues. Conducting interviews in virtual reality offers a wide range of environmental choices, such as room scenes, the appearance of the participants, and even the voice that can be adjusted according to needs. Specific configurations can have the additional effect of reducing negative interviewee emotions such as anxiety. This study will analyze how different virtual reality interview scenarios affect interviewees' anxiety levels.

Additional Key Words and Phrases: Virtual reality, Job interview anxiety, Virtual environments

1 INTRODUCTION

Anxiety arising from job interviews is a common form of social anxiety, especially for graduates leaving universities and looking for their first job, which often profoundly impacts their careers [1]. Rather than stepping into the workplace unprepared, seeking a virtual interview that is "real" enough to provoke anxiety can provide them with valuable experience and lessen the burden on job market attendants.

Existing research shows an inverted U-shaped relationship between performance and anxiety levels [2]. A moderate amount of anxiety can motivate people and improve their performance during the interview process. In the virtual interview of this study, adjusting the amount of anxiety is achieved by changing the job interview environment. Potential environment parameters include:

Music. In a study aimed at reducing anxiety among patients in healthcare waiting areas, researchers used strategies such as music, aromatherapy, and the introduction of natural elements. They concluded that music is a proven way to reduce anxiety among adult patients [3].

Lighting and Texture. In a study of interior design options for ambulatory care facilities that reduce patient stress and anxiety, researchers concluded that warm-toned lighting creates a warm, caring, friendly space. In addition, the use of different textures such as wallcovering and wood details adds comfort and interest to the environment. Both of these interior design parameters had a positive effect on reducing anxiety [4].

The interviewer's attire. In a study of the effect of experimenter dress on participant compliance, it was found that participants who received instructions from an experimenter who was dressed casually were found to be more compliant. The authors believe that the reason for this outcome is that participants felt less anxious about participating in the study due to the actors' casual attire, which helped participants follow instructions more closely [5].

In order to make these environmental parameters better manipulated and the simulated interview more realistic, this study uses virtual reality(VR) to provide different interview scenarios. Virtual reality technology combines visual displays, body tracking, real-time graphics, and other sensory input devices to create an immersive virtual environment that can simulate anxiety-inducing conditions [6]. This idea was inspired by virtual reality exposure therapy, which takes advantage of the above properties of VR technology to expose patients to simulated situations that can trigger anxiety in a controlled manner, interacting with harmless virtual stimuli to reduce fear response [7].

In the subsequent chapters, we will present findings from other research on VR job interviews and more cases of using VR to overcome social anxiety. What followed is a description of the controlled experiment conducted in this study, namely simulated job interviews in which the aforementioned environmental parameter settings were changed in different interview scenarios. We used a scale survey to quantify the level of anxiety experienced by participants, combined with participants' physiological data collected during the simulated interview and responses to a simple open-ended question after the experiment. In the end, the above three types of analysis results were integrated to explore the causal relationship between different virtual environments and individual anxiety levels in job interview simulation.

2 RELATED WORK

2.1 Virtual reality for job interviews

Today, many companies are already using VR technology for remote recruiting [8], as well as companies using VR technology for job interview training [9]. In a study using VR to train students with severe mental illness or autism spectrum disorder for job interviews, researchers evaluated 79 students' chances of getting a job after training. They found that VR job interview training improved the trainees' interviewing skills that contributed to receiving a competitive job offer [10]. In a study on the effects of virtual reality on job interviews, researchers found that the concept of using VR for job interviews enjoys high acceptance within the tested demographic, of which the majority prefers future interviews to be conducted in VR instead of traditional face-to-face conversations [11]. The VR simulated interview strikes a balance between interaction, immersion, and imagination, significantly improving the user experience

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[12]. On top of that, many candidates have felt discriminated against in previous interviews based on their race, gender, and age, and interviewing in a VR environment can avoid these bias issues [11].

