

A Grief Farewell Scene Design for Children Based on Virtual Reality

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ABSTRACT

The global outbreak of Covid-19 causes a large number of casualties. Due to the suddenness and infectivity of virus, the bereaved were unable to say goodbye to the deceased. This leads to a series of psychological disorders of grief. In response to the above problems, a virtual reality(VR) grief farewell scene is designed to help bereaved children bid farewell to their deceased relatives and regain their confidence in life. To verify the effectiveness of the scene, 30 respondents were recruited by us to conduct a user experience survey. To a certain extent, the results show that grief empathy can be aroused by our design and the VR scene can assist subjects to vent their emotions and complete grief cognitive education. In terms of user experience, the scene fluency and refinement are basically intact. In future work, the VR grief scene design will be improved and more in-depth research on grief counseling will be conducted.

Keywords—Grief Farewell; Virtual Reality; Children; Bereavement.

1. INTRODUCTION

Since 2020, Covid-19 has caused the death of some infected people and brought great mental distress to the bereaved which may lead to post-traumatic stress disorder (PTSD), prolonged grief disorder, depression, mental breakdown and suicide. If appropriate psychological treatment isn't carried out in time, it will cause serious consequences.

Traditional psychotherapy mainly includes psychotherapy courses and psychological counseling. Virtual reality technology is a new psychotherapy means which has the advantages of not being restricted to time and space and reducing the risk of viral infection. Virtual reality technology has been used to meet the living and dead by some VR companies. However, customizing the virtual characters of the deceased often requires vast time and cost so it has not been widely used and popularized.

In response to the above situation, we designed a grief farewell scene based on VR technology, and provided patients with a virtual experience of farewell to their deceased relatives to help them express their bad emotions and face their new life actively.

2. RESEARCH ON PSYCHOLOGICAL EVENTS AND TREATMENT OF BEREAVEMENT UNDER COVID-19

2.1. Grief psychological mechanism behind bereavement during the epidemic

Bereavement refers to the loss of beloved relatives. Grief is the reaction and process of the bereaved when they lost their loved or dependent object (mainly relatives), including grief and mourning reactions.^[1] The epidemic has resulted in the accumulation of bereavements, uncompleted mourning procedures, unpredictable spread of the virus and limited medical equipment, all of which have exacerbated the difficulties of coping with grief for the bereaved.^[2]

2.2. Bereavement counseling process

Bereavement counseling aims at the bereaved who cannot transit from acute grief period to integrated grief period. With the help of professionals, they can complete emotional catharsis in a reasonable time, so that they can regain their life. At present, there are three major technical methods of bereavement counseling, which are empty chair technique, role-playing and safe deposit technique.

2.3. Design principles of grief farewell scenes

In the process of grief counseling, due to children's immature physical and mind, they are more likely to have physical and

psychological problems. Unresolved bereavement will hinder the psychological development of children.^[3] According to investigation, expressive therapy can deal with their loss in a more comfortable way than talk therapy. Therefore, the subjects are set as children of the ages between 4 and 11 who have experienced the death of their loved ones in our design.

Based on bereavement counseling methods and the characters of VR and children, the VR grief farewell scene should follow three principles: Firstly, blank space should be properly left for patients' imagination according to the empty chair technique. Secondly, the space and sound of VR should create a quiet and private environment for patients to express their feelings. Thirdly, some elements can be designed individually for different patients to help them better imagine.

3. DESIGN OF VR CHILDREN'S GRIEF FAREWELL SCENE

3.1. Element research of farewell scene

Our element research is conducted in terms of style, color, image and text plot.

Style and Color design: We take Wuhan, an area with severe epidemics in the early stage, as an example to carry out our design. Cherry blossom is chosen as the main element of the scene because it can promote emotional relaxation and evoke the feelings of happiness of the respondents.^[4]

Image design: Our design chooses butterfly to replace the image of relatives since it is universal and contains special meanings of freedom, life and pleasing wishes in Chinese classical culture.^[5]

Text plot design: In the process, the voice of target subject (representing the mother's image) is selected as the main element to guide children to communicate and think, induce emotional catharsis and guide emotional recovery. During the interaction process, users experience can divide to four stages, which are peaceful introduction, emotional venting, cognitive correction and ceremonial farewell, so as to help patients express the negative emotions caused by bereavement and start a new life with a more positive point of view. Soothing music, dialogue with mother and stories are used to educate patients, change their misunderstandings, and achieve grief healing.

3.2. Unity scene construction

3.2.1. Scene construction steps

The development of the virtual scene is divided into three parts: material design, interaction design and output, as shown in Fig. 1. The main components of the development process are described below:

First, Terrain Creation Toolkit are taken to create rolling hills terrain. Then, vegetation such as cherry trees and thickets from the Unity plant resource pack are added to the terrain. Next, detailed animations are added to the elements in the scene such as the slowly swing with the ambient breeze and the petals with falling motion. Finally, the scene construction is completed.

