

Exploration of Video Games as a Method of Producing Accurate Ethical Decisions



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Abstract

This project adopts the theme of combining both gameplay experience and moral and ethical issues. Participants will play a game set in a hospital making decisions on ethical dilemmas. There are five ethical dilemmas in total. The game provides a story around the doctor the participants play as. The participants can only answer two ways and they must select one. After each dilemma they are asked to justify their decision. The decisions they take are recorded for analysis. Results show that the participants for the most part answered the dilemmas in line with expectations. The answers ranged from a 70% - 100% expectation to result rate. When participants were asked if they would answer the same way as they would in real-life, 70% answered 'yes' with the remainder stating 'no'. Results indicate that video games have a degree of effectiveness to provide accurate answers the ethical dilemmas.

Table of Contents

Introduction	1
1.1 Background.....	1
1.2 Video Games	1
1.3 Ethics	2
1.4 Aim & Objectives	2
1.4.1 Aim	2
1.4.2 Objectives.....	3
1.5 Referencing.....	3
Background and Literature Review	4
2.1 Background.....	4
2.2 Ethical Study.....	4
2.2.1 Background.....	4
2.2.2 Modern Day Ethics	5
2.2.3 Real Life Ethical Dilemmas	6
2.2.4 Ethical Examples in Video Games	7
2.4 Related Literature.....	7
2.4.1 Doctrine of the Double Effect	8
2.4.2 Video Games	8
Methodology.....	11
3.1 Project Management	11
3.1.1 Scope of Management.....	11
3.1.2 Research.....	12
3.1.3 Time Management.....	13
3.1.4 Weekly Strategy	13
3.1.5 Other Factors	14

3.2	Software Development.....	14
3.3	Toolsets and Machine Environments.....	15
3.3.1	IDE	15
3.3.2	Programming Language	16
3.3.3	Communication Tools	16
3.3.4	Windows Forms App	16
3.4	Research Methods.....	16
	Design, Development and Evaluation	18
4.1	Developing the Game	18
4.1.1	Background	18
4.1.2	Design.....	18
4.1.3	Ethical Scenarios	21
4.1.4	Testing.....	25
4.1.5	Operation	26
4.2	Evaluation.....	26
4.2.1	Summary.....	26
4.2.2	Methods.....	27
4.2.3	Results.....	28
4.2.4	Discussion	32
	Conclusions	38
	Reflective Analysis.....	42
	References	43
	Appendix.....	45
	Game Design Document.....	45

List of Tables

3.1.1 Table to show Waterfall Methodology	11-12
4.2.3 Table to Show Distribution of Ethical Decisions	28-29

Chapter 1

Introduction

1.1 Background

This project will be exploring the ethical decisions people make in a high-stake environment. One of the core concepts of this work is to make the experience relatable to the user to illicit more genuine responses to the ethical dilemmas. This is explored through a video game so the participants will have introspective experience through the journey. Morality in video games is nothing new (Shafer, D. M. 2012). The combination of video games and the study of ethics could be a viable method of future study. This study will explore this.

1.2 Video Games

According to Statista website the expected value of the video game industry is measured to surpass 138 billion by 2021, up from 52.8 billion in 2012. In addition to this, the website also states that there were up to 2 billion gamers in 2015, expecting the total number to reach 3 billion by 2023. Gamers are very passionate about the games they play, especially when it comes to aspects related to story. For instance, Glennon writes about the Last of Us 2 story leak that resulted in negative reactions from fans and journalists. Due to the story leak, fans posted their dismay and spoilers for the game on social media (Inverse, 2020). Due to the passion and popularity with video games as a hobby and lifestyle, using it as a method of research is a dependable idea. With a story aspect, people will be easily motivated to play the game.

Decision making in video games is relatively common, however some video games have a two-way decision that alters the trajectory of the story. These decisions can come in the form of a moral dilemma. For instance, Spec Ops: The Line deals with

this on multiple occasions. One example is where the player must interrogate a soldier for vital information or save two civilians from being executed. Another game example is Paper's Please. This is where the player assumes the role of an immigration officer and must use attention to detail on the various documents the immigrants show to the player to permit themselves into the country. The ethical decisions come in the form of choosing to reject those who need help but do not have the required documents or letting them through and risk a terrorist attack. This project delves into this and observes the relationship players have with such scenarios; how they philosophise the conclusions they make.