However, the lack of direct face-to-face contact could limit the use of VR technology in job interviews. Research has shown that a certain degree of participants welcomes this reduction in face-to-face contact, finding interviewing in a VR environment more comfortable and less judged. While others argue that traditional face-to-face interviews are preferred because that help gauge the interviewer's non-verbal responses, a VR environment that lacks non-verbal feedback can make discussions with recruiters difficult [11].

In another study of eyestrain impacts on a training job interview in virtual reality, researchers found that using a VR headset accumulated significantly higher rates of eyestrain than using a computer screen, which tends to harm learning performance. In the experimental setting of the study, limiting VR device usage to less than 30 minutes resulted in a more effective learning curve for the subjects [13].

Another problem with VR is the massive hardware requirements and the attendant cost. The price of VR equipment is one of the obstacles preventing the technology from entering mainstream use [11, 14]. In order to improve the imaging effect of the headset, it is often necessary to connect a high-end computer with an excellent graphics card and processor so that the computer can render the VR scene in real-time and transmit the image back to the display.

2.2 Virtual reality exposure therapy

The use of virtual reality as a therapeutic tool, also known as virtual reality exposure therapy (VRET), has been effective in assisting people who experience social anxiety [15]. For example, patients are asked to take a sizable virtual spider with tactile feedback when treating arachnophobia. Patients still feel the same intense anxiety as holding a real spider, even if it is not a real spider. Many patients have significantly reduced their fear of spiders through repeated exposure treatments [16]. In another study, virtual scenes with a large audience were faked by altering the subjects' sight and hearing to treat public speaking fears. After five weeks of exposure therapy, subjects' public speaking anxiety reduced significantly [17]. In conclusion, research on VRET has demonstrated its efficacy in treating acrophobia, fear of flying, and fear of spiders. There has been some promising research on other anxiety disorders, including claustrophobia (fear of narrow areas), agoraphobia (panic disorder), social phobia, and post-traumatic stress disorder [18].

However, there is a risk associated with using VRET, which is motion sickness. Research has shown that predicting an individual's susceptibility to motion sickness is challenging, but some fundamental factors can help lessen the effects of a specific virtual environment [19]. Motion sickness can be significantly impacted by image lag, which is the responsiveness of the displayed image to head motion. Another study discovered that an image update lag of just 48 milliseconds could make people queasy [20].

3 METHODS OF RESEARCH

3.1 Research question and experiment design

Although similar studies exist evaluating how different levels of realism (by varying the virtual interviewer's appearance style to alter the sense of realism in virtual reality) affect job interview anxiety [1], unanswered questions still exist regarding how the different virtual environments and the individual's anxiety levels correlate in a job interview simulation. The following research questions (RQ) were proposed for the present research:

RQ: How does the individual's anxiety vary in relation to differing virtual reality environments in a job interview simulation?

Proceeding from this research question, we designed two scenarios of simulated job interviews with the aforementioned environmental parameters associated with anxiety levels as variables.

Scene 1 is a casual cafe scene with warm lighting, many texture elements (wallcovering, carpet, dining table with wooden details), soothing music playing in the background, and a virtual interviewer dressed casually.

Scene 2 is a traditional formal office that uses cool lights. Contrary to Scene 1, the interior design has no texture elements. Also, no background music is played in the scene, and the virtual interviewer is wearing a formal suit.

Based on previous work, Taken together with the link between environmental parameters and anxiety, the present study proposed Hypothesis:

Hypothesis: Interviewees who conducted VR simulated job interviews in the casual cafe scene experienced lower anxiety levels than those in the traditional office scene.

Participants were divided into two groups. Each group performed one experiment condition: one group performed simulated interviews in Scenario 1, and the other performed in Scenario 2. In order to measure the participants' anxiety levels, their physiological indicator (galvanic skin response) was monitored during the experiment, and the entire simulated interview process was recorded. After the experiment, participants filled out a scale survey(Measure of Anxiety in Selection Interviews) and answered an open-ended question. Please refer to the following section 3.3 Measures for details about the above three methods. The experiment adopted a between-group design to minimize the learning effects across conditions(experience in interviewing and avoiding answering the same interview questions).

