

Daydream: A Healing Game for Mitigating Quarantine-induced Negative Emotions with Music Adventure

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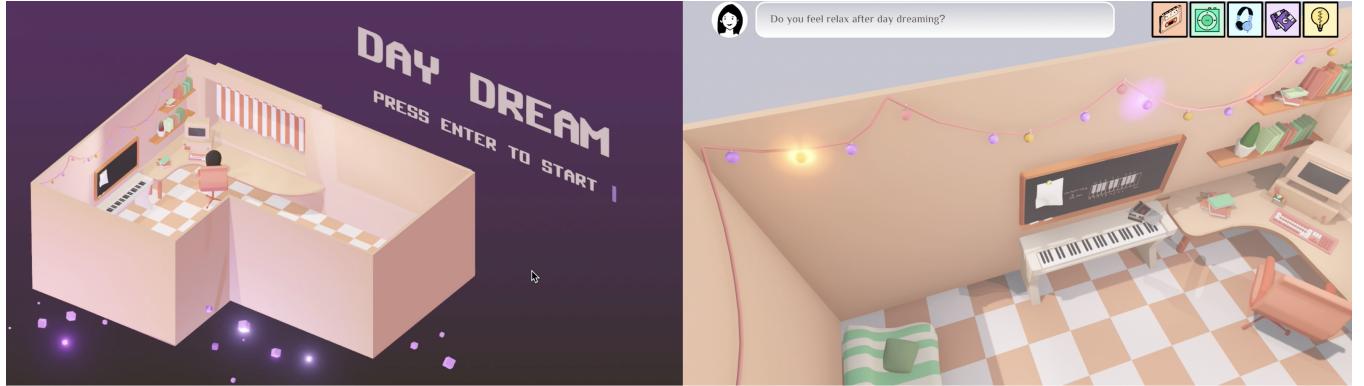


Figure 1: Visual Design Style: The beginning scene before the player enter the actual room (left). Icons for to-be-collected objects are all colored when they are all collected in the right corner (right).

ABSTRACT

Many people all over the world still suffer from the stress induced by quarantine and social distancing during the coronavirus outbreak, and it is a topic of significance to manage negative feelings and emotions when considering mental health and wellness. Our questions are: "Can a game help people maintain mental health and wellness in such a situation?" and "Will virtual escape from isolation in the game help people feel better in reality?" Therefore, with the design concept of a "healing game", we developed *Daydream*, a game that combines puzzles and interactive music-making experiences with the design concept of a "healing game" to help players slow down, relax, and imagine. In *Daydream*, players collect magic objects that can retrieve the main character's memories and unfold her imagination, allowing players to enter a musical adventure. While this research project is still in the early stage, we conducted a preliminary user study and the feedbacks from the participant were generally positive to our design concept and game design. We believe such a design concept of a "healing game" would be promising as an interesting research topic in serious games.

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CCS CONCEPTS

- Human-centered computing → Human computer interaction (HCI); Interaction design;
- Applied computing → Media arts.

KEYWORDS

serious game; mental wellness; interactive music experience; imagination; game design

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1 INTRODUCTION

Due to the coronavirus outbreak, many people around the world are experiencing a "new normal" [9]. People must practice a way of life that they are not quite used to yet, such as social distancing, quarantine, and working from home. Under such conditions, we need to take extra care to avoid the risks of experiencing negative feelings and emotions, such as stress, frustration, and depression [4, 6]. Can a game help people better maintain their mental health under such a difficult situation of a new normal? If we design a game to reduce people's stress under the new normal, how should it be designed? Will virtual escape from isolation in the game help

people feel better in reality? To investigate these issues, we designed *Daydream*, a serious game¹ intended to provide a shelter for players to take a break from the hard days, calm down, and develop a better mental state.

