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Gone

Logan M. Harrington
Worcester Polytechnic Institute

Sean P. Calvert
Worcester Polytechnic Institute

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Gone

Interactive Media and Game Development

A Major Qualifying Project Report

Submitted to the faculty of

Worcester Polytechnic Institute

In partial fulfillment of the requirements for the

Degree of Bachelor of Science

By:

Logan Harrington

Sean Calvert

With:

Cian Rice

Jake Hawes

Advised By:

Professor Britton Snyder

Professor Keith Zizza

Professor Ralph Sutter

Abstract:

Gone is an Interactive Media and Game Development Major Qualifying Project completed at Worcester Polytechnic Institute. It is a first person, 3D survival game where the player is thrown into the mind of a mentally ill person. They must survive the journey through a house whose rooms are a visual metaphor for the symptoms and emotions of three mental illnesses: depression, anxiety and posttraumatic stress disorder. They must survive and conquer the struggles of living with a mental health concern. Each mental issue is represented by a different room and situation. By the end of the game they should know the daily struggles that these illnesses harbor and the difficulty of conquering those struggles so they can move on with life.

Gone was largely an artistic game that underwent several months of artistic development and the final term was devoted to polishing art assets, scripting and programming game mechanics, sound design, and testing.

Acknowledgements:

We would like to thank our advisors, Professors Snyder, Professor Zizza, and Professor Sutter for giving us direction, advice, and guidance on this project. We would also like to thank Jake Hawes and Cian Rice, without whom our project would not have been completed thanks to their numerous contributions during C-term. We also extend our thanks to Sasha Abdurazak and Charlie Morse for their advice and input on the portrayal of each mental health concern.

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Introduction:

Gone is a first person, experience driven, serious game. The player must go through a house, which is a metaphor for their mind, while being chased down by a monster, representing their fears and issues. The player will need to navigate these rooms and challenges to overcome the mental health concerns represented by the rooms.

The inspiration for this game comes from a person that has suffered from a mental illness and has seen others suffer as well. Awareness of these issues needs to be spread because individuals suffering from a mental health issue can be misunderstood and bullied for simply trying to live day by day. Not everyone knows the warning signs or knows what it's like to endure a life haunted by such an illness and not everyone understands how difficult it can be to overcome those hardships and just live a normal life. We wanted to make a serious game that was both informative and fun, but above all we wanted to make a game that would leave a lasting impression on the player and instill a sense of awareness and hope that there is a way out and way to beat your demons.

Background:

For this project we wanted to create a tool to allow people who know individuals with a history of mental health issues to empathize with those concerns. To do this, we sought to gain a better understanding of the concerns themselves, such as what it feels like to be depressed and how professionals in the field would think these issues could most accurately be portrayed. After we had chosen a list of concerns that we considered to include in the game we consulted the WPI SDCC, Student Development & Counseling Center, where we talked to the Director of Counseling Charlie Morse. He provided us with a plethora of insight regarding how these mental health concerns affected people and how these effects could be portrayed in a game.

To begin things we talked about depression. Now, according to the Diagnostic and Statistical Manual of Mental Disorders (DSM), depression is not defined by any one symptom, but by many including being sad and irritable, losing pleasure in normally pleasurable activities, fatigue, lack of concentration, and reduced energy. These are just some of the symptoms used to define depression in the DSM. Now looking at this from a game design viewpoint, these are not easy things to make a player feel while playing a game. Thus, we needed the help of Dr. Morse in how we could make a player feel these things. First off, was the feel of the room itself. We needed the experience be dark, slow, and make the player feel trapped. So, with his help, we decided on the color scheme of the dark blues, blacks, and grays seen in the level. We also came up with slowing the player down to make the level more sluggish and give the user a sense of fatigue. In terms of coming out of depression, Dr. Morse told us that the best and easiest (though still not easy) way of coming out depression was by reconnecting with something such as family, friends, or work. With this knowledge we focused on having the player reconnect with a family,

using (a vague picture that is too blurry to really make out anything about.)

