

Tele-virtual reality: A study on a virtual, socially distanced TV experience

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Figure 1. BigScreen Beta, an existing virtual reality technology for socially distanced gatherings.

Abstract

As virtual reality (VR) technology increases in popularity, more ways to leverage its usage in our relationships are emerging. In particular, long-distance couples may benefit from using VR to satisfy their emotional needs while learning to navigate geographic separation, time differences, the absence of physical contact, and the increasing craving for togetherness [7, 14]. An activity that is common for long-distance couples is watching television while video or voice chatting. While this experience is fairly novel in VR, it could prove fairly advantageous to long-distance relationships because of the increase in immersion. Our aim was to find the preferred experience for this socially distanced, virtual TV experience. We conducted twenty individual interviews and two focus groups. Questions focused on customization, preferred setting, avatar representation, as well as overall

impressions. Participants overwhelmingly favored realistic features over gamified adaptations. Nonetheless, some were apprehensive about using virtual reality for this purpose.

CCS Concepts: • Human-centered computing → Virtual reality.

Keywords: virtual reality, long-distance relationships, social VR

ACM Reference Format:

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1 Introduction

Technology is constantly shifting and growing in the realm of computer-mediated communication. As a result, our lifestyles must adapt to accept these changes. The Covid-19 pandemic brought the world to a grinding halt, thus increasing the prevalence of remote communication on a wide scale [6]. The effects of this are still felt today and the number of long-distance relationships continues to grow [5]. Technological advancements must follow suit to meet this demand and turn remote interactions into a seamless experience.

A common issue with long-distance relations is the struggle to keep the relationship alive as time passes. Video calls,

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constant messaging, and sending pictures is not enough to replicate the closeness felt in a physical relationship. Long-distance couples or friends and family who are separated geographically may benefit from the immersion offered by virtual reality (VR). Couples in long-distance relationships (LDRs) highly praise social VR chat rooms, rating their experiences with them as positive, beneficial, and emotionally satisfying for making them feel that they are “together” in an LDR [14].

A typical activity in an LDR is watching shows or movies together through a shared streaming service or screen-sharing while video chatting. We believe adapting this method for VR could increase interaction within an LDR, thus improving relationship satisfaction and communication. Realistically seeing the partner (fully, as opposed to just on a screen), hearing them without having to pause the movie (perhaps with 3D surround sound), and customizing the watching environment are just some examples of how this activity can be transformed. The implementation of these factors, among others, is still left to be explored as this is a novel experience in the sphere of VR. Additionally, there is the question of whether people are open to adapting to this technology relative to factors like cost and usability.

2 Research Question

In an effort to better understand computer-mediated communication in relation to LDRs within virtual worlds, we propose the following research question:

RQ: *What is the preferred experience for watching TV socially using VR?*

This research focuses on the quality of the experience and defining which criteria could make this journey more desirable. In some studies, LDRs are defined by a certain mile-cut off. For our study, we left it up to the participants to define their relationship as an LDR instead of following an operational definition to help avoid incorrectly categorizing couples [12]. We also consider familial relationships and friendships in the context of LDRs.

3 Related Work

First, we looked at what current applications exist in VR and validated the promised features of each technology.

3.1 Single User Applications

With the increasing popularity of VR headsets, streaming services such as Netflix and Prime Video translated their product into the virtual world with the Oculus Quest 2 [4]. Currently, their applications are limited to basic functionalities with single-user modes that only support the stationary sitting position. User reviews show that most people are not



Figure 2. Avatar representation in BigScreen Beta.

satisfied with just these basic features [1]. Common complaints include the lack of customization of the interior room and the inability to change the screen size. However, users who were new to VR enjoyed the experience of detaching themselves from their real environment into a simple, cozy, dimmed room [2]. Other companies have adapted this VR setup to their streaming service, including Pluto TV, YouTube, and Meta Quest.

3.2 Multi-User Applications

Another application that is popular among Oculus Quest 2 users is BigScreen Beta. It offers public and private multi-user shared streaming experiences (Figure 1). Strangers from around the world can meet up and interact in virtual cinema rooms. Users can also create private sessions that are only accessible to their targeted friends and family. Moreover, it also allows co-workers to gather privately in virtual office spaces for work-related purposes [2]. BigScreen Beta is consistently updated with new features, unlike the basic, single-user applications mentioned earlier. It also offers 3D watching experiences and virtual snacks to interact with. From the user interface (UI) perspective, users are visualized with avatars that resemble humans but do not have limbs due to limitations in animating figures in VR (Figure 2). However, these avatars are customizable and users can accessorize their characters [2].