In *Daydream*, players start by exploring a typical room that simulates our new normal of quarantine life. Through discovering and collecting objects that may be linked to common, everyday life experiences and memories that most people share, players can teleport from the room to an imaginary world relevant to each collected object. With such a game design, we intend to provide interactive music-making and dreaming experiences, aiming to "heal" players with music-making and imagination.

Although our project is still in the early stages of investigation, we have conducted a preliminary user study, and the feedback from the participants was largely positive and constructive. We believe our work could be a rare design exemplar of serious games intended to support mental health and wellness under the coronavirus outbreak. We are currently planning further investigation into this research topic and game design.

2 RELATED WORK

2.1 Serious Games

Serious games refer to games that are not primarily intended for mere entertainment [18]. They are applied in many fields, such as defense, education, scientific exploration, health care, engineering, and politics [1]. There are even games designed to help players learn about harsh realities that refugees face [14] and to help players develop an aesthetic appreciation of Chinese poems [10]. There are also several examples of serious games for mental health [8]. As we describe later, *Daydream* aims to help improve mental health and wellness under the situation of the Covid-19 pandemic.

2.2 Healing Games

In contrast to games that deliver "hard fun" by providing players with a sense of control and task achievement, "healing games" exist for the sake of calm, relaxation, and de-stressing. In *Abzû* [17], players discover deep ocean through beautifully rendered ocean environments with fluid swimming controls and calming music. Fujii [19] provides players with a magical adventure through a lush, chromatic VR wilderness. By collecting seeds, the players can unlock a hidden landscape. In *Flower* [20], players enter each flower's dreams and control how a flower petal flies through the wind to activate other flowers' blooming.

While these healing games have diverse game concepts and designs, it seems that there can be found some common features, such as healing music/sound, "open-ended" experience, and fantasy world adventure.

Sound and music play a key role in healing games and help people relax. According to a study on the characteristics of relaxing music, a tempo in the range of 80–100, a secure melody, a regular beat with

a 4/4 time signature, harmonies with standard tonal progressions and the common triadic harmony, a simple rhythm, low complexity, and a narrow note range are the features relaxing music should have [7]. These features can be confirmed by the music design of healing games, which usually uses orchestra pieces and slow, soft, and harmonious features. "Open-ended" experience is usually found in games where there are no time-limited tasks or combat fighting. Without goal-oriented tasks, players may immerse themselves easily in the fascinating game scenes, relax with calming music, and enjoy the exploration. The last common feature is that healing games provide a spatial place with magic and fantasy that players might not experience in real life. For instance, players can swim in the ocean, explore a beautiful sea world, become a flower and fly with the wind, and explore a hidden world with music.

3 GAME CONCEPT

3.1 Story

The main character, Jessie, is a programmer who has a logical brain and deals with numbers and codes. However, she also has all kinds of whimsical ideas from lying on a cloud to roaming in the starry night. She likes music, cute things, and daydreaming. During quarantine, like everyone, Jessie has been in her sweet home for so long. She has to write code for work at a normal pace, and she tries to maintain a good mood. However, one day, Jessie finds portals that lead from her room to magical worlds.

3.2 Game Design

As a first-person exploration game, the player will enter Jessie's room and look for clues to experience the magical travel Jessie found by collecting magical objects. To encourage players to slow down and invoke happy memories through retrospective nostalgia, we introduce travel through retro belongings, which will be elaborated in the following section. A cassette tape, MP3 player, headset, disk, and light bulb should be found to invoke the events relevant to Jessie's past memories and imagination, such as singing on a road trip, dreaming about a wonderland, and solving "register problems" by guiding cars into a parking lot.

3.3 Visual Design Style

The visuals design of *Daydream* is created in a cute and dreamy style so that it can represent the player's fairy tale-like backyard. The 3D models are in a low-poly style to enhance the cute vibe, while the ice cream color palette is used to create a relaxing, warm, and home-like vibe. Figure 1 shows the general visual style of the game.