1.3 Ethics

The morality of video games is something that has been discussed before. In the case of morality, people choose to perform good actions or bad actions, however in the case of ethics people try to figure out the most positive thing to do in a situation. Video games have events that force the player to do moral or immoral things, but there are also situations where players are given the choice. Will players choose the option that is most fun, or will they pick the option that they think is the right thing to do? Are their decisions impacted based on how much emotional attachment they feel to the characters? Will they go through these scenarios like they would in real life? There are several scenarios that could produce different results based on the person. This project will discuss this and find out the answers to these questions. It will also aim to find out how people apply this to a context set in a video game.

1.4 Aim & Objectives

1.4.1 Aim

To explore if people answer ethical quandaries in an ethics specific video game the same way as they would in real life. Can a video game make people act in a certain way? Do people become more or less ethical in video games?

1.4.2 Objectives

1. Build a literature review on two subjects. The first is on ethics and the other is video games. The literature review on ethics will explore ethical quandaries and thinking methods, whereas the video game literature will explore the behaviour and thought process that occurs when playing video games.
2. Build a video game that has a story that creates an interpersonal relationship with the user complete with ethical dilemmas.
3. To collate data from the answers participants provide for analytical study.
4. To conclude, based on the data whether a video game can be used as an important gauge to produce accurate ethical decisions.

1.5 Referencing

The referencing standard for this report is Harvard. The references are located at the bottom of this paper.

Chapter 2

Background and Literature Review

2.1 Background

This section will detail various literature and research that relates to the project theme. This will include ethics and video games.

2.2 Ethical Study

2.2.1 Background

According to Velasquez et al, ethics is “based on well-founded standards of right and wrong that prescribe what humans ought to do, usually in terms of rights, obligations, benefits to society, fairness, or specific virtues”. Most often, philosophical ethics is thought to have started with Socrates. The example of Socrates in the writings of Plato helped assist in the establishment of moral philosophy as a standing subject (Charlotte B.Becker, 2003, p1). For much of ancient Greece the moral code to live by was presented by virtuous men. Writers such as Homer emphasised this in his work. For instance, in *Odyssey* the heroes would look up to the Gods as a resource for the right way to live (Jennifer Downs, 2012, p1). This therefore created a hierarchy of a moral structure with the people at the bottom inspired by the heroes in the centre who were inspired by the Gods at the top. Downs argues that since the fall of Ancient Greece, an opposing stance is taken on morality by philosophers who make the case that morality and ethics are relative features of the individual and there is no pre-set code to apply to all people.

2.2.2 Modern Day Ethics

Modern philosophers typically divide ethical theories into three general subject areas which are metaethics, normative ethics and applied ethics (Internet Encyclopaedia of Philosophy, n.d). As described in, Introduction to Professional Ethics, metaethics studies where ethical principles come from and the meaning of ethical concepts. Normative ethics concerns how an individual may determine a moral course of action. Applied ethics looks at what someone is permitted to do in a particular domain (Dr Chris Headleand 2019.)

One normative theory in particular is consequentialism. Gensler (2017, p.174) states in his book: Ethics: A Contemporary Introduction, that consequentialism teaches one basic duty: “To maximise long-term good consequences.” Utilitarianism is a popular form of consequentialism. The classical form of it is described by Gensler (p.176) as “we ought always to do whatever maximises the long-term balance of pleasure over pain for everyone affected by our action.” Ultimately, individuals should maximise the long-term utility of all affected parties. Through the logic of utilitarianism things such as racial inequality would be unjust, however it could also favour theft from the wealthy to help the poor. This is because it minimises pain by only taking little money from the rich and maximises happiness to the poor. If a millionaire lost £10,000 but was distributed evenly across five families, then it could be considered justified under utilitarianism.

Conversely, there is also non-consequentialism (deontology), another normative theory. Ethics Unwrapped (2021) defines deontology as an ethical theory that suggests that ethical actions follow universal moral laws that distinguish between right and wrong. Unlike consequentialism, deontology does not need to analyse the costs and benefits of a situation, thus making it far simpler to follow. The philosopher Immanuel Kant criticised consequentialism believing it was problematic due to it ignoring morals and principles (Dr Headleand). These moral principles can be universally applied since they contain moral laws such

as do not cheat or steal. The logic of this theory breaks down when considering that sometimes a moral law (such as lying) needs to be broken to prevent a negative outcome. For instance, some people would lie to SS officers about where Jewish people were located during the Holocaust. Being honest in this case would be seen as morally reprehensible (Hart, 2019). A consequentialist would see lying as a good action to take in this case.