3.2 Experiment Set-Up

Participants conducted simulated interviews in VR using a Meta /Oculus Quest 2 and wore an Empatica E4 wristband to collect physiological data. In addition, this research selected the software VR Chat to present two interview scenarios. VR Chat is an online virtual world platform that allows users to find or construct virtual scenes, enabling people to interact with others through user-created 3D avatars and virtual worlds.

Based on the requirements of the experiment design, we constructed a cafe scene(virtual world) in VRchat(see Figure 1). The

Fig. 1. VRChat Cafe scene

interior design of the scene has the required environmental parameters (warm lighting, rich texture elements), the virtual interviewer wears a casual t-shirt, and soothing background music is playing all the time. The office scene we selected (see Figure 2) also meets the requirements of the previous experimental design in terms of interior design (cool-toned lighting, no texture elements), the virtual interviewer is dressed formally, and no background music is played.

Fig. 2. VRChat Office scene

3.3 Measures

3.3.1 Physiological data. In a study on the characteristics of galvanic skin response(GSR) in anxiety states, the researchers compared the galvanic skin responses of 20 anxiety state patients with 20 normal subjects to stimuli that can provoke anxiety and found that patients with anxiety states had more skin conductance fluctuations [21]. Based on the conclusions of this study, the galvanic skin response was selected to reflect changes in participants' anxiety levels.

After obtaining some data, an expert was consulted to see if the recorded GSR data was suitable for further analysis. Expert opinion is that the increase in the recorded galvanic skin response is not valid evidence because the recorded body temperature data and the galvanic skin response were simultaneously elevated. The expert also suggests that by comparing two datasets (breathing exercise and simulated interview galvanic skin response) of each participant, it is expected to find characteristic differences in the changes in anxiety levels for each participant. (dr.ir.Randy Klaassen, Personal interview, May 19, 2022).

The breathing exercise involves gently inhaling through the nose and closing the mouth for a count of six seconds. Then exhale for another six seconds, let the breath slowly leave the body, and repeat the above breathing process for up to 10 minutes. A Study has shown that this method effectively reduces diastolic blood pressure and anxiety level [22] and thus can be used to obtain galvanic skin response baseline data for each participant and compare it with subsequent simulated interviews.

3.3.2 Scale design. The scale used in this experiment is based on an existing multidimensional measure of interview anxiety scale, called the measure of Anxiety in Selection Interviews(MASI) [23]. According to the actual situation of this experiment(Subjects do not need to consider their appearance), the questions of two dimensions in the scale were selected:

(1) **Communication**: The subject's response in the communication with the interviewer: whether the language organization is affected, whether the comprehension is affected, etc.

sample items from the dimension:

I become so apprehensive in job interviews that I am unable to express my thoughts clearly.

I get so anxious while taking job interviews that I have trouble answering questions that I know.

(2) **Behavioral**: Subject's behavior and physiological response: refers to the response of the individual's own body when facing the external stimulus, such as sweating, fidgeting, rapid heartbeat, etc.

sample items from the dimension:

Job interviews often make me perspire (e.g., sweaty palms and underarms).

My mouth gets very dry during job interviews.

Scoring standard of the scale: Each item of the scale is presented in the form of a self-reported scale. When answering, the subjects were asked to make the choice that best suited their actual situation when filling out the questionnaire. Items are rated on a 5-point response scale: 1 = strongly disagree, 2 = disagree, 3 = feel neutral, 4 = agree, 5 = strongly agree. The higher the total score of the scale, the higher the interview anxiety level. The dimensions and item distribution of the scale are shown in Table 1.

Table 1. Dimensions and item distribution of the interview anxiety scale

Dimensions	Number of items	Question index
Communication	6	1. 2. 3. 4. 5. 6
Behavioral	6	7. 8. 9. 10. 11. 12

3.3.3 Open-ended question and qualitative research. In order to shorten the duration of each experiment and reduce the burden on the participants, only one simple open-ended question and two follow-up questions were conducted after each experiment.