Game assets are mostly in 3D, while the UI system uses 2D sprites. 3D assets required in the game were modeled, textured, and animated in Blender, while UI assets were made in Figma. The UI window was designed in the shape of a console. The player can interact with the UI window by clicking the mouse. The HUD (head-up display) shows the key objects' logos (i.e., a cassette, MP3, headset, disk, and light). If the player obtains the corresponding object, the logo will change color from black. The HUD serves as a reminder or tip to guide the player in finding key objects to prepare for the next magical travel.

¹a game used for purposes other than mere entertainment [18]

4 GAME FEATURES

4.1 Travel Through Retro Belongings

Travel through portals seems common in games, such as in Portal, The Lab, and Bridge Constructor Portal [16, 21, 22]. Whereas portals are often a transparent mirror with sci-fi features, Daydream uses retro-style objects (i.e., a cassette tape, MP3 player, headset, disk, and light bulb) as shown at the top of Figure 2. With the intention of reminding players of the past, using the retro-style objects could help reduce stress regarding the uncertain future due to the Covid-19 pandemic. Many people are experiencing job hunting rejections, health-related fears, and uncertainty-induced stress. Under the current situation, retrospective nostalgia may lead to reflection on happy memories and feelings from the past [3, 5, 13].

4.2 Interactive Music Playing

Music is generally considered beneficial to easing one's mind [11, 12, 15], and it plays a significant role in the design of healing games, as described in the previous section. Furthermore, the combination of interactive music experiences and game elements can provide a way for players to pursue optimal feelings. Therefore, we integrated an interactive music-playing experience to help players relax and engage. As shown in the middle of Figure 2, players are instructed to accompany the vocals of the main character, Jessie. Since the game provides a certain degree of flexibility in playing the virtual piano, players with musical experience can creatively explore the accompaniment session, while players who don't play instruments in real life can still participate in the accompaniment session by following the instructions.

4.3 Visualization of Past Memories

Music has strong links with memories [2]. For example, hearing a song from a previous playlist can take you back in time and retrieve the sights, sounds, and feelings of a specific event. Previous study showed that when people listen the songs in their music history archive, their episode memory associated with each song was retrieved.[13]. In this game, the author tries to use the concept of the connection between music and memory to build the travel destinations. For example, a scene generated from Jessie's memory is shown at the bottom of Figure 2.

5 IMPLEMENTATION

5.1 Target Platform

This game was built in Unity3D², which is able to compile the game in multiple platforms. The executable game demo for macOS and Windows can be played with the following links.

- macOS
- Windows

The demo video can be accessed here: <https://youtu.be/278pOS7nCTw>.

5.2 Game Flowchart

The suggested gameplay flow is shown in Figure 3. Players will find a cassette on the piano, which will trigger the interactive music accompaniment experience. After players finish accompanying