Virtue Ethics takes more of a concern on the individual rather than the actions taken. It takes a stronger look at how the person has lived their life rather than particular events or actions (Dr Headleand). A virtue is an attitude or character trait that allow people to be and act in ways that develop this potential. A virtue will enable people to pursue the ideals they have adopted. Examples include generosity, integrity, courage, self-control, and honesty (Velasquez et al., 1988). One criticism of virtue ethics is that it does not provide a clear way of thinking through moral dilemmas. Also, virtues can be morally relative. Meaning what is virtuous in one culture could be completely different in another (BBC, Virtue Ethics, 2014). Therefore, virtue ethics cannot be universally applied, thus diminishing its application to moral theory and guidance.

2.2.3 Real Life Ethical Dilemmas

Recent moral dilemmas have come into the modern world. One example is should self-driving cars swerve to kill the driver or continue to kill pedestrians. Iyad Rahwan explains this in a TED talk where he and his team created a survey. The survey gave two options based on two philosophies. The first is Jeremy Bentham's utilitarian approach and the second is Immanuel Kant's deontology view. The utilitarian view suggests that the car should minimise total harm and swerve away from the pedestrians to kill the driver. On the other hand, the deontological view suggests that the car should follow duty-bound principles and not deliberately kill a person, therefore continuing its course and potentially killing more people. Most people opted for the utilitarian point of view, however participants also stated that they would not buy a self-driving car unless it

protects them at all costs. This could be a sense of selfishness taking over the ethical logic. The Moral Machine website has brought attention to this issue by asking participants to choose between two driverless car crash scenarios. A range of factors are at stake including passengers in the car, the age of the victims, the gender of the victims, the species, and if the pedestrians are jaywalking or not. The participant plays through thirteen scenarios. The point of the study is to reach greater understanding of people's judgements about challenging moral dilemmas that involve inevitable death (Moral Machine, n.d.).

2.2.4 Ethical Examples in Video Games

Similar moral dilemmas have been presented in video games. For instance, in 'Spec Ops: The Line' the player is presented with the choice of killing between two men. The first is a civilian who stole water (a capital offence), the other is the soldier ordered to arrest the thief who instead killed the thief's family (Robbins, 2020). This example seems more like a deontological dilemma with the player choosing who the most deserving to live based on their actions. Robbins gives another example is the choice in the game: 'Life is Strange'. This is where the player must choose between saving the good people of Arcadia Bay from peril or saving your best friend. This example appears to have a more consequentialist scenario. This is because the scenario has a clear utilitarian look: "The needs of the many outweigh the needs of the few", the many being Arcadia Bay and the few being the player's friend.

2.4 Related Literature

Although the concept for this project is original, Tom Smith's Thesis has been an influence on imagining one of the ethical scenarios. His work details the "Trolley Problem" scenario.

2.4.1 Doctrine of the Double Effect

Alison McIntyre explains in the Stanford Encyclopaedia of Philosophy (2004), that the doctrine of double effect is frequently invoked to explain the permissibility of an action that causes a serious harm. An example of such would be the death of a human being, as a side effect of promoting some good end.

A frequent example of the Doctrine of Double Effect is the trolley problem. Phillipa Foot's 1967 paper titled: "The Problem of Abortion and the Doctrine of the Double Effect" observes the philosophical issues surrounding the Doctrine of the Double Effect. Foot creates a hypothetical where a patient requires large dose of a drug that is in short supply. There is one patient he needs the entire supply and five other patients who require the same drug but in small doses. Therefore, the Doctrine will state that saving five patients while losing one is the ethical choice to make. The New Catholic Encyclopedia p.1021. explains this as the following: "The good effect must be sufficiently desirable to compensate for the allowing of the bad effect".