According to reviews, users are generally impressed with the features offered by BigScreen Beta. However, many also have difficulty immersing themselves in this virtual world. [2]. A criticism of the application is the personal space violations that occur in public environments and errors with movie purchases. However, these two concerns are unrelated to the scope of this research, since our focus is on finding the preferred experience for watching movies and shows. Unfortunately, the reviews do not specifically disclose these preferences relative to LDRs. So then, the question arises of how acceptable it is to limit the representation of the users to this cartoon-like, avatar form. Additionally, what does this

version of the shared TV experience lack, which takes away from the immersion and interaction needed for an LDR?

4 Study Design

A caveat of our study is understanding people's opinions of an application that does not yet exist. As we want to do a deep dive into the user's needs, concerns, and ideas, we chose (1) focus groups, and (2) interviews for the evaluation of distanced TV. Our aim is to further our understanding of the necessity of such an invention and the possible methods of its application. Additionally, it is critical to consider the beliefs and attitudes surrounding this novel technology as well as how it may alter long-distance relationships.

To reduce biases in our data, our aim was to have a balanced set of participants in age, gender, and varying nationalities. It was important that we considered individuals who are currently in an LDR or have been before. Additionally, we wanted them to be familiar with VR. Following the standard of data saturation with purposive sampling, it was critical to interview at least twelve subjects [8]. The number of interviews increased as we tried to diversify our pool of participants. In total, twenty interviews and three focus groups were conducted.

4.1 Creative Brainstorming Pilot Study

During the early stages of the study, we ran a creative brainstorming session to gather innovative ideas. Participants struggled to visualize the concept. We concluded that a visual aid was necessary to guide the participants.

Although it was possible to re-try the creative brainstorming method, we decided against it. Given the novelty of the study's central premise, it would be necessary to show the participants a clip of existing technology (BigScreen Beta). Unfortunately, this would in turn influence the participant's ideas during the brainstorming session and ruin its purpose.

In our case, letting people's imaginations run wild in a creative brainstorming session would not be beneficial, as they are not experienced enough with VR to overcome the boundary of visualizing the experience.

4.2 Focus Group

Due to the unconstrained nature of our research (since the technology has yet to be implemented), we believed the focus group would be the best way to better understand the beliefs and pain points of possible future users. It was our goal to capitalize on the rich discussions provided by focus group sessions to explore the multiple perspectives that even just one session offers. Participants exchanged ideas, past experiences, and opinions on the topic, which positively altered the course of our research.

4.2.1 Participants Face-to-face convenience sampling was used to gather individuals for our focus group. The goal was to find the most willing participants. This method was ideal

for collecting as many ideas and impressions as possible. Recruiting people from varying backgrounds and nationalities from our international master's program was a trivial task. All participants had a background in informatics. Even if they had not used VR before, they understood the technology enough to comment on it - thus, we did not consider VR experience to be a must when selecting participants. Also, since we were only interviewing international students, we could conclude that they understood the nature of long-distance relationships.

4.2.2 Procedure Within each focus group, one researcher was assigned the role of the moderator, effectively communicating the goal of the study and asking questions. The second researcher monitored the sessions, ensuring they ran smoothly while helping to guide the discussions. The third researcher was responsible for writing notes down to better understand the participant's response and consider fitting follow-up questions.

In order to ensure confidentiality and protect anonymity, participants were asked to sign a consent form regarding ethical considerations at the start. Discussions were transcribed anonymously for later analysis. During the sessions, researchers tried to create a comfortable and neutral setting for the participants. The size of the group was selected small, around 4 to 6 people, to allow for more in-depth discussion and to make it easier for the researchers to manage the group. In the beginning, the research objectives were clearly defined. Questions were asked in a variety of formats: open-ended, close-ended, and probe questions to encourage discussion. It was critical to use different types of questions in order to elicit various responses and to avoid leading the participants. Each person was given enough time to discuss their thoughts and opinions. The most silent participants were encouraged to speak up to ensure that all ranges of inputs are heard. In the end, the participants were thanked for their contributions and given the opportunity to add any additional thoughts or feedback.

The approach above was based on best practices in order to hold the most constructive focus group session [11].

4.3 Interviews

Conducting interviews is an excellent way to gather detailed information, as it allows us to explore the subject more in-depth. The participants can elaborate on their thoughts and introduce topics that might not be covered in a focus group, where other people are present and their time to talk is limited. Our goal in using this method is to gather a deeper understanding of participants' thoughts, without any outside influence but also to identify the costs and benefits of the existing technology for socially distanced TV.