Next we talked about the symptoms and possible representations of anxiety. The DSM defines many different forms of anxiety, but the common symptoms are excessive worry, overwhelming fear, loss of control, and a sense helplessness. To try to convey these feelings, we considered many different gaming clichés including the increased heartbeat and noises coming from sources you can't see. But these clichés are effective at making the player feel very anxious so they are in the game. More challenging was the sense of helplessness. To get a player who is controlling the actions of a game is much harder than getting the players pulse quickening. But with Dr. Morse's help, we came up with a solution involving a way to “beat” anxiety. The analogy that Dr. Morse used to describe anxiety was that you felt like you were in a tug of war over a rope that you could never win, and the only way to win in the tug of war is to let go or cut the rope. So we added in the rope pull to make the player feel helpless as they would get dragged along the floor and the only way to beat that puzzle would be to cut the rope.

In talking to Dr. Morse we realized that these two overarching mental health concerns cover about 90% of the patients that visit him. But we wanted to add in as many specific things that people have a hard time empathizing with such as PTSD, social anxiety, and eating disorders, so we talked to him about those. PTSD, were we told, was about reliving a nightmare. These experiences would be hyper-real for the sufferer and that during these periods the sufferer would be very disconnected from the rest of the world. In talking about how to portray these feelings we ran into a couple of stumbling blocks as getting each person to re-experience a traumatic event isn't exactly something that we can do in a game. However, we did try to add in elements of the hyper-arousal and disconnection, by having sounds and sights be more vibrant and by the player’s vision narrowing making the room seem longer than it really is.

The two elements that didn't make it into the game were eating disorders and social anxiety. These were excluded as much for time constraints as they were for execution reasons. These are things that every individual experiences differently and we would never have been able to come up with a way for people to empathize with these concerns in the time we had available. For social anxiety, we learned that it is more about a self-evaluation where you put an extreme amount of pressure on yourself about how to deal with a situation. This causes the sufferer to not be able to perceive external stimuli as well and makes them go very rigid. For eating disorders, we learned that these are effected by depression and anxiety as they revolve around an obsessive internal pressure about feel that your body isn't good enough. And that it stems from the loss of control and self-hatred. Despite learning about these things from Dr. Morse, these concerns were too complex to be translated into the game in the time that we had available; and were left out of the game.

Depression

The official name of what we typically call depression is a Major Depressive Disorder. This is a mental disorder that is characterized by multiple symptoms. The main symptoms of the disorder are a persistent low mood, lack of self-esteem, lack of energy, and the loss of interest in activities that the person with the disorder used to find enjoyable. To be clinically depressed, the patient's symptoms must be so severely disabling that they are adversely affecting the patient's social and personal lives. A major depressive episode may be diagnosed if the severely depressed mood persists for more than two weeks¹.

¹ *Diagnostic and Statistical Manual of Mental Disorders: DSM-IV-TR*. Washington, DC: American Psychiatric Association, 2000. Print.

While there is no specific treatment for depression, there are some things that seem to help. First off, depressive episodes have a tendency to resolve themselves over time whether treated or not, but when they are not treated, there is a high recurrence rate. There are three common treatments for depression: psychotherapy, medication, or in extreme cases electroconvulsive therapy. The most common of the treatments is psychotherapy which consists of meeting with mental health professionals. During these sessions there is a tendency to try to change the patient's outlook using multiple methods that has them express their negative thoughts and issues and then try to look at these issues with a positive outlook². Another major method of dealing with depression is reconnection, whether it is reconnecting with work or with a friend or family member, in an attempt to look more positively at their lives.

Anxiety

Anxiety disorders have a large variety of classifications including: generalized anxiety disorder, phobias, panic disorder, social anxiety disorder, obsessive compulsive disorder, post-traumatic stress disorder, or separation anxiety. Generalized anxiety disorder is a common disorder characterized by persistent fear or worry on a non-specific object or situation. This excessive worry causes restlessness, fatigue, irritability, concentration issues, and sleep disturbance. Phobias cause a debilitating fear in reaction to a certain event or stimuli. Panic disorder is characterized by recurrent unexpected attacks of intense terror marked by trembling, confusion, dizziness, nausea, and difficulty breathing. Social anxiety disorder is the debilitating fear of negative public scrutiny or humiliation. This is the disorder typically associated with the fear of public speaking and causes intense sweating and difficulty speaking. OCD is characterized by repetitive and uncontrollable obsessions and compulsions that can put their lives

² *Diagnostic and Statistical Manual of Mental Disorders*

on hold. PTSD will be covered separately. Separation anxiety is excessive levels of anxiety over being separated from a person or place, but while this form of anxiety is common and expected during childhood development to some degree. More debilitating forms of this can appear in adults as well as some children, and these forms can cause intense panic episodes³.