The Open-ended question was: How did you feel about the VR simulated interview you just concluded? If participants mentioned anxiety, the followed-up question was: Why do you feel anxious? If participants did not mention anxiety, the followed-up question was: Why do you not feel anxious?

After the participants responded, the researchers wrote a memo to collect the data. At the end of this research, we employ a grounded theory approach to analyze the collected data qualitatively. First, based on open-ended questions, we determined that the initial research question for the grounded theory approach was what are the anxiety-provoking and anxiety-reducing factors participants believed. The individual transcript was firstly broken into the excerpt, and by comparing excerpts between different people, excerpts representing the same concept were combined into codes. Finally, the correlated codes were grouped into themes and evaluated.

In using the grounded approach, this study used Delve, a software that facilitates qualitative data analysis [24].

3.4 Experiment process

Participants received an information letter and a consent form two days before the experiment, which informed them more about the content and precautions of this research. Each participant experimented individually at the appointed time. First, the participants with no experience using VR equipment received a certain amount of teaching to learning how to operate it. Then the participants put on the E4 wristband and performed breathing exercises for 10 minutes as the baseline data.

Subsequently, to avoid the influence of body temperature on the galvanic skin response data, the participants took off the E4 wristband and moved freely. After 10 minutes, the participants again put on the E4 wristband and VR headset to enter the predetermined scene and sat in the seat facing the virtual interviewer. At this time, the interviewer played the pre-recording questions(see Table 2) to start the interview, and the researcher began video recording the simulated interview in VR Chat. Participants answered the interview questions orally through the microphone of the VR headset after the questions were asked, with a time limit of 60 seconds for each question. If the participants timed out when answering the question, in order to interrupt their answer, breaking-off expressions were implemented (playing the pre-recorded audio: "Ok, I am going to the next question")

After completing the interview, participants were asked how they felt about interviewing in a VR environment, received the MASI scale, and finished it on the spot. Due to erroneously wearing the wristband, only one participant's physiological data became unavailable.

This experiment uses a virtual interviewer instead of a live performance by a human to eliminate the differences caused by the interviewer, considering that the interviewer played by a human may have differences in body movements and voice intonation in each experiment, so a pre-recorded virtual interviewer was used to ensure that all participants received the same information from the interviewer.

Because no assumption was made about what type of job the participants were applying for, the 12 questions used in the simulated interview were generic and typical job interview questions. In this experiment, interview questions were used as an essential method to stimulate the subjects' anxiety. When faced with difficult questions, the subjects may have anxiety-related reactions, and the correlated responses are expected to be found by analyzing physiological data and the recorded answer to the open-ended question.

Table 2. Job interview questions

No.	Question
1	Please tell me about yourself
2	What have you most enjoyed about being at university?
3	Tell me what is your strength.
4	How will your greatest strength help you perform?
5	where do you see yourself, in next five years?
6	Tell me what does success mean to you
7	Can you work well under pressure?
8	What is your greatest weakness?
9	How do your make important decisions?
10	Tell me about a time you work on a problem in a team.
11	Tell me about a time you made a mistake and overcame it.
12	And what did you learn from the experience?

3.5 Demographic

Twenty-one undergraduate and postgraduate students from the University of Twente participated in this experiment. All subjects are between 20-25 years old, studying Information technology-related majors, and have no formal job interview experience. Most of them have experience using VR equipment. Data of twenty subjects were eventually retained as one subject's physiological data was not available. The demographic table of the subjects is shown in the Table 3.

Table 3. Demographic data of the experiment participants

Sample category	undergraduate	postgraduate	total
male	15	3	18
female	0	2	2
total	15	5	20

4 RESULTS

Since the scale used in this study partially excerpts from the existing mature scale, reliability and validity tests were carried out first.

4.1 Reliability analysis

Reliability is an estimate of the degree of consistency in the results of a scale, and reliability indicates the stability and trustworthiness of a scale's measurements [25]. The method of reliability test in the study is to use SPSS software to conduct a homogeneity reliability test(alpha coefficient and split-half reliability).