4.3.1 Participants To recruit participants for the interviews, we used face-to-face purposive sampling, targeting individuals in a variety of long-distance relationships (family,

Number of Focus groups	3
Total number of participants	12
Total number of Female participants	7
Total number of Male participants	5
Total number of participants with any type of LDR	10
Total number of participants who used VR before	8

Figure 3. Focus Group Participants

friends, romantic partners). We wanted to focus on people who understand the feeling of truly missing someone for extended periods of time.

For this method, the experience of participants was not important for the same reasons as for the focus group. We targeted people from our master's program that are expatriates. Before asking them to participate in our study, we kindly asked them if they are currently in any form of a long-distance relationship. We also asked which of the three types (family, friends, romantic) their relationship falls into. It was critical to study a variety of relationships to avoid results biased towards romantic partners. The technology we are studying, after all, can be used by family members and friends as well.

We wanted to interview people from a variety of age ranges, including older generations. Thus, we were not strict in choosing individuals who had experience with watching socially distanced TV. This is a compromise we were willing to make for the purpose of sampling people of a variety of ages. It was also critical to see whether people who have not had experience with traditional methods of distanced TV-watching would be open to this idea, but adapted to VR.

4.3.2 Procedure The interview began by establishing a relaxed and non-intimidating atmosphere for the interviewee. To prevent any sense of being outnumbered, some of the interviews were done individually by one of the three researchers involved in the study. The researchers conducted a total of 20 interviews. Two of them conducted 7 interviews each, and the other researcher conducted 6 interviews. Some of the interviews were also held as one person conducted the interview while the other transcribed the replies. The

researcher ensured that during the session their full attention is on the participant while they are transcribing and taking notes for later analysis. The researcher obtained verbal consent from the participants at the start of the session to record the process to be used as anonymized data in the study. The interviews followed a semi-structured approach and took approximately 10 to 15 minutes. All questions were open-ended and follow-up questions were asked if necessary. It was most important not to add leading questions and to avoid pressuring the interviewee.

In the end, participants were thanked for their time and given the chance to ask any questions.

	Gender	Age	Background	Nationality	Type of LDR (Family & Friends)	In romantic LDR	Experience with VR
Participant 1	Female	25	IT	Italian	✓		✓
Participant 2	Male	26	IT	Danish	✓		✓
Participant 3	Female	24	IT	Greek	✓		
Participant 4	Male	31	IT	American	✓		✓
Participant 5	Female	23	IT	Cypriot	✓	✓	✓
Participant 6	Male	33	Sport Science	Iranian	✓		✓
Participant 7	Female	24	IT	Greek	✓	✓	✓
Participant 8	Male	22	Medical	Greek	✓	✓	✓
Participant 9	Female	25	Product design	Greek	✓	✓	✓
Participant 10	Male	27	Agricultural	Greek	✓	✓	✓
Participant 11	Male	22	IT	American	✓	✓	✓
Participant 12	Female	22	IT	Dutch	✓	✓	✓
Participant 13	Male	25	National Science / Physics	Israel	✓		
Participant 14	Female	33	Business IT	Mexican	✓	✓	✓
Participant 15	Female	53	Journalist	Iranian	✓		
Participant 16	Female	60	Editor	Iranian	✓		✓
Participant 17	Male	70	Businessman	Iranian	✓		✓
Participant 18	Female	80	HouseWife	Iranian	✓		
Participant 19	Female	93	Charity Manager	Iranian	✓		
Participant 20	Female	45	Movie stage designer	Iranian	✓		miro

Figure 4. Interview Participants

4.4 Analysis

We transcribed our data using the Nvivo software [3]. The Straussian Grounded Theory [13] approach was selected and we proceeded with open coding, axial coding, and selective coding, consecutively. This approach was ideal since it allowed for the synthesis of novel theories as they emerged from the data.

We began with open coding, first reviewing the transcripts to derive new theories and concepts. We broke up the transcripts into distinct parts and created relevant codes. Afterward, we proceeded with axial coding, by observing these codes to find connections between them and group them into categories. Finally, we practiced selective coding by connecting all the created categories from axial coding to one core category: the preferred experience for watching TV socially using VR.

We have visualized the gathered data using multiple approaches to gain the best insight. One of the approaches was a mind map (Figure 5). We have chosen this method because it organizes and structures information in a way that is easy to understand and remember. Furthermore, it allows for the creation of non-linear connections between ideas and concepts, making it easier to brainstorm and come up with new ideas.