Similarly with depression, there is no specific treatment for any of the forms of anxiety, but the things that tend to help are therapy and medication. The most common therapy for anxiety disorders is cognitive behavioral therapy. This therapy is essentially attempting to change the thoughts about certain situations and by modifying the patient's behavior to be more problem focused and action oriented. So to be able to focus on what is causing the anxiety and how to deal with it. Medication can also be used to combat anxiety, but it is only used if therapy has failed because of the risk of side effects and the restrictions associated with many of the drugs⁴.

Post-Traumatic Stress Disorder

Post traumatic stress disorder (PTSD) is a common anxiety disorder. It is typically characterized by exposure to a traumatic event, re-experiencing the traumatic event, avoidance and emotional numbing, hypervigilance, duration of the symptoms, and impairment of normal life caused by these other symptoms. PTSD can be caused by a variety of factors ranging from family violence to foster care to wartime trauma⁵.

As with, anxiety and depression, PTSD has had many forms of psychotherapy advocated for it, however, many treatments have little to no evidence supporting their efficacy. Still the attempted methods of therapy are cognitive behavioral therapy, used for the same reasons as they are in anxiety, and eye movement desensitization and reprocessing, which is meant to control the

³ *Diagnostic and Statistical Manual of Mental Disorders*

⁴ *Diagnostic and Statistical Manual of Mental Disorders*

⁵ *Diagnostic and Statistical Manual of Mental Disorders*

association between rapid eye movement and distress about a certain memory. Studies have shown that while thinking about disturbing memories people's eyes move rapidly. This therapy is designed to teach to patient to bring their eye movements under control while thinking about these distressing situations. This has been shown to make the thoughts about the traumatic experiences less disturbing. However, given the questioned efficacy of these two main treatments many sufferers of PTSD are only able to control the symptoms as they happen instead of solving the underlying issues. These symptoms are controlled by a plethora of drugs that each have their own side effects and downsides that can create as many problems as the disorder itself⁶.

⁶ *Diagnostic and Statistical Manual of Mental Disorders*

Development of Concept:

The main idea of our MQP was to educate others about mental illness and how they affect the lives of the people who suffer from them. We were unsure of how exactly we would accomplish this, and our project went through many stages of development that eventually formed into the game we have now.

Initially, our idea on how to convey this message was through a series of short videos that showed the everyday struggles the mind must endure with a mental affliction. These videos would be created using digital 3D software such as Maya, Zbrush, and Adobe Premier. Depression, for example, might have been about a person trapped in a glass room unable to get out but able to see the world moving on around them. The viewer would be viewing the scene as an outside force as opposed to being the person themselves. The videos would be meant to invoke an emotional response and make the viewer feel what the person in the video feels. This interactive type of video experience would have included several different scenes for about three or five different mental illnesses. The user would be able to choose which video of a mental illness they wanted to watch when and have access to health and psychology information as well. Our plan to show this type of project was through YouTube or a museum installment.

As we started to further plan our project we decided to change the medium entirely and convert our idea into a game. This was a major change to our project that we decided to make for several reasons. The major reason was that our MQP could be used as a portfolio piece and experience to help us get a job in the game industry. We also wanted to utilize all the skills we

learned in the Interactive Media and Game Development program to create a great project. And now that our idea had evolved into a game, it could be entered into several game competitions in Massachusetts.

With our project undergoing a drastic change, our MQP plan had to be reevaluated and we needed to start designing a game. This change occurred at the beginning of A-term so no time was lost on our project development. The game concept and mechanics remained pretty much the same from the beginning but the aesthetics and level layout changed from time to time. Like our original idea of emotional videos, we wanted users to feel as if they themselves were suffering and what better way to do that than to put them in the situation themselves with a first person game. We originally planned for five mental illnesses to be represented in this house but scaled back our idea to three so that we could finish the game and polish what we had. We also originally planned for the house to be a haunted and run-down house but we also changed that idea to reflect the notion that anyone in any house could suffer from a mental illness, even a nice modern house.

As our project progressed, our level was changed and refined several times. The room layout and room type changed at least three times during the course of A and B terms as the style and number of rooms changed along the way. At the end of B term we had finalized our game design and level layout and focused on finishing our game to that model. Since that time, our design has not changed and we are happy with the outcome of our game.