Since no reverse scoring items were used in the scale, all 12 items were tested for reliability. For all items, high scores indicated

higher anxiety levels. From this, it can be inferred that all items have internal consistency.

The reliability test results of the scale are shown in Table 4.

Table 4. Reliability test results of the interview anxiety scale

N of items	Cronbach's alpha	Split-Half Coefficient
12	0.966	0.913

A reliability coefficient of 0.7 or higher is considered "acceptable" in most psychometrics. The test results show that the scale's Cronbach's Alpha is 0.966, and the split-half coefficient is 0.913, indicating that this scale has good internal consistency.

4.2 Validity analysis

The construct validity calculation method used here is: first, using the software SPSS Amos to construct a theoretical model, then the model of factor analysis is verified, and the fit of the model measures the construct validity of the scale. The structural equation model diagram constructed using Amos is shown in Figure 3.

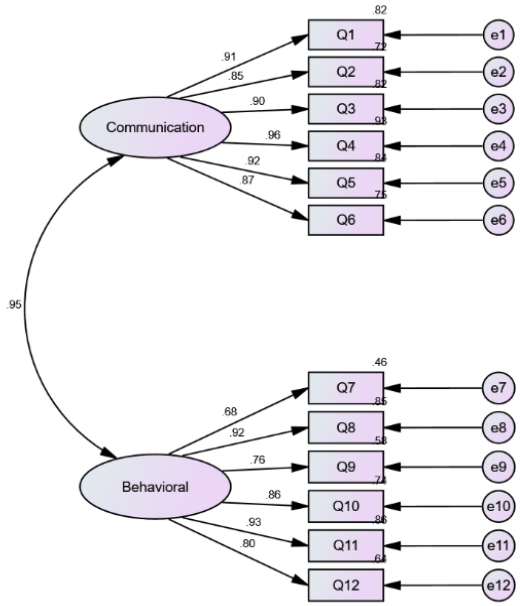

Fig. 3. Structural equation model of the interview anxiety scale

Structural equation fit indices are shown in Table 5.

Table 5. The calculation results of the structural equation of the interview anxiety scale

fit indices	CMIN/DF	RMSEA	RMR	CFI	NFI
results	1.704	0.03	0.035	0.868	0.902

CMIN/DF represents the difference of the smallest sample divided by the degrees of freedom, also called normative chi-square or relative chi-square. When its value exceeds 3, the model needs to be rejected by conservative criteria. According to the calculation results, the model is acceptable. RMSEA stands for approximate root mean square error and is a parsimony-adjusted index. When it is close to 0 indicates a good fit. RMR represents the square root of the difference between the residuals of the sample covariance matrix and the hypothesized model. And the smaller the value, the better the fit of the model. In this model, RMR=0.035 indicates a good fit. CFI is a comparative fit index, and its range is 0<CFI<1, when it is close to 1, the model fits very well. NFI is the normative fit index, and its variation range is 0<NFI<1. When NFI=1, it is completely fitted. When NFI is less than 0.9, the model needs to be reset. According to all the above evaluation criteria, it can be seen from the calculation results that the model fits well.

4.3 Physiological data analysis

A total of 20 sets of galvanic skin response data were collected. Each data set included each participant's breathing exercise baseline data and simulated interview data. Based on the theory mentioned in Section 3.31 that anxiety causes more fluctuations in galvanic skin response, we compared baseline data and simulated interview data for each participant. The galvanic skin response data of the two groups were also compared.

All participants' galvanic skin response data displayed an increasing trend in both the breathing exercises and the simulated interviews. The increased temperature of participants' wrists caused by wearing the E4 wristband for a long time is an objective factor leading to the rise of the galvanic skin response. It is worth noting that the increase rate of GSR value tends to be 1.5-3 times higher during the simulated interviews than during the breathing exercise. Assuming the temperature increase is the only factor causing the growth in the galvanic skin response, there should be no before-and-after distinctions in the rate of GSR increase for each participant. After completing the breathing exercises, the E4 wristband was put away by the participants for 10 minutes. Therefore, the elevated temperature did not affect the subsequent experimental data. The accelerometer data recorded by the E4 wristband showed no significant movement for all participants as the participants remained seated throughout the experiment. We inferred that there must be some other factors causing the galvanic skin response to increasing faster during simulated interviews.

