

Supplementary Materials – Table S1

Study 1 Materials

Informed Consent

A. PURPOSE AND BACKGROUND

The purpose of this research is to explore teamwork, task completion, and time management in virtual reality (VR) meetings. Our goal is to further understand virtual reality as a medium for group work and communication, as well as how design choices and emerging practices shape the experiences of users.

The principal investigators are Dr. Diana R. Sanchez and Dr. Joshua McVeigh-Schultz. Diana R. Sanchez, Ph.D., and Joshua McVeigh-Schultz, Ph.D., are both professors at San Francisco State University. Dr. Sanchez is conducting research for a field experiment in the Department of Psychology. Dr. McVeigh-Schultz is conducting research for a field experiment in the School of Design Department.

You are being asked to participate in this study because you are above the age of 18 and from the U.S.

B. PROCEDURES

If you agree to participate in this research, the following will occur:

On the following screen you will see an electronic audio and screen release form to review and complete.

You will put on the VR gear and will be given instructions on how to operate the VR system.

You will work in a team to complete a series of group tasks in the VR system lasting a total of approximately 30 minutes.

These VR activities will be recorded with audio and screen capturing.

You will be given instructions on what to do for each VR activity.

You may experience movement through the VR environment via a vehicle.

After completing the activity, you will remove the VR gear.

You will complete an online survey and interview over Zoom.

You will be excused from the experiment.

This study will take place online via Zoom or in the researcher's lab, on the fifth floor of the Ethnic Studies and Psychology building (EP507), at a selected date and time that is convenient to you.

Total time commitment will be approximately 60 minutes.

C. RISKS

To our knowledge, involvement in this study should pose no other risk to you beyond the normal risks of daily life. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential risks.

If you are wearing glasses, be aware that the VR headset requires that either contact lenses be worn or that the headset be worn over the glasses. Some individuals have found this uncomfortable due to the pressure that is placed on the glasses from the weight of the headset. Be aware that wearing glasses may cause some discomfort.

You may experience fatigue as a result of sitting at a computer for the duration of the study or from moving around the room during the VR activities. You are welcome to rest, stand, stretch, or to ask to use the restroom between study tasks to alleviate this discomfort.

One of the experiences may include movement along the VR landscape via a large vehicle, known as "the barge." There is a small risk of discomfort or motion sickness due to the nature of this activity; however, participants can stop participation in the research at any time. If you believe this experience (i.e., movement along the VR landscape) will be distressing or disturbing for you, please let the research assistant (RA) know now that you would like to discontinue the study.

We will be taking audio and screen recordings of the VR activity. However, these recordings will never be associated with your name and will take place in a closed room out of sight from others. A risk may include potential loss of privacy by recording the VR experience. The risk will be minimized by conducting the experience in a closed room out of sight from others, and by de-identifying (i.e., using an anonymous Participant ID number and nickname) all recordings and storing the recordings on a password protected computer. An Audio and Screen Release Form is also provided during the consent process.

D. CONFIDENTIALITY

This study is anonymous with all information being de-identified; your name and other identifiable information will not be stored. Your email is only being recorded for communication purposes and will never be connected to your research data.

Recordings will be taken during the VR activity and interview portion of the experiment. Both audio and screen recordings will be taken, which will include your movements and voice reactions during the VR activities. These recordings will only be used for research and publication purposes, and will be stored using your anonymous participant ID# assigned at the beginning of the study. These recordings will never be connected with your name or other identifying information. Once coded and all publications / presentations for this project are complete, all recordings will be deleted according to SFSU policy.

All research data will be stored in a password protected PC, SFSU Box, and Qualtrics. Data will be stored in these secure locations for a minimum of three years and may be kept indefinitely. Only the researcher and designated research assistants will have access to the data. All stored data may be used in the future but will be only used for research purposes consistent with the original purpose of the research stated in this consent.

Because you will be using a computer that is connected to the Internet, please only do actions as instructed by the research assistant and never type in or verbally state any information that could be used to identify you at a later date.

E. DIRECT BENEFITS

There are no direct benefits to you from participating in this study, although we hope you will find the study enjoyable and interesting.

F. COSTS

There will be no cost to you for participating in this research.

G. COMPENSATION

Participants will be compensated a \$5 Amazon gift-card for completing the study.