Characters:

The monster character was designed as a visual metaphor to represent the demon that haunts a person's mind. The being that is the voice in the back of your head telling what you can and cannot do. Feeding you negativity and hopelessness. It is not the typical red demon but instead a more realistic horrifying monster. It has dark skin with long arcing horns, sharp teeth, black eyes, and a long



tail. The character design was original and intended to scare the player. The character design was also designed to have a distinct silhouette so it could be easily recognizable in dark areas of the house such as the room that represents depression.

The monster was modeled, painted, and UV mapped in Zbrush. It was retopologized and made game ready in Zbrush. The rigging and animated of the character was done in Maya..

The second character modeled for the game was the player character. The game is first person but a player model was considered because the camera may be able to see its own body in certain parts of the game. In the anxiety room, for instance, the player is being dragged across the ground by a rope they are holding. It would make sense for the player to be able to see their hands and feet as they battle the monster.

The player character was designed to be as ambiguous as possible so the model couldn't



modeled in Zbrush and rigged and animated in Autodesk Max.

It was decided, however, that the player character model would not be used. This decision was made because as time ran out the team figured it would be easier to animate the camera within the game engine instead of rigging and animating an entire character model and importing it into Unity.

infer gender, age, or other characteristics. These choices were made so the player can become more immersed in the game themselves instead of pretending to be someone else. The character model was designed with a pair of jeans, gray sweatshirt, black sneakers, and a pair of hands but had no need for a head since the camera will never see it. The player character was

Environment/Setting:

The overall setting of the game is a modern day house with no one else inside. The reason a family house was chosen was because we wanted it to represent the person's mind and memories. The house is a physical manifestation of the person's mentally-ill mind. The reason we designed the house to be of a well-off family was to point out that anyone, rich or poor, can be affected by a mental health concern. That is the reason why the game is first person and why our player character is very generic. We chose not to include a distinct character with a history and background. We want the player to feel as if they themselves are in the game and they are the ones going through these rooms. We hope that this will provide a more immersive experience for the player and leave a more lasting impression.

We also chose the modern day looking house because the cliché was to do a setting based around a horror film, and we didn't want the player to be afraid or scared the entire time or feel as if they are in a haunted house. Mental illnesses can affect a person's life anytime and anywhere. Setting the game in a nice well-kept and realistic house reflects that fact. Going from a nice and pleasant room to one filled with fear represents the mental illness taking hold of their emotions at any time. We also incorporated sculptures and imagery into the buffer rooms, the rooms in between those that represent illnesses, in order to keep the player thinking about mental health while not over inundating them with mental health illnesses. The head bust in the foyer, for example, has an open head to represent the open mindedness of the player and the loss of control that comes with a mental health issue.

Depression Room

When the player first starts the game, they begin in the foyer, a bright room with an ominous statue. The only door that is open is the one that leads down into the basement of the house but instead of a typical basement, it is a dungeon that traps the player inside. This room represents depression. A place where hopelessness and despair grip the player. The room is dark and only lit by torches and meager light coming into the room. The player will suddenly move at a slower pace and become lethargic. A slow heart beat can also be heard. There are statues of men being weighed down by large stone balls. This is to represent the weight that is felt by



depression, and how it can prevent you from moving on. The room is also covered with words painted in blood. These are words that a depressed person will say about themselves to bring themselves down. Such words and phrases include: hopeless, trapped, unwanted, and give up. A depressed person can't help but think these things and it greatly affects their ability to function normally. There is also a tunnel entrance at the other end of the dungeon. The player can see to the sunny field outside but is unable to reach it by an unseen force. This represents the

helplessness that those with depression feel. The fact that life goes on around them and that good things happen but they are unable to partake and unable to move on.