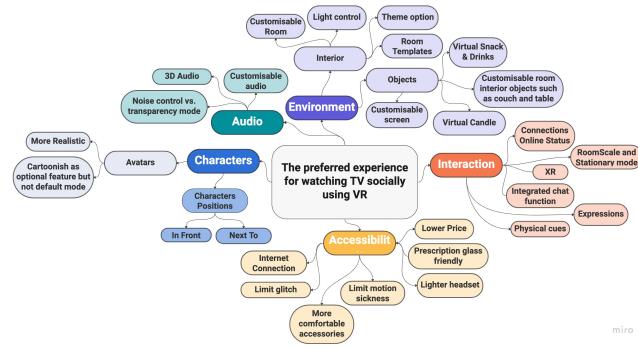


Figure 5. A Mind Map diagram organizing and structuring the generated ideas surrounding the preferred experience of watching TV socially within VR.

5 Study Results

Using the core categories which emerged from our axial coding stage, we split our results into several themes concerning accessibility, interaction, the environment, characters, audio, novelty, and demographics. A representation of realistic versus gamified elements that could be featured in this VR experience is shown on a spectrum in Figure 6. Generally, people preferred realism, but overall liked the idea of customization that a game-like experience could provide.

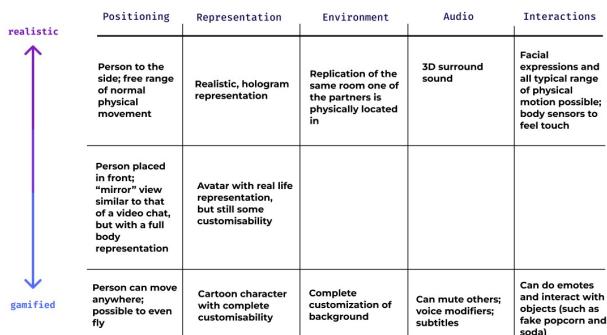


Figure 6. A visualization depicting the spectrum between realistic and gamified features which can be implemented in the virtual, socially distanced TV experience. Gamification in this context relates to applying game-like elements to an application with the aim of enhancing social interactions and increasing user activity [9].

5.1 Accessibility

The most prominent issue discussed was accessibility. There were some main issues that were noticed by participants who have tried VR before. These concerns were related to physical, visual, auditory, and cognitive accessibility.

Headsets were consistently reviewed as a hindrance to the VR experience. They are expensive and difficult to wear for extended periods of time due to their weight and bulky design. Additionally, participants with faulty vision felt the standard headset design did not take into account those who wear glasses. Many participants believed that the hassle of setting up and putting on the headset would take away from the enjoyment of watching a show. Furthermore, VR can be difficult for people with hearing impairments to use, as the audio is not designed to be easily heard by people with hearing loss. Currently, there are some accessories to create a better audio experience but is not yet known if that is enough.

Moreover, motion sickness was a significant factor to consider as well. Participants who experienced nausea previously were not accepting of watching TV socially using VR.

An alternative that may solve some of these accessibility issues is the use of lightweight AR glasses instead of the traditional VR headset. An overwhelming majority of participants agreed that this would convince them to use the proposed technology.

5.2 Interaction

Interaction within VR is often targeted to create an immersive experience between the user and the virtual environment. Most of the participants expect more from these interactions, especially better physical ties. For example, they want to see the expressions that their watching partner was making to be more realistic. Furthermore, for increased comfort, some preferred extended reality (XR) to have a balance between reality and the virtual world. Few of the participants also prefer to have an overview of the online contacts and available integrated chat functions. The use of haptic gloves to feel touch was also discussed, but overall had negative feedback.

5.3 Environment

All participants showed their interest in the ability to customize their virtual environments in VR. This can include things like changing the landscape, mimicking your own room interior, and other elements that can be adjusted to personalize the experience. Customization options can add to the immersion and enjoyment of using VR, as users can tailor the virtual world to the preferences that they are most comfortable in. For making the experience more interactive and fun, they also showed interest in elements such as virtual snacks and virtual candles to create a romantic atmosphere.

5.4 Characters

Participants also showed their preference leaning towards more realistic characters in VR, as they can add to the sense of immersion and make the virtual experience feel more lifelike. However, it's also worth noting that some participants were also open to cartoonish avatars as they are more fun and less intimidating. Ultimately, it can depend on the type of long-distance relationship. For romantic relations, participants did prefer the most realistic version. Realistic characters help them feel more connected to the virtual world and can make interactions with other users more engaging. On the other hand, some participants found realistic avatars in VR uncanny, as they can look almost human-like but still not quite right, which can be unsettling. However, quality is a huge factor in this. A hologram or digital representation of the partner in the experience seems to be more popular among the participants. The hologram avatars promised an expressive and dynamic experience, allowing for more natural interactions with other users in the virtual world. Currently, the use of holograms has some limitations in terms of technology and availability and is more feasible in the AR concept.