Here we take the data of two participants in group 2 for illustration. Since the two participants' breathing training duration is very close to the duration of the simulated interview, comparing the GSR growth rate is convenient. The first baseline data showed a steady increase in galvanic skin response and plateaued around 0.58 (see Figure 4), and the participant's galvanic skin response experienced multiple significant fluctuations during the simulated interview, eventually increasing to over 0.94 (see Figure 5). It can be seen that the simulated interview resulted in a faster increase in the participant's GSR data. When comparing recorded videos of simulated interviews, it was found that several distinct fluctuations corresponded one-to-one with the time participants received

specific interview questions. When asked questions 3, 5, and 6, the subject paused to think for a long time. When the virtual interviewer asked question 8, the subject asked the interviewer to repeat the question and was interrupted by the virtual interviewer because of time out in answering the question.

Fig. 4. Baseline 1

Fig. 5. Physiological data 1

The baseline data of the second participant also showed a steady growth trend, finally reaching 0.32 (see Figure 6). In the subsequent simulated interview, it can be seen from the galvanic skin response data of the participant that there are many apparent fluctuations while the overall trend is rising, and finally reaches about 0.77 (see Figure 7). It can also be concluded that the participant's GSR growth rate during the simulated interview is higher than that of breathing exercise. By comparing the recorded video, it was also found that the fluctuations correspond to specific events. For example, the participant repeatedly asked the interviewer to repeat the 3rd question because he did not hear the question clearly, and when question 5 was asked, he paused to think for a long time and was interrupted by the virtual interviewer due to time out. The subjects' galvanic skin response dropped sharply before question 7, and the participant later explained that the position of the E4 wristband was adjusted then, resulting in irregular changes in the data. When the participant tried to answer question 10, he paused for a long time and expressed his wish to skip this question, and corresponding noticeable fluctuations could be seen in the galvanic skin response data.

Fig. 6. Baseline 2

Fig. 7. Physiological data 2

When comparing the galvanic skin response data of the two groups of participants who had simulated interviews in different VR scenarios, we did not find any characteristic showing the distinctions between the two data sets.

4.4 Scale data analysis

The participants' anxiety level was quantified in the experiment using the MASI scale. In order to analyze the difference between the results of the two groups, a preliminary statistical analysis was carried out on the collected data, shown in Table 6. The MASI scale score ranges from 1 to 5 points. The higher the score, the higher the anxiety level. Each subject's scale results were divided into two parts according to different question dimensions, and then the average score of the five questions in each dimension was used as an Experiment participants' scores on one dimension were counted, so each group had 20 sets of data. Next, the two groups of data in each dimension will be analyzed separately.

Although the sample size of 20 is not large, skewness and kurtosis values show that the data are close to a normal distribution. So we can use the two-sample Z test for each of the dimensions separately to analyze whether there is a significant difference between the two data groups. The null hypothesis H0 is defined as the anxiety level data measured in the first group did not differ from the data in the second group($\mu 1 - \mu 2 = 0$). The alternative hypothesis is that the measured anxiety level data in the first group differs from the data in the second group ($\mu 1 - \mu 2 \neq 0$). At a 95% confidence level (Confidence levels range from 80% to 99%, with the most common confidence level being 95% [26]), The results of the two-sample Z-test for both dimensions showed p-value < 0.001, which is approximately zero, indicating that H0 has been rejected. Therefore, the difference between the measured anxiety level data in the first group and the data in the second group is large enough to be statistically significant.