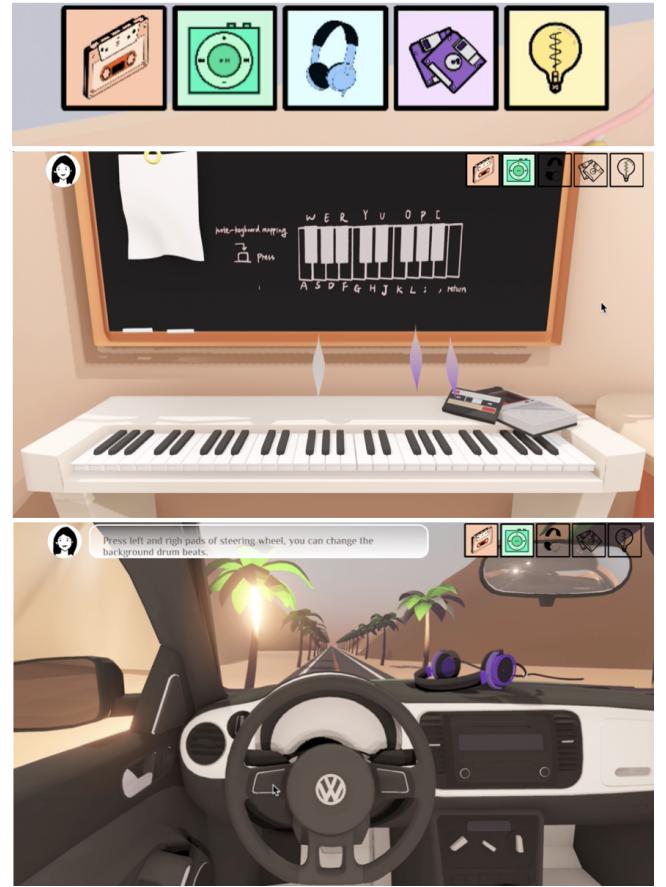


Figure 2: Game innovation highlights: The icons are the guiding icons for retro objects (top); the game provides highly flexible music accompaniment experience for players (middle); Jessie's past memory of road trip is retrieved and visualized (bottom).

Jessie's vocals from the cassette, a road trip memory will be retrieved and players will teleport from the room to a car scene. Once players get a headset in the car, they can plug the headset into an MP3 by the bed to listen to the music, which will cause players to enter a dreamland. In the dreamland, players can get a disk, which can be inserted into the computer in the room to enter the virtual computer world. By dealing with real-life "register problems" through arranging the cars in a parking lot in the virtual world, players can finally succeed in debugging for Jessie and finish this magic journey.

5.3 Supplementary Scenes Description

The scenes of dreamland and virtual city will be described here. As shown at the right part of Figure 4, when players enter Jessie's dream, they will travel on the lake with moon boat. While they go by rainbows and tree land, ambient music will change with different locations. In the virtual city, shown in the left of Figure 4, players will choose cars and then place them in different parking

²<https://unity.com/>

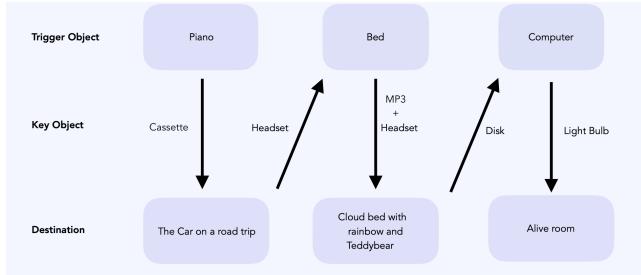


Figure 3: Game-play flowchart



Figure 4: Rest of scenes: Players control the cars into parking lot while making music (left); players will explore the Jessie's dreamland through moon boat (right).

slots. While each car can generates customized sound, when players finished parking all the cars, a drum loop will be created.

6 PRELIMINARY USER STUDY

Ten participants were asked to play the demo of this game. We designed a questionnaire with open questions to obtain users' feedback. Most participants gave positive feedback, stating that they felt engaged with the game environment through the interactive music experience, target-object finding, and portal traveling, which reduced stress in a relaxing and playful way. Some comments pointed out that since there were a lot of retro objects in the game, such as the cassette, MP3 player, headset, and disk, the participants were reminded of their own retro belongings, recalled past memories, and charged themselves in this period of time. Some participants said they would try to imagine an elaborate world before bed while listening to music, as they did in the game, because they felt it would be a good way to find peace, relax, and heal themselves. For the question of "Will virtual escape from isolation in the game help people feel better in reality?", 8 participants gave the positive answers, and some said imagination can help escaping, but they had motivation to make real-life more dream-like.

7 CONCLUSION AND FUTURE WORK

We developed Daydream as a serious game to help people mitigate stress during quarantine life. We believe that such a game can provide a shelter for players to take a break from the hard days, calm down, and develop a better mental state. Daydream is still in the early stages of development, and we are currently re-designing and extending the game based on the feedback from the preliminary user study. For instance, we may re-design the virtual digital city so that the game experience of arranging cars in the parking lot is

more impressive. We will also polish the scene transitions so they flow more naturally.

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