H. ALTERNATIVES

Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participating at any time without penalty. The alternative is not to participate in the research.

I. QUESTIONS

You have spoken with a research assistant about this study and have had your questions answered. If you have any further questions about the study, you may contact the researchers by emailing Dr. Diana R. Sanchez and/or Dr. Joshua McVeigh-Schultz, at SanchezDianaR@sfsu.edu and/or Jmcvs@sfsu.edu. Questions about your rights as a study participant, or comments or complaints about the study, may also be addressed to the Human and Animal Protections at 415: 338-1093 or protocol@sfsu.edu.

J. CONSENT

You may request a copy of this consent form to keep.

PARTICIPATION IN THIS RESEARCH IS VOLUNTARY. You are free to decline to participate in this research, or to withdraw your participation at any point, without penalty. Your decision whether or not to participate in this research will have no influence on your present or future status at San Francisco State University.

Survey Questions

What is your current age in years (e.g., 28)? ____

How do you identify? (select one)

- Female
- Male
- Transgender Female
- Transgender Male
- Genderqueer/Non-binary
- Intersex
- Non-disclosed
- Other (please explain)

Which best describes your ethnic or racial identity? (select one)

- White or Caucasian/European Origin
- Black, African American, or Other African Origin
- Latina/o/x or Hispanic
- Asian American or East Asian Origin
- Native American or Alaska Native
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- Middle Eastern or North African Origin
- South Asian Origin
- Two or more / Mixed Race
- Non-disclosed
- Other (please explain)

Select the industry in which you plan to work (select one)

- Accommodations and Food Services
- Administrative and Support Services
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- Arts, Entertainment, and Recreation
- Construction
- Educational Services
- Finance and Insurance
- Government
- Health Care and Social Assistance
- Information Technology
- Management of Companies and Enterprises
- Manufacturing
- Mining, Quarrying, and Oil and Gas Extraction
- Other Services (Except Public Administration)
- Professional, Scientific, and Technical Services
- Real Estate and Rental and Leasing
- Retail Trade
- Transportation and Warehousing
- Utilities
- Wholesale Trade

Access to VR

Which of the following VR headsets do you have access to for participating in a remote VR meeting session?

- Oculus
- HTC Vive
- Index
- Playstation VR
- Other (not listed here)
- I do not have access to a VR headset

The remaining questions were all scored on a 5-point scale from 1 = Strongly Disagree to 5 = Strongly Agree.

VR Pursuit (Sanchez & Langer, 2019)***Intentional VR Use***

- I spend many hours each week using VR.
- I have searched for information (e.g., magazines or websites) to improve my VR skills.
- I plan to continue improving my VR skills.
- I am proactive in seeking ways to improve my VR skills.
- I deliberately seek out VR experiences.
- I would call myself a "serious" VR user.

Self-Efficacy with VR

- I am good at using VR, compared to others.
- I am confident at using VR.
- I have good VR skills.
- I have a lot of experience with using VR.
- Based on my knowledge of previous VR usage, I can easily manage VR controls.
- I can keep up with a VR experience that moves quickly.

Enjoyment of VR

- I enjoy VR.
- VR is fun.
- I like using VR.
- I think VR is entertaining.

Prone to VR Immersion

- I lose track of time when I use VR.
- When I use VR, I lose track of my senses (e.g., can't tell if I am getting hungry or tired).
- I am fully immersed when I use VR.

Intimidation with VR (Sanchez & Langer, 2020)

- VR is intimidating to me.
- I would need help to figure out the controls of a VR experience.
- Learning how to use VR is confusing.
- I find VR confusing.
- It takes me a long time to understand the controls of a VR device.
- I find it difficult to understand VR.

Supplementary Materials – Table S2

Study 2 Materials

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A. PURPOSE AND BACKGROUND

The purpose of this research is to explore teamwork, task completion, and time management in virtual reality (VR) meetings. Our goal is to further understand virtual reality as a medium for group work and communication, as well as how design choices and emerging practices shape the experiences of users.

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Audio & Screen Recording Release

As part of this project, we will be making audio and screen recordings of you during your participation in the research. Please indicate what uses of these video recordings you are willing to permit, by clicking next to the uses you agree to, and then clicking "I Agree" at the end of the form.

This choice is completely up to you. We will only use the recordings in ways that you agree to. In any use of the recordings, you will not be identified by name.