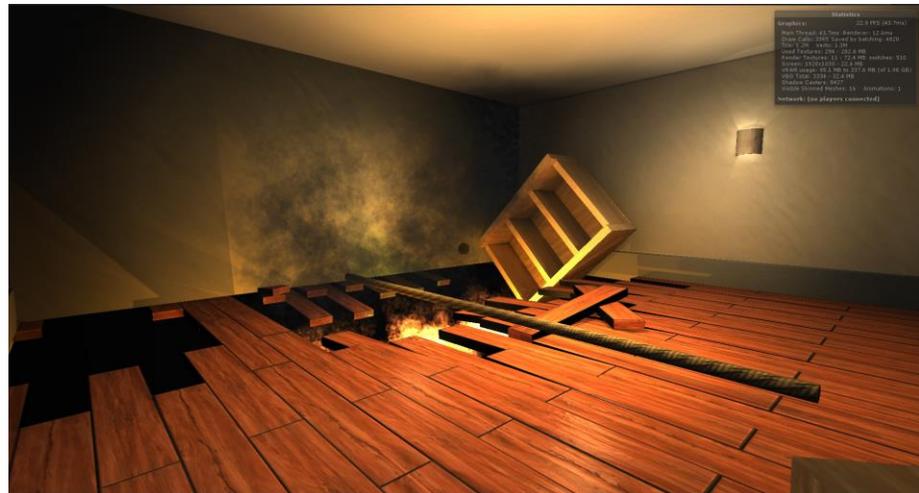
The player is directly affected by making them move slower. The room also has slow and somber music, setting the mood. The only way out of this room is to find a family photo album on the ground. This signifies that the player has reconnected with life and is ready to move on.

Anxiety Room

The anxiety room is the next room that represents a mental illness. In this room, the player will be locked in a tug of war battle with the monster. This is a

metaphor to signify the fast paced trap that anxiety is. The player cannot let go of the rope the monster is pulling them by and must battle their way

out. The player must complete the quick time event by pressing a series of buttons to escape being dragged into the pit of fire. If the player does fall in the pit then they are washed



over with a white light and restarted back to the beginning of the battle. Letting go of the rope and winning the battle signifies the battle with anxiety isn't always an easy one. The battle will also begin abruptly and without warning which is a common symptom of anxiety. The player will hear a fast heartbeat and a narrow field of vision. Once the player is able to free themselves, the monster will disappear and the player will be able to walk across the fiery pit unharmed.

Post-Traumatic Stress Disorder

The player will eventually come to a large hallway that represents PTSD. As they round the corner, they will be forced into a run as the monster chases them. The hallway is filled with portraits, bookcases, taxidermy, and furniture. As the player passes them, they will crash to the floor and the player must hit the correct button to avoid them. This is a metaphor for the player's life collapsing around them with no warning and nothing to stop it. They will see everything they once cared for be run past and forgotten, only leaving the memories of what haunts them. The player will have to outrun the monster and make it to the next room unharmed. During this sequence, the player will have a fast heartbeat, and a very narrow field of vision. They will also

not be able to see very far ahead of them and be disoriented by the crashing objects.



Ending Room

When the player enters the final room, they find themselves back in the foyer. At the other end is the monster and an open door leading outside to a sunny field. The player must face their demon one last time. However, the player cannot fight this demon, they are powerless against it. If they try to walk up to the monster it will push them back. The monster is programmed to do this three times. But the fourth time the player rushes the monster it will disappear and allow the player to exit the house and finish the game. This is to signify that overcoming a

mental illness is not easy but the answer is sometimes obvious. The player must have perseverance and



willingness to get past the monster. Being able to leave the house signifies that the player has defeated their demons and freed themselves from the confines of their mind.

Buffer Rooms

There are a few rooms in the house that act as buffer rooms or break rooms. These rooms include the foyer, the kitchen, and the dining room. We included these rooms in our game to allow the player to take a break from what they experienced and to relax for a few minutes. The player can stay in the buffer rooms for as long as they want and explore the rooms. It is in these room that the player takes a pause from the experience and the game.



The foyer is the first buffer room. It is the first room in the game and acts as a starting point for the player. In the foyer is

just a statue of a head bust with an open head. This was a conscious design decision to tell the player to keep an open mind. It can also be seen as a warning that this game will explore the mind in a different light.

The kitchen is the next buffer room after the player has moved through the depression room. The kitchen is modern and designed to make the player look around. There are several things for the player to find and look at such as the newspaper on the counter, the calendar, the chalkboard, or opening the cabinets.

The third and final buffer room is the dining room. It has a long set table in the center and several pillars with statues surrounding the room. There is also a large statue on the table of the monster breaking out of a human head. This was designed to represent the darker side of a

person's life as they battle their demons.

These statues are foreboding and warn of tougher times ahead. They also act as objects



for the player to look at and explore before they continue on and reach another mental illness room.



Game Mechanics:

During the last term of our project, we brought on a new member to our team that handled all the scripting and programming to implement the game mechanics. The game mechanics for *Gone* were designed to be simple but effective and fun. There is no complicated game mechanic or no difficult puzzles to be solved. The player will be prompted to know what to do in each situation. Although these situations may not be easy to get out of, they will be straightforward and drive the game play in a linear fashion so the player may advance through the level as fast as they can.