Foot creates another hypothetical. In this case a fat man is blocking the exit of a cave and has trapped the rest of the party of potholders behind him. During this time, the floodwaters in the cave rise and the trapped party have two options. The first is to use dynamite to blast the fat man out of the cave, which will kill him but save the rest of the party. The second option is the party drowns except the fat man who will be rescued to safety in due course. Justification for this killing the man would involve killing the one to save the many, in other words more lives are saved. Ultimately, justifying the death of a person is not an easy task, but under pressure people must make quick decisions on ethical dilemmas. If they do not it could result in everyone dying instead of fewer.

2.4.2 Video Games

Garry Young and Monica Whitty wrote about the psychological approach to moral well-being in the book entitled Psychology of Morality. Moral actions will

be taken through the game as a part of this dissertation. Concluding several studies, they state that: “Others have argued that repeated exposure makes individuals less physiologically responsive to the pain and suffering experienced by victims of violence” (Carnagey et al., 2007; Funk, Bechtoldt-Baldacci, Pasold and Baumgartner, 2004). After 20 minutes of playing a violent video game, participants were more physiologically desensitised when compared with the group who played non-violent video games (Carnagey, 2007). If this is true, then this could impact the participants decision making in the project. The selection of answers and justifications for decisions could be influenced by this depending on the violence of the video games the participants play. As a result, this could create useful data to compare in the project.

Tracy Fullerton (2018) discusses drama in video games and how stronger game design can “elicit powerful emotional reactions from players.” Fullerton asks two questions. The first is “How does the gameplay cause the dramatic tension to rise?” and the second is “What deciding factor in the gameplay brings the game to a climax?”. Violence can emphasise drama which emphasises story. This highlights how crucial adding tension and drama is to a game.

Zagal (2009) wrote in his paper: ‘Ethically Notable Videogames: Moral Dilemmas and Gameplay’ about what ways can moral decisions in video games be used to make players reflect on ethical issues. Zagal presents a perspective which mentions that modern videogames are not mindless button mashing but rather have rich and engaging storylines. In practice the narrative and rules that make up the game build an ideological framework. This is because in video games, certain behaviours and action are encouraged and discouraged. Typically, encouraged behaviours can be seen as good things to do in game. Kirsten Pohl (2008) makes the argument that emotional involvement characterises video games. Pohl states that there are two kinds of emotional involvement: the instantaneous (the desire to win) and the spontaneous (the desire to play because of identification and relation to story). A strong in-game narrative makes player’s care about the character and his/her story, thus wanting to continue the game to

see its conclusion of the character. She also points out a distinction between a character's dilemma and a player's dilemma. The former being an in-game decision the character answers and the latter being a dilemma the player answers. Pohl claims that by definition, a character's dilemma would not be as effective as a player's dilemma when trying to make players reflect on ethical issues.

Chapter 3

Methodology

The following section will detail the management of the overall project. It will detail the software development; the strategy employed to build the project and focus on the processes of every section. Furthermore, each method will have its own justification for being enacted.

This project was born out of the idea of combining ethics research with IT. This idea needed to be fleshed out and developed. This was done through brainstorming ideas and doing background research. Once the idea came into fruition, an appropriate strategy needed to be built to oversee the project.

3.1 Project Management

3.1.1 Scope of Management

Overall, the project needed a well thought out structure behind it to get the work done and meet the deadline. An effective strategy was needed in place to track progress and set goals. The methodology chosen for this project was waterfall. Waterfall provides a structured linear sequential life cycle to follow through the project. Each stage is done in sequential order where the next stage cannot be done unless the previous step is completed (Guru99, 2021). Brief summaries of each stage are below.

Stage	Description
Requirements	This stage identifies all the requirements needed to build a game

	that obtains the required data from participants.
Design	This stage involves heavy brainstorming and drawing up of ideas. To find the best solution, multiple ideas were created, where the best one would be selected as the final solution.
Implementation	This involved building the interactive game using the design stage as a template of inspiration.
Verification	This stage was a testing phase. This involved both black box and white box testing. Black box testing is where the internal structure and code is unknown to the player. This was achieved via test participants. The white box testing was done by breakpoints in the code and consistent testing.
Maintenance	After the participants have played through the game and answered the questions, an analysis of the data and reflection of the project is taken. The traditional role of this stage is inappropriate in the context of this project since it is more based on qualitative research rather than software development.