5.5 Audio

Participants who have used video-chatting and screen-sharing methods to watch movies in an LDR disliked the overlap between the sound of their watching partner talking and the sound of the movie. Three-dimensional, spatial surround sound was considered to be a solution for this. Some participants also enjoyed the possibility of muting the other person. Others also favored translucent audio - if the person were speaking, then the movie or show's volume would lower to reduce the issue of sound overlap.

5.6 Novelty

The starting design of headsets and subpar graphics are a testament to the fact that VR has a long way to go before people generously adopt it into their daily lives. Participants generally believed that voice-chatting and video-chatting are preferred to using VR for watching TV with their friends, family, and loved ones who are abroad. The increase in immersion is not convincing enough for these individuals to consider using VR for this purpose.

5.7 Demographics

We found that age, background, or familiarity with VR did not affect how accepting participants were of the technology. How tech-savvy the individual is played the most important role. Those who are more interested in technological advancements were more likely to be open to the idea and see how the experience will feel. However, to consider VR for daily use in the shared virtual TV experience, even the tech-savvy participants felt that many of the observed technical challenges must be resolved.

6 Conclusions

Overall, the preferred socially distanced TV-watching experience seems to vary from person to person. Nonetheless, some trends were observable in the data we collected (Figure 7).

Number	Theory
1	Not enough people are aware of the latest capabilities of VR
2	People expect the most realistic experience when it comes to VR
3	Cartoonish visualizations are more acceptable in basic game interactions. It has a more negative effect on social interactions such as watching TV in VR shared experience
4	People prefer to have more immersive physical cues and more realistic facial experience
5	In order for the VR shared TV experience to be a convincing investment for people, the most realistic key features should already be included
6	A glitch and poor quality in the shared VR experience are considered more negative than the traditional approach to watching TV via video calls
7	People with tech-savvy personalities leaning more toward this type of setup and are more positive regarding using VR on their daily LDR virtual shared TV experience

Figure 7. Theories formulated from interview results.

It is evident that while people are interested in the premise behind VR, it will take some time for it to pick up steam. A similar trend was observed with smartphones, as it took several years for them to gain widespread acceptance. Nonetheless, today the number of devices is more than the number of existing households [10]. Individuals are hesitant to adopt new technologies that they are unfamiliar with.

At the same time, it is difficult to say whether the benefits of VR currently outweigh the disadvantages when reviewing the cost, accessibility issues, and subpar aesthetics which plague the technology. The fishbone diagram in Figure 8 further outlines the key issues and their causes surrounding the distanced TV experience. This, as well as bulky equipment and cost, are pain points that act as deal breakers for many individuals despite the promise of increased immersion.

7 Discussion

This section outlines the limitations encountered in our study, as well as our proposed future directions for improving its outcomes. Given the nature and duration of the study, these limitations are discussed in order to present a clear understanding of what can be done differently in future studies.

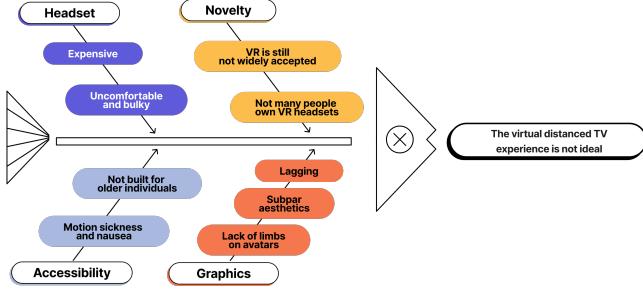


Figure 8. A fishbone diagram showing the key issues present with the existing virtual, socially distanced TV experience. Key themes include accessibility, headset complications, novelty, and subpar graphics.

7.1 Limitations

Despite our best efforts, limitations were inevitably encountered within our study. Convenience sampling was used in order to acquire the most participants within the limited time we had to complete the research. Evidently, we recruited many people from our study program. This may have biased the results, as our program is strongly IT-related. As a result, the sample may not be representative of the real-world population.

Another limitation relates to the current capabilities of virtual reality software. Participants were generally unimpressed with the state of VR today, which in turn led to skepticism regarding how desirable the socially distanced TV-watching experience would be. Additionally, although a considerable part of the sample had tried using VR once or twice, these few occurrences have shaped their view of the technology. The experiences were typically described as short in duration, meaning they were not able to get the full picture. As a result, participants were more than likely negatively biased about VR from the beginning if they endured motion sickness or software glitches. The lack of advancements in the software paired with the biased experiences our participants had with VR, makes it difficult for them to fully envision our research question and provide insightful opinions for our study.

In an ideal scenario, we would have provided the participants with a similar virtual experience through an application, but conducting such a study raises ethical concerns that we wanted to avoid. VR technology can simulate experiences that may cause motion sickness or even expose participants to traumatic scenarios.