3.2.2. Route planning

Detailed description of the scenes during the tour is as follows:

Initially, with the presence of music and mother's voice, the subject comes to a cherry blossom forest and a butterfly appears (a). Then, the butterfly moves among the cherry blossoms, mother begins to talk (b). Following the butterfly, the subject reaches a scene of cherry blossoms with pink grass. Mother expresses her feelings and the subject enters the stage of emotional venting (c). The subject comes to a high open scene and enters the stage of cognitive correction (d). Mother begins to say goodbye to the child (e). Finally, the subject returns to the vicinity of the starting point (f). And the treatment ends with the song of Nobody loves me like you do.

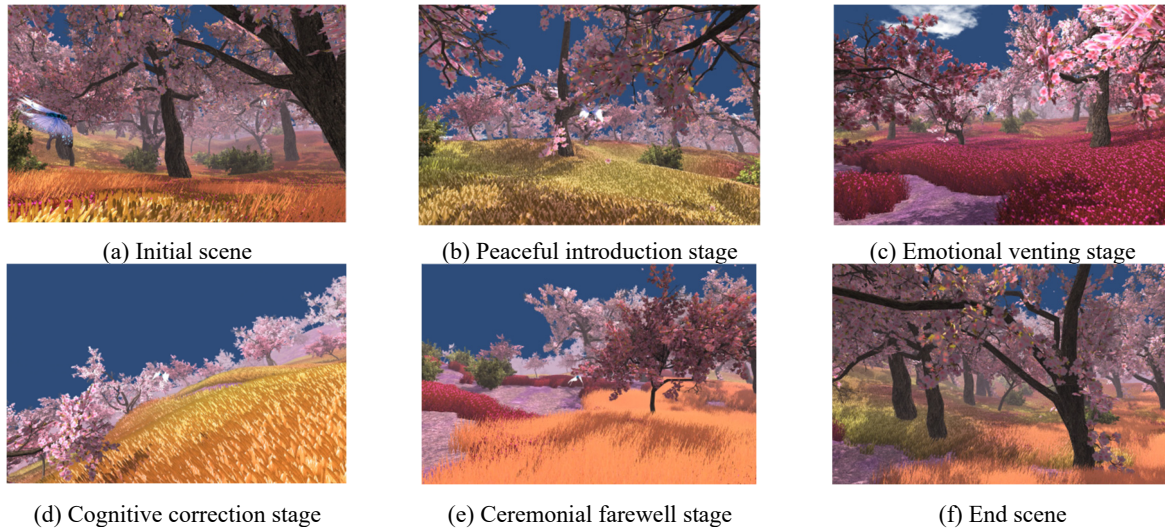


Fig. 1 Snapshots of the designed scene

4. EXPERIMENT AND RESULTS

We established a survey to test user's experience of the designed VR scene. Because bereaved children are difficult to find and it may cause some unpredictable harm to them, 30 adult subjects (15 males and 15 females, age: 18-37 years) were recruited for a questionnaire test under our guidance.

We set up a user experience questionnaire containing 9 topics in Table 1. Numbers from 1 to 10 is given to indicate the user's feeling intensity to each item. The subjects were asked to fill the user experience questionnaire after watching a full view video of our scene design.

Table. 1. Questionnaire results

Title	1	2	3	4	5	6	7	8	9	10	Mean
The role of substitution	0	0	2	3	5	8	9	2	1	0	5.96
Emotional immersion	1	0	1	1	4	6	10	4	3	0	6.43
Emotional catharsis	0	1	1	0	14	6	3	5	0	0	5.73
Degree of miss	0	1	1	1	2	6	5	10	3	1	6.90
Degree of relief	1	0	2	2	8	3	5	6	3	0	6.10
Confidence in future life	1	0	1	4	2	7	7	6	2	0	6.23
Scene fluency	2	1	0	3	6	4	5	4	5	0	6.07
Scene naturality	1	1	4	4	6	6	2	3	2	1	5.43
Scene vertigo	7	1	3	1	0	2	8	5	2	1	5.27

The user experience is generally quite good, the average score of all items are more than 5 points, and five items are more than 6 points. Degree of miss has the highest score, which is 6.9 points. Scene vertigo has the lowest score, which is 5.27 points, indicating that the scene experience is good.

5. CONCLUSION

Based on the the results presented above, the conclusion obtained as below:

To a certain extent, our design can arouse grief empathy, assist subjects to vent their emotions, and complete grief cognitive education. In terms of user experience, the scene fluency and refinement are basically intact. In future work, we will continue to improve the scene and a clinical trial will be conducted under the guidance of doctors.

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