Table 1 – Table to show Waterfall Methodology

3.1.2 Research

This project needed to be managed in several ways. The first was research. The key part to the success of this project was adequate planning to set in stone the

foundation of what to build. From the aim of the project, relevant academic literature could be studied to help conceptualise past and current research that can be identified with the main project aim. This was achieved via reading through various research papers and studies. A specific amount of time and a target goal of papers to read was set. The method used to find the right research was to select what seemed the most interesting and relevant to the goal.

3.1.3 Time Management

The second part of the project plan was time management. This could be built to schedule the length of time required for the required activities. This was the foundation of a visual form of time management. A vital part of time management, the Gantt chart provided a clear perspective on how many tasks there were and how long they took to complete. Overall, this method provided a strong guideline to follow for the duration of the project, else time constraints would close in and lead to a less successful end.

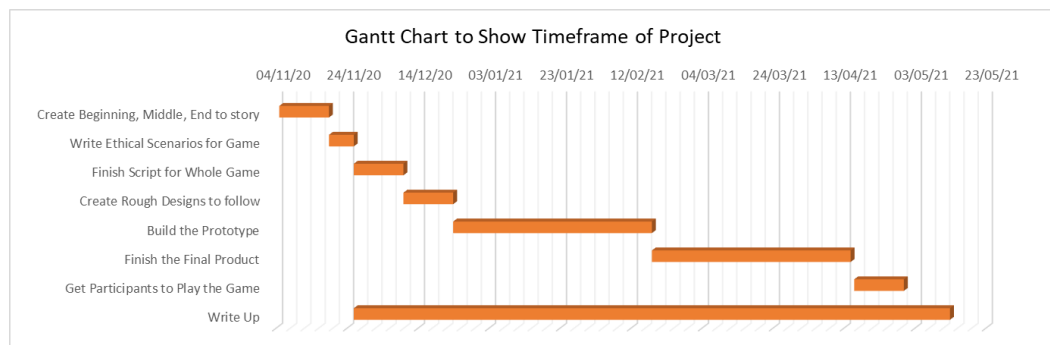


Figure 1 Shows Timescales and Milestones for the Project Objectives

3.1.4 Weekly Strategy

The two main factors that drove the management of this project were the development of project work every several days combined with weekly meetings to discuss current work and what to further progress with. This was an effective

strategy to stay on top of work whilst keeping up with the timeline. By keeping up with development of the dissertation, ideas and designs were kept fresh in mind and could be easily expanded upon and developed. In addition to this, it created weekly goals to work towards, thus building and keeping momentum going to complete the project on time.

3.1.5 Other Factors

Management of potential risks was another important factor. By acknowledging potential risks to the completion of the project, methods and strategies could be constructed to mitigate them. Since the Covid19 pandemic had restricted personal meet ups due to lockdowns, a strategy had to be in place to deal with this. This involved using online resources to allow people to play through the game online. Additional management to this included building the game in such a way that the answer they would provide would be automatically saved on the program, thus preventing the need to watch the person make the answers.

3.2 Software Development

For clarification, this project is research based and its primary goal is not the development of software. Therefore, this section will be brief whilst the primary research will be more detailed. Nonetheless, a development of a game did occur and had a strategy in place to construct it (Project Manager, n.d.).

Based on the strategy for each point above, the expected software development lifecycle employed to this project is the Waterfall model, however the Agile methodology would be a more accurate way to describe the software development process. This is because the Waterfall model should have worked in theory but in practice an Agile approach was taken. Due to the work being an individual project, certain principles of Agile could not be reflected. Such examples include “individuals and interactions over processes and tools” and “customer collaboration over contract negotiation”. Instead the one Agile approach that did

occur was the “responding to change over following a plan” (Wrike, n.d.). The reason for this is that certain changes were made during the building phase of the game. For instance, there were changes to the game story when confronted with sub-optimal scenarios. Also, testing was done frequently throughout the duration of the building phase. This was done to ensure there was a strong foundation of functional software to augment the rest of the program.

Two housemates came in as testers for the prototype. They played through the game and provided their feedback on their experience of the game. Feedback included bugs, critique on dialogue and functionality.

3.3 Toolsets and Machine Environments

During the design phase an account of required software, hardware and resources was taken into account. What was mandatory and what was a consideration needed to be addressed. The key factors to acknowledge were what software was the game going to be built in, what hardware limitations there might be and what communication tools are needed.