Table 6. Scale data preliminary analysis

V1		Dimension1	Dimension2
Group1	mean	2.0660	1.9340
	N	10	10
	Std. Deviation	.53953	.46546
	Skewness	-.472	-.013
	Kurtosis	.390	-1.098
Group2	mean	3.1480	2.7310
	N	10	10
	Std. Deviation	.86566	.55308
	Skewness	.161	-.288
	Kurtosis	-1.427	.366

In addition, the difference in the distribution of scores in the two dimensions between the two data groups can be better seen from the box plot (see Figure 8), and more participants from the office group tend to have higher anxiety scores given on the communication dimension. On the behavioral dimension, the difference in the distribution of scores between the two groups was minor, but the office group was still higher.

It can also be seen from the histogram that participants in the office group gave higher anxiety scores (see Figure 9).

The results of the data analysis showed that people in group 2 (the simulated interview conducted in an office scene) experienced higher levels of anxiety.

4.5 Qualitative data analysis

In conducting the grounded theory approach to generalize the data, we noticed that participants in Group 1 frequently responded around

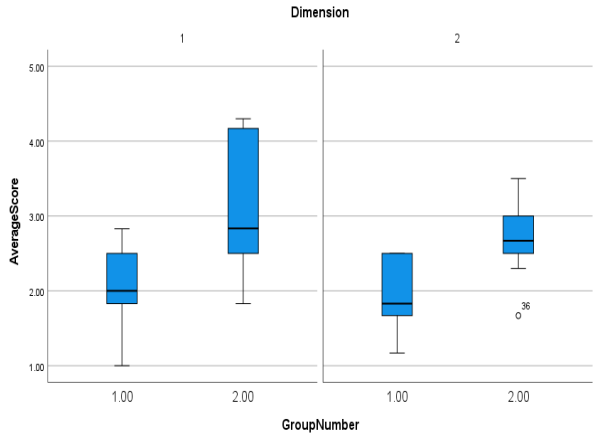

Fig. 8. Distribution of anxiety level

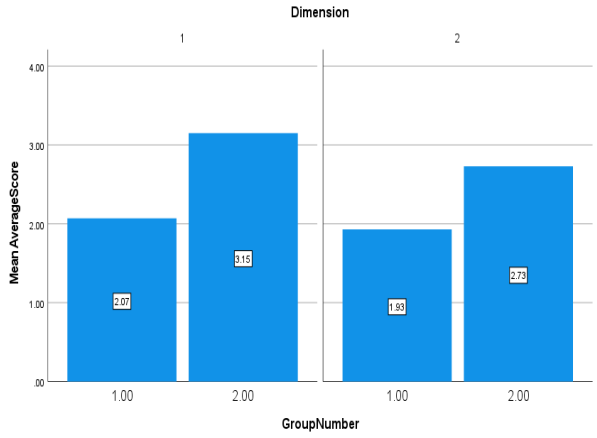

Fig. 9. Histogram of anxiety level

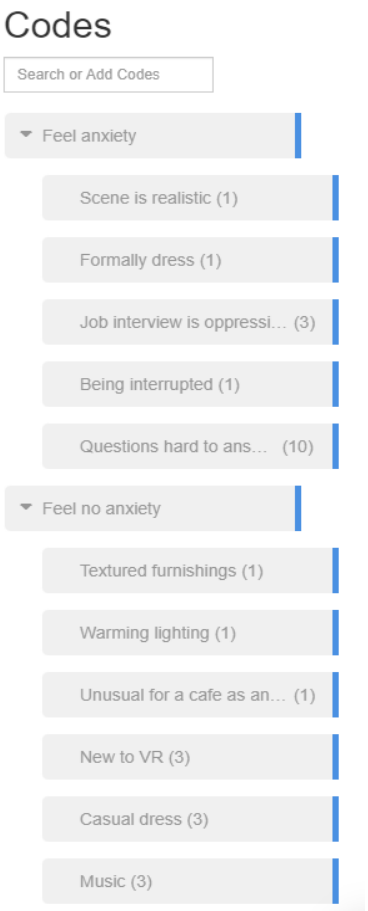

Fig. 10. Themes and codes

environmental parameters in the scenario. One participant from group 1 mentioned that the soothing music played in the cafe scene had a relaxing effect. Another participant in group 1 said that the interviewer was dressed casually in the cafe scene, making him not feel like he was doing a job interview, so he did not feel any pressure from the interview sense in the beginning. While participants in group 2 barely mentioned the environmental elements in the office scene.