7.2 Future Work

We believe that future studies should use a larger sample of participants, primarily those with non-IT-related backgrounds. Staying on the same subject of sampling and recruitment, more experts in VR technology must be recruited. Their experience could bring about novel ideas and insights

that are preferred to that of non-experts. They have specialized knowledge and understanding of VR technology and its use in various fields, such as gaming, education, and healthcare. They can provide valuable insights into the design and implementation of the study, as well as help identify potential issues or limitations. For example, the most experienced users may have established knowledge of how physical accessories should be modified to increase comfort.

Additionally, consulting with experts can help to ensure that the study is conducted in a scientifically rigorous manner. Without their input, the study may be less effective and potentially yield inaccurate or misleading results. The pilot study's creative brainstorming sessions, for example, would have proved far more helpful with the input of participants who could more easily envision the socially distanced TV experience in VR.

7.3 Implications

A significant implication of our study is a deeper understanding of user preferences for engaging in VR environments focused on interactions and activities between users. Additionally, our study identified areas of VR technology that require improvement before people feel they can accept it into their arsenal of daily used devices. The results of this study may guide the development of VR applications. It is critical to eliminate the limitations of the current technology and bring couples, families, and friends that live far apart closer together. Such applications would promote social interactions and reduce feelings of loneliness, isolation, and possibly depression.

This technology may also impact the television industry. An example of this is creating movies and shows with an interactive element that allows VR users to watch from a first-person perspective.

It is also important to consider privacy issues that may arise, such as private-room hacking and data misuse. Additionally, an increase in VR interactions may also lead to an unfortunate increase in virtual sexual harassment.

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8 Appendices

A Figures

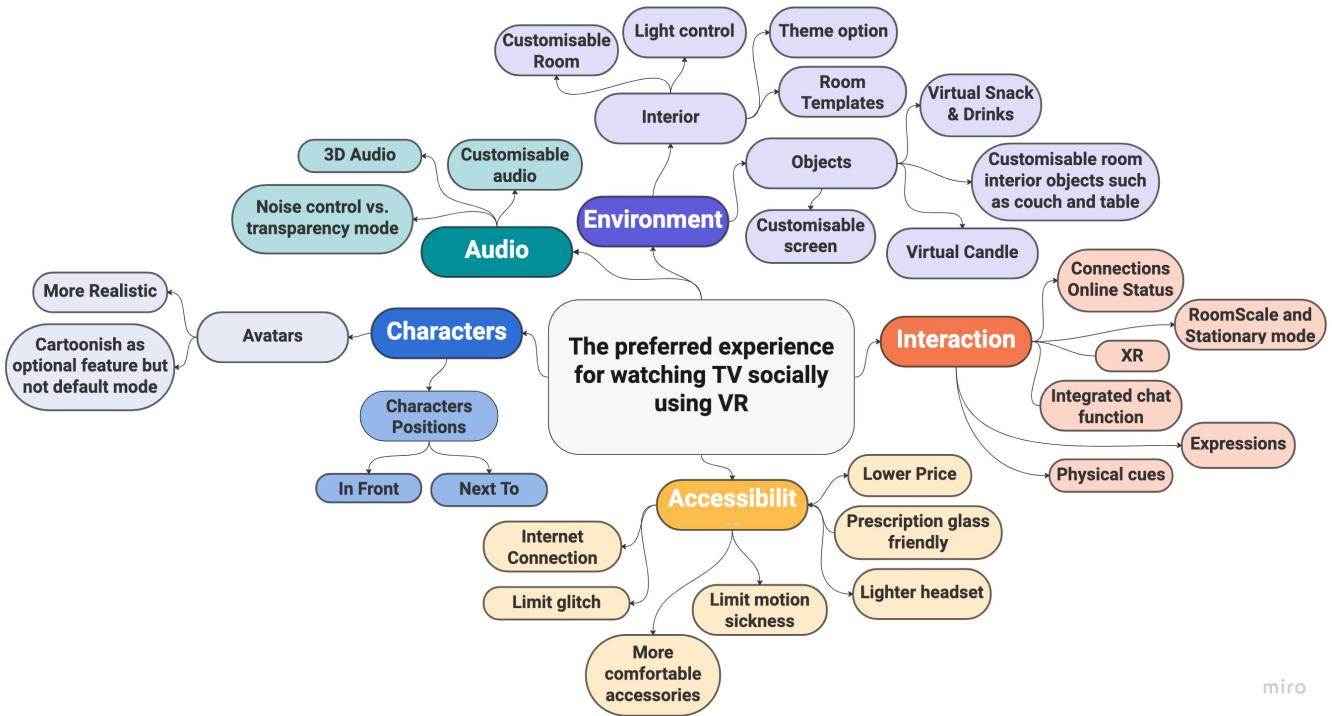
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Focus group Participants