Cian was brought in to help finish *Gone* at the beginning of C-Term. His role was to implement the game's mechanics in Unity. While at first this may have seemed like a tall feat, given scope of the game it was actually quite feasible for a seven-week project.

First, there were some positive aspects of programming *Gone*. The game gave Cian much more experience working with new features in the Unity engine that he previously hadn't been exposed to. This comes primarily in the form of the Mecanim animation system, which allows for greater control over animations in Unity. In addition, since the team had a musician, he was able to greater expand his knowledge of Unity's built-in audio components, functions, etc.

Unfortunately, *Gone*'s development was hampered by his illness for about two and a half weeks which effectively reduced development time from circa seven weeks to just over four and a half. This effectively meant that a lot of the code was rushed and, in most cases, not the most ideal. In the coming weeks, the goal is to rectify this with a cleaner codebase and more technical polish. With a bit more work, many small issues such as lack of synchronization between actions and animations can be fixed. Additionally any bugs can be fixed.

Finally, while a powerful machine can run *Gone* in its current state just fine, older and less powerful machines tend to chug quite a bit. The solution for this is really quite simple – adding occlusion-culling areas in Unity Pro would greatly decrease the amount of polygons being rendered on screen at any one time, and greatly increase the performance of the game. The reason there is currently no occlusion culling is due mostly to a lack of familiarity with Unity's pro-exclusive features. This will also be fixed within the coming weeks.

Overall, working on *Gone* was a very rewarding experience that taught Cian more about working with animations and music in games.

The first game mechanic that Cian employed was a search and find mission. When the

player enters the dungeon, representing depression, they are locked inside and prompted to find happy memories to pull them out of the grips of depression. Part of the mechanic of this game play is the character's state of being. They will have narrowed vision, slower movement, and visual lag. The player must then seek an object, a photo album, that will unlock the doors when found and immediately stop the induced depressed state and return their character to normal.

The second game mechanic in *Gone* occurs in the room representing anxiety. This game mechanic is a quick time event that pulls the player into a tug of war battle with the house's monster. The characters vision will again narrow and the player must fight for their life and cut the rope that they are pulling to end the event and continue on. This event will not last long as the player must free themselves or fall into a fiery pit. If the player does fall into the pi, then they will respawn back to the beginning of the battle and try again. Once the battle is completed, they may move on to the next room.

The third game mechanic is also a quick time event but in a much different scenario. Within the hallway representing Posttraumatic Stress Disorder, the player will be forced to run from the monster who is actively chasing them. The player has no choice but to run and if they are caught by not avoiding the obstacles, the monster will catch them and they will respawn at the beginning of the event and must try again. Once the player reaches the next room the event will stop.

The fourth game mechanic occurs in the final room of the game. The player is face to face with the monster who is blocking the only way out. This mechanic is the most simple of all, all he player has to do is wait. After a certain amount of time or events the monster will simply disappear. The player cannot attack the monster but if they try the monster will push them back instantly. After the third time the player tries to attack the monster, it will disappear and allow

the player to advance on to beat the game.

Sound Design:

Jake Hawes, a sound designer, was added onto our team during the last term of our project to add the last immersive element to our game: sound. Jake designed and created three unique soundtracks for each room representing a mental illness. Each soundtrack was specifically tailored to the room's look and game mechanic.

Tools

For music, Jake mainly used Cubase as his DAW (digital audio workstation) and Komplete (a collection of samplers, synthesizers, and effects). All voices and original sound effects were captured with a Zoom H2N portable recorder. Adobe Audition was used both to polish up sound effects and master any music. The vocal recording room in the subbasement of Fuller was also put to good use; the acoustic treatment helped capture very clean sounds without having to worry as much about any background noise.

Music

For the depression room, the team wanted something slow and somber. Jake started with a pulsating low kick drum, and the team suggested that it was reminiscent of a heartbeat-unintentional, but it definitely worked out. The first half of the piece is a bit more melodic, whereas the second uses augmented chords to evoke a feeling of uneasiness or discomfort, which was felt to be appropriate.