Agreement to both of the uses listed below is required to continue participation in this study.

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I have read the descriptions and I give my consent for the use of the recordings as indicated by my selections.

- The recordings can be studied by the research team for use in the research project.
- The recordings can be used for scientific publications.
- I understand that although my voice and screen recordings may be shared, my name will not be used in public facing / publications / presentations.

Pre-Survey Questions

What is your current age in years (e.g., 28)? _____

How do you identify? (select one)

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- Government
- Health Care and Social Assistance
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Prior Knowledge

- How much exposure / familiarity do you have with aviation or the airline industry?

Time Monitoring (Claessens, 2004)

In general, while executing my tasks, I regularly check whether...

- I will attain my goals.
- My work is on schedule.
- I am making the best use of my time.
- I have performed what I intended to do.
- I can use my time in a better way.
- There is progress.

VR Pursuit (Sanchez & Langer, 2019)

Intentional VR Play

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- I am fully immersed when I use VR.

Post-Survey Questions

All responses were collected on a scale of 1 = Strongly Disagree, 5 = Strong Agree.

Presence (Makransky et al., 2017)

- The virtual environment seemed real to me.
- I had a sense of acting in the virtual environment, rather than operating something from outside.
- My experience in the virtual environment seemed consistent with my experiences in the real world.
- While I was in the virtual environment, I had a sense of "being there."
- I was completely captivated by the virtual world.

Embodiment (Makransky et al., 2017)

- I felt like my virtual body was an extension of my real body within the virtual environment.
- When something happened to my virtual body, it felt like it was happening to my real body.
- I felt like my real arm was projected into the virtual environment through my virtual body.
- I felt like my real hand was inside of the virtual environment.
- During the simulation, I felt like my virtual body and my real body became one and the same.

Task Motivation (Markland & Kardy, 1997; McAuley et al., 1991)**Interest-Enjoyment**

- I enjoyed participating in this VR Activity very much.
- This VR Activity was fun to do.
- I think this VR Activity was boring. (R)
- This VR Activity did not hold my attention at all. (R)
- I would describe this VR Activity as very interesting.
- I think this VR Activity was quite enjoyable.
- While participating in this VR Activity, I thought about how much I enjoyed VR.

Perceived Competence

- I think I did pretty good during the VR Activity.
- I think I did pretty well in this VR Activity, compared to other participants.
- I was pretty skilled at the level of tasks presented in this VR Activity.

Effort-Importance

- I put a lot of effort into this VR Activity.
- I didn't try very hard to do well in this VR Activity. (R)
- I tried very hard in this VR Activity.
- I didn't put much energy into this VR Activity.

Pressure-Tension

- I did not feel nervous at all while participating in the VR Activity.
- I felt very tense while participating in this VR Activity. (R)
- I was very relaxed in doing the tasks presented in this VR Activity.
- I felt pressured while participating in this VR Activity. (R)

Perceived Effectiveness (Ohland et al., 2012)

Read the following statements and select the answers that best describe your team experience.

- The members of my team communicated effectively.
- The members of my team facilitated effective communication in the team.
- The members of my team exchanged information among teammates in a timely manner.
- The members of my team provided encouragement to other team members.

- The members of my team expressed enthusiasm about working as a team.
- The members of my team heard what teammates had to say about issues that affected the team.
- The members of my team got team input on important matters before going ahead.
- The members of my team accepted feedback about strengths and weaknesses from other teammates.
- The members of my team used teammates' feedback to improve performance.
- The members of my team let other team members help when it was necessary.

Knowledge Sharing (Bart Van Hoof & Huysman, 2007)

- I liked to be kept fully informed of what my teammates knew.
- When I needed certain knowledge, I asked my teammates about it.
- I regularly informed my teammates of what I was working on.
- When I learned something new, I made sure my teammates learned about it too.
- I shared information that I acquired with my teammates.
- I asked my teammates about their skills when I wanted to learn particular skills.
- I considered it important that my teammates were aware of what I was working on.
- When a teammate was good at something, I asked him/her to teach me.

Discomfort with VR (Grigorovici & Constrantin, 2004)

Please indicate how true each of the following statements were for your experience in the VR Activity.

- I felt disoriented.
- I felt tired.
- I felt dizzy.
- I got eye strain.
- I felt nauseated.
- I got a headache.

(R) Reverse coded questions.