	Gender	Age	Background	Nationality	Type of LDR (Family & Friends)	In romantic LDR	Experience with VR
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Participant 2	Male	26	IT	Danish	✓		✓
Participant 3	Female	24	IT	Greek	✓		
Participant 4	Male	31	IT	American	✓		✓
Participant 5	Female	23	IT	Cypriot	✓	✓	✓
Participant 6	Male	33	Sport Science	Iranian	✓		✓
Participant 7	Female	24	IT	Greek	✓	✓	✓
Participant 8	Male	22	Medical	Greek	✓	✓	
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Participant 19	Female	93	Charity Manager	Iranian	✓		
Participant 20	Female	45	Movie stage designer	Iranian	✓		miro

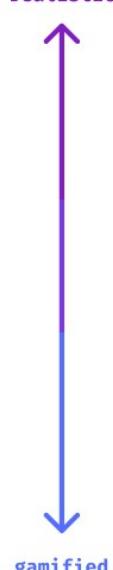
Interview Participants



miro

A Mind Map diagram organizing and structuring the generated ideas surrounding the preferred experience of watching TV socially within VR.

Positioning	Representation	Environment	Audio	Interactions
Person to the side; free range of normal physical movement	Realistic, hologram representation	Replication of the same room one of the partners is physically located in	3D surround sound	Facial expressions and all typical range of physical motion possible; body sensors to feel touch
Person placed in front; "mirror" view similar to that of a video chat, but with a full body representation	Avatar with real life representation, but still some customisability			
Person can move anywhere; possible to even fly	Cartoon character with complete customisability	Complete customization of background	Can mute others; voice modifiers; subtitles	Can do emotes and interact with objects (such as fake popcorn and soda)

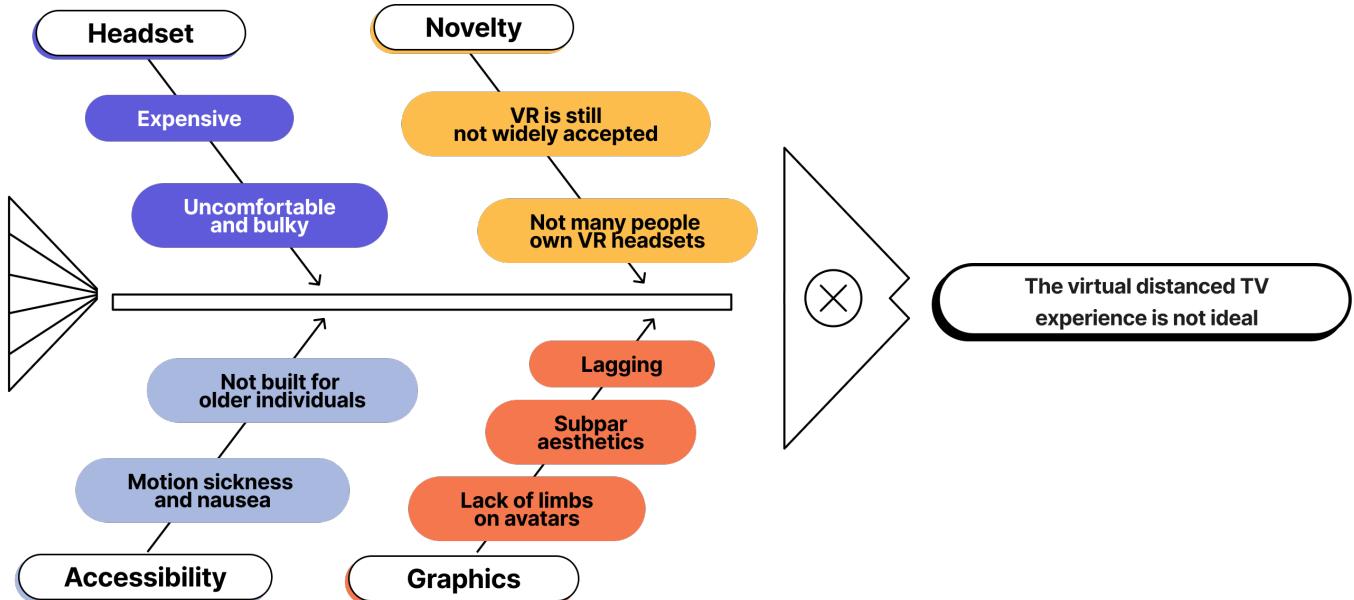


A visualization depicting the spectrum between realistic and gamified features which can be implemented in the virtual, socially distanced TV experience. Gamification in this context relates to applying game-like elements to an application with the aim of enhancing social interactions and increasing user activity (Hamari, 2013).