The anxiety room music was simple in its final form. Jake originally planned for something more orchestral and involved, but after some experimentation, it seemed best to leave

it more open with just heavy percussion and a more textural background. The driving percussion conveys a sense of urgency, while the evolving electronic background texture brings in an additional layer of tension.

Jake took a more interesting direction for the music in the PTSD room. He used an aural trick known as the Shepard's Tone; it gives the illusion of a constantly rising pitch, and therefore increasing tension. It's actually just one rising tone that resets, but is overlapped by a second offset copy. The two crossfade in such a way that the transition is seamless, giving the illusion of a constant rise in pitch. It was a bit difficult to program a synth patch in Massive that gave this effect, but it came pretty close.

Sound

Jake wanted to record as many original sound effects as he could. A variety of footsteps, doors, and more household-type sounds were relatively easy to produce.

Others took more effort- for example, the monster vocalizations. He recorded one of the team member's voices, then pitched it down and added other processing to make the monster sound more threatening. He ensured to record the vocals at a very high sample rate (96kHz) so that the sound could be pitched down significantly without any perceived loss in quality.

Other sounds were taken from free online libraries, such as freesound.com. This includes anything that was too impractical/dangerous/destructive to record myself, or was done in the interest of time. Some of these include a large fire burning, or several objects crashing violently to the floor.

Schedule and Tasks:

The planning and scheduling for the game was done by Logan who acted as the producer and designer of the game. Because the initial MQP team only had two people, extensive scheduling and planning was not necessary since each team member kept themselves on track. Both artists gave themselves weekly goals and tasks to be completed. What was completed was shown at the weekly meetings with the advisors present to give feedback and suggestions. During C-Term, the team took on a sound designer and programmer. This required more scheduling and planning to compensate for the two additional team members who handled different aspects of the game play. The expanded team met outside the weekly MQP meeting times to work together and create a cohesive experience.

A-Term: For the first term of our MQP, the team immediately started production. We discussed ideas and came up with some rough concept art as well as a rough floor plan for the overall level. Within the first week production was started and assets were being created for the game. During this time, we also visited the SDCC and got the opinions of the Director of Counseling, Charlie Morse, about the possible mechanics and designs for each room. The first room that was done was the depression room. The overall environment, texturing, lighting, and statues for the depression room were created during this time. Most of A-Term was spent working on this location as well as refining the game design. The anxiety room was also started and blocked out, though nowhere near as detailed as the depression room. The monster character was also started by creating concept art and roughing the design out in Zbrush. Several sound effects for the game were also created and edited. The goal for the end of A-term was to have at least two rooms started and the design of the level complete. The depression room was at a good

place to move on but the anxiety room need more improvement and work. A complete version of the level design was also completed.

B-Term: During B-term, the complete level was to be blocked out in unity, at least 4 rooms started, and the monster character completed. It was in this term that the kitchen was completed, the depression room completed, the foyer blocked out, the anxiety room at a decent place, and the monster character completed and ready for rigging. More sound effects were also created for the game. By the end of the term, we had a complete block out of the level in Unity and a good number of rooms started. We completed our goals and were ahead of schedule.

C-Term: During the last term of the project, our game was completed. This required all seven rooms to be completed, the animations done, the player character completed and game ready, the programming and scripting in the game, all sound effects and music created and implemented, and any polish to be done to the art. Luckily, some of these tasks were carried out during the break between B-term and C-term. The last term was started at a good place and the project was continued to be worked on by the two additional team members as well as the two original artists.

Workflow:

Logan: I created the concept of our project idea during the summer and began to brainstorm how we would incorporate my idea for an interactive project into an MQP. I also started creating concept art and rough level design. At the start of A-term I began to create all art assets for our game and continued to create more concept art and designs.

To create all the art assets, used the concept and a design I created as well as find reference images from Google and other sources. I then begin to model the assets in either Zbrush or Maya. I modeled most of the environment and simple assets in Autodesk Maya. For instance, I used Maya to model simple tables and chairs as well as the basic room shape. I created UV maps for the models in Maya and textured them using Photoshop. I usually took textures from CGtextures.com and modified them to fit the asset and the style. For more complex models such as the characters and statues, I used Zbrush. I would sculpt the assets in this program and once the sculpt was complete, I would paint the texture onto the sculpt and retopologize it for the game engine. Once any asset was complete, I would load it into the game engine and place it in the correct room.