Themes and the associated code are derived by grounded theory using the software Delve see Figure 10.

From the analysis results, "Questions hard to answer" was the most crucial factor that made the participants feel anxious, which was mentioned in the transcripts of 10 participants. Secondly, three participants mentioned that the job interview was very oppressive and made them anxious. One of the participants said that the feeling of conducting the simulated job interview was like being cross-examined. Three separate participants felt that the actual scene, the formal attire of the virtual interviewer, and being interrupted while answering questions made them anxious. The number of participants who felt that the virtual interviewer's casual outfits and background music helped them avoid anxiety was three. Two separate participants said textured finishes and warm-toned lighting played the same role. Three participants reported that they did not experience anxiety during the simulated interview because they were new to VR.

5 DISCUSSION AND STUDY LIMITATIONS

Based on the theory that anxiety triggers more fluctuations in the galvanic skin response, from the characteristics presented in the physiological data, it is reasonable to assume that the simulated job interview induced anxiety in the participants, causing the galvanic skin response to exhibit significantly different changes than during breathing exercises. From the results obtained by the MASI scale, different virtual reality environments can have participants feel different anxiety levels by adjusting the environmental parameters related to anxiety. In this experiment, the cafe scene deliberately used many environmental parameters with the potential to reduce anxiety levels, and this was verified in the scale results analysis. In

addition, a significant number of participants' responses to open-ended questions suggested that the casual attire of the virtual interviewer in the cafe scene and background music had an effect of avoiding anxiety-provoking, which supported the scale analysis results. Combining the above, we can deduce that the initial hypothesis of the experiment holds. Moreover, we can further answer the research question: In a job interview simulation, individuals' perceived anxiety levels were significantly reduced when introducing environmental parameters with anxiety-reducing effects in a virtual reality environment.

This study was conducted in an artificially controlled and restricted environment. While the investigations were experimentally validated, it is hard to generalize these findings to other conditions. Despite various measures to exclude interference, there is still a lack of conclusive evidence that anxiety is the only factor causing fluctuations in the collected galvanic skin response data. In addition, it may be that many participants wore the E4 bracelet too loosely, resulting in an unstable reading of heart rate data. Therefore we did not get the opportunity to use heart rate data to help demonstrate, which is a pity.

Moreover, using a single open-ended question results in a limited number of excerpts from the raw data when conducting grounded theory research. In addition, this experiment uses the ready-made VR chat environment, which limits the selection of experimental variables to a certain extent so that more potential environmental parameters related to regulating anxiety, such as greeneries and daylighting, cannot be introduced. At last, the sample of participants in this study was insufficient in diversity and number. In order to increase the accuracy of the results, recruiting more people from different backgrounds is required.

6 CONCLUSION

This study was designed to investigate differences in people's experience of anxiety during job interviews in different virtual reality environments. Since anxiety cannot be directly measured, the experiment analyzed participants' physiological data and subjective evaluations of the simulated interview and used a scale to quantify participants' anxiety levels. The findings suggest that a combination of the following environmental parameters, including casual interviewer attire, soothing background music, warm-toned lighting, and textures that add comfort and interest, can effectively reduce individuals' anxiety levels during simulated virtual reality job interviews. This study provides a reference for people conducting VR interviews to reduce the likelihood of triggering anxiety by adjusting environmental parameters. It also helps VR exposure therapy researchers select and design virtual interview scenarios for treatment.

Further research is needed to determine how individual environmental parameters affect job interview anxiety. We expect that more environmental parameters related to anxiety levels will be found and introduced in future research to identify specific parameters with prevalent and significant influences on anxiety levels, which allows precise control over anxiety levels and provides moderate anxiety that can motivate people and promote their performance in the job interview.

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