Number	Theory
1	Not enough people are aware of the latest capabilities of VR
2	People expect the most realistic experience when it comes to VR
3	Cartoonish visualizations are more acceptable in basic game interactions. It has a more negative effect on social interactions such as watching TV in VR shared experience
4	People prefer to have more immersive physical cues and more realistic facial experience
5	In order for the VR shared TV experience to be a convincing investment for people, the most realistic key features should already be included
6	A glitch and poor quality in the shared VR experience are considered more negative than the traditional approach to watching TV via video calls
7	People with tech-savvy personalities leaning more toward this type of setup and are more positive regarding using VR on their daily LDR virtual shared TV experience

miro

Theories formulated from interview results.



A fishbone diagram showing the key issues present with the existing virtual, socially distanced TV experience. Key themes include accessibility, headset complications, novelty, and subpar graphics.

B Informed Consent Form

Tele-virtual reality: A study on a virtual socially distanced TV experience *Consent Form*

Purpose

The purpose of this study is to explore what the preferred experience is for watching television using VR technology with a long-distance watching partner.

Benefit

The benefit of this study will be a better understanding of people's beliefs and attitudes about the viability of using virtual reality for increasing interaction in long-distance relationships. It will also be clearer what features and setup is preferred for this kind of experience, as well as what issues or problems may need to be considered.

Methods

- Focus Group
- Interview

Confidentiality

Your name and data will be anonymized and kept confidential.

I confirm that this study has been explained to me and I've had the opportunity to ask questions for further clarification.

I am aware that my responses will be recorded.

I consent to my anonymized data being used for this study.

I understand that participation in this study is voluntary and I may withdraw at any point in time.

I understand that upon my request, the data I provide in this study can be deleted.

I understand that my data will be securely stored by researchers, but also that my anonymized data may be used for future related research purposes.

I am 18 years of age or older.

By signing below, I acknowledge that I have read, understand, and agree to the information outlined above.

Signature of participant

Date

Signature of researcher

Date

C Focus Group Session Protocol

Materials: Consent forms

Method:

- Greet group, hand out the consent form.
- Allow time for the group to read sheets and ask questions.
- Collect the signed forms.
- Tell the group that the purpose of this session is to better understand what people think of using VR technology in long-distance relationships for a more immersive TV watching experience.
- Ask the group whether they have used VR technology before.
- Ask the group whether they have been in a long-distance relationship before (either with friends, family, or a romantic partner) and, if yes, if they ever tried watching TV together with the other person.
- Ask what pain points existed in their method to watch TV with their long-distance friend, family member, or romantic partner.
- Next, cycle through several rounds to discuss what they imagine the virtual socially distanced TV experience should look like:
 - How should the other person be presented? (realistically, as an avatar, placed to the side, placed in front, etc.)
 - What should the environment look like? (customizable environment?)
 - How should audio be presented?
 - Should the experience be gamified?
 - What other features should be included?
- Ask the group what issues they see with this approach to immersive TV.
- Thank the group for their participation and close the group.

D Interview Protocol

Opening statement:

- Give welcoming statements and an introduction of the study.
- Make sure the participant is comfortable.
- Give out the consent form.
- Ask if participants give consent to partake in the session and have their data used.
- Explain the answers will be documented by the note taker.

Question set:

1. Have you used VR technology before?
2. Have you ever been in a long-distance relationship, either romantically or with friends/family?
3. Did you watch TV shows or movies with the person you were geographically distanced from?
4. What methods did you use to watch TV shows or movies together?
5. Did you experience any pain points while trying to watch TV with your long-distance watching partner? If yes, what were they?
6. Imagine that you can use VR to see your friends/family/partner while watching TV in a virtual environment, similar to a virtual movie theater. Would you be open to this idea?
7. Would you want the other person to be shown as an avatar, or realistically like a hologram?
8. Where would you want the person to be positioned in this virtual TV experience and why?
9. What would be the best way to hear the audio from the TV and your watching partner when they speak and why?
10. What kinds of interactions would you want to be able to do with your friend in the virtual setting while watching TV and why?
11. Why or why not would you like this shared virtual TV experience?
12. What problems, if any, do you see with this shared virtual TV experience?
13. What suggestions do you have for this shared TV experience?

Closure:

- Ask whether the participant has anything they want to add.
- Reiterate that their data will be used for the research, in line with the consent form.
- Thank them for their help.