I would start by creating the basic room shape first and adding assets on gradually until I got the look and feel of a livable space. If I was having trouble completing a room I would move on to another one and come back to it later. This would allow me to revisit it with a fresh outlook and be able to come up with better ideas.

I came up with the game concept and created all concept sketches, art, and room layouts. I designed, planned, and created most of the environment including all rooms but the anxiety rooms. I modeled and textured all props seen in the game either in Autodesk Maya or Zbrush. I also designed and modeled the monster character in Zbrush as well as the model for the player

character, which was never actually used. I put together all assets into Unity and created all the appropriate lighting and particle systems within the game engine. The programs I used were Autodesk Maya, Zbrush, Photoshop, CrazyBump, XNormal, and Unity.

Sean: In A-term, when we first formed the concepts for this project and began to come up with level designs, I met with the director of counseling at the SDCC, Charlie Morse, for advice on how to portray each mental health concern that we were focusing on in the game. He listened to our ideas of how we would portray each of the mental health concerns we were thinking about covering and how we could improve each of our concepts to better portray an individual having these issue and how they would overcome them. With his advice, we came up with the exit strategy for the depression room, the rope pull event in the anxiety room, the scenario for the PTSD room, and the proper feel we would need for the game as a whole.

After these interviews, I helped with our redesign of each room and the events that would be in each room. With these redesigns I also assisted in the creation of the art assets for the depression room, however most of these were not included in the final game. For the depression room I worked more on the soundscape than I did on the visuals of the room. The ambience was done later by Jake Hawes, but I created the fire noises along with some unused footsteps, monster noises, and some wind and rain sounds. The creation of these sounds was actually quite enjoyable. For the fire sounds I used the sound room in the basement of Fuller to record and made the sounds by using paper bags. I crumpled the bags for a certain amount of time and then combined three different tracks of the crumpling noise. Then I pitch shifted it up or down and phase shifted the tracks to create different versions of the tracks. These different tracks are placed on the torches in the depression room and then combined into the fire in the anxiety room. The footsteps I created had issues with quality of the original tracks from the microphone so they

were not implemented. The monster noises were created in a variety of way to allow for us to choose the most appropriate sounds. Many of the growls were created either by actually growling straight into the microphone or by growling into various things, either my hands, a paper towel roll, or a bowl, into the microphone. These objects all created different effects and reverbs on the growls and when combined with a pitch shift these growls and grunts sounded downright monstrous. The wind was created by simply blowing through a paper towel roll into my hands. This process didn't even need to be pitch shifted as it sounded like wind already. This method proved better than simply going outside and recording the wind because the busyness of Worcester meant that there was no real quiet time to to get just the wind.

In B-term, I created the assets for the anxiety room while also continuing creating sounds for the level as a whole and rigging the monster that was so beautifully created by Logan. For the anxiety room, I modeled it after a bedroom in my friend's house, with the wooden floors and the long room. The crack in the floor only extends the room further than it would normally be extended. The furniture and wall designs are based off of both my apartment in Worcester and off of modern design ideas off the internet. The room was created in Maya. Throughout the term minor changes were needed on the room to accommodate it to the look and layout of our game. The rig proved to be the challenge of the term for me as it was the first time that I was using that kind of rig. For this model I used the CAT rig on 3ds Max on the advice of my advisor. This rig proved to be somewhat easier than it is to make a rig in Maya, however my unfamiliarity with the program and the rigging set up meant that I needed time to create it well. Still, the rig ended up being successful and allowed for the monster to be normally functioning. The character's movements and bone structure are based on those of a cat because of the four bone structure in his leg.

This led to C-term being full of animation. All of the character, camera, and object animations were done by me in C-term. These animation were done in either 3ds Max, where the character animations were done, or Maya where the other animations were done. The character animations were based on both the movements of people for the upper body and on the movements of cats for the lower body. We originally planned to do only a couple of animations for the game, but we decided to add more animations as the term went on. Some of these animations had some issues thanks to my lack of knowledge with the rig, but with time and practice the rig and animations all turned out fine. Also, we finished off the last of the sounds that we needed for the game.

Conclusion:

In conclusion, we believe our MQP satisfied our expectations. We are very happy with the outcome and we are very proud of our work. We will be happy if our game helps at least one person to understand the struggles of a mental illness and how hard it is to overcome them. We plan to enter this game in game competitions and showcase it at PAX East in April 2014.

We would also like to keep working on this game, making it better, adding more rooms and mental illnesses, and creating even more content.

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