3.3.1 IDE

The Integrated Development Environment used to build the prototype and final game was Visual Studio 2019. From a management standpoint, this was the most optimal IDE to use based on several factors. The first factor was availability. The University labs have Visual Studio installed on each machine by default. By having this, it provides a backup plan to continue building the game in University should any technical issues occur. Moreover, since Visual Studio is such an abundant IDE, other IT students will likely be familiar with it as well. This contributes to the second factor which familiarity. Due to the final game requiring participants to play, having players understand the basic functionality of the software creates an ease of use and saves any additional time to explain to players how to use it. Ultimately, this was an appeal to other people with their familiarity with the software. The third factor

was popularity. Since Visual Studio is the most popular IDE searched on Google (Top IDE index, 2021), there would be an abundance of online information to learn and research from to understand and use the IDE. This resolves the risk of running into a problem when building the game and not having the research materials to assist. Overall, Visual Studio 2019 was objectively the best IDE to use.

3.3.2 Programming Language

The game was built in Visual Studio 2019 with C# language.

3.3.3 Communication Tools

During the Covid19 pandemic communication tools were vital to the success of this project. Due to lockdowns and social distancing, communication between module coordinator and project supervisor needed to be done online. Both University email and Microsoft Teams were used for communication between everyone. From a management point of view, time needed to be allocated to allow effective use of online lectures and online meetings. This involved ensuring that weekly tasks were completed, and queries were written down prior to the online meetings. To keep online communication as effective as possible, outlook was kept open as long as possible in case of an urgent email to read or respond to. An additional communication tool that was used was Discord. This was an effective tool to reach out to people to participant in the game playthrough. Covid19 restrictions made this tool vital to obtain additional participants since home participation was limited to housemates.

3.3.4 Windows Forms App

3.4 Research Methods

Research approach, record answers, qualitative study, covid19 made it this way, both face to face and online. Reference research methods, interaction design

To answer the title to this study, a video game had to be made around ethical scenarios. The research method for this project involve the use of players filling out questionnaires whilst playing the game. The questionnaire is not the traditional kind with a scale of 1-10 to select but rather a set of open questions. The open questions are intended for qualitative detail. Qualitative data is a method to approach data analysis via the form of descriptions and quotes from participants (Helen Sharp et al, 2019). According to Susan Farrell (2016) if participants talk in depth about a question, valid information can be derived from fewer users, “Not statistical insights, but qualitative insights.”.

Answers by participants were recorded in game and saved onto separate text files. Study was conducted with participants at home and online. Interaction with the game was done via a simple button layout, text as dialogue and textboxes to type their answers in. It was important to have strong Human Computer Interaction (HCI) in the game especially conceptualising it before building it. According to M. Hanefi Calp and M. Ali Akcayol (2019),

“it is observed that when the design methods used in the scope of human-computer interaction are integrated into software development process during the life cycle, the developed projects are more successful, have better quality and are more user friendly.”

Due to this it was vital to ensure the game was as user-friendly as possible to make the experience as easy as possible. To obtain accurate answers, the participants needed an easy environment to navigate without aid. If the environment took too long to navigate it may have led players into a state of impatience, thus answering questions dishonestly.

Chapter 4

Design, Development and Evaluation

4.1 Developing the Game

4.1.1 Background

To build an appropriate game environment where participants will need to make several ethical decisions, a setting had to be thought out. This was thought out as a doctor in a hospital taking care of a variety of patients. Events will occur in game and ethical dilemmas form. The player must choose one of the options in game and justify their decision. Ethical dilemmas in game would be reimagined hypotheticals such as the trolley problem. A game design document was built (located in appendix) to help flesh out the design and build of the game; moreover, a script was written for the dialogue in game.

4.1.2 Design

There were a few video games used for inspiration in this project. The first was Paper's Please where the player assumes the role of an immigration officer. The ethical decisions come in the form of choosing to reject those who need help but do not have the required documents or letting them through and risk a terrorist attack. The ethics at play in the game were an influence on how certain decisions in the game can lead to negative consequences. Additional influence from the game was a day to day timeline, however it was expressed in weeks in the final game.



Figure 2 Image of Terrorist Attack from *Papers, Please* (*Papers, Please Wiki, n.d.*)

The next one is: *Phoenix Wright: Ace Attorney Trilogy*. This was used as inspiration for the look of a still image in the background with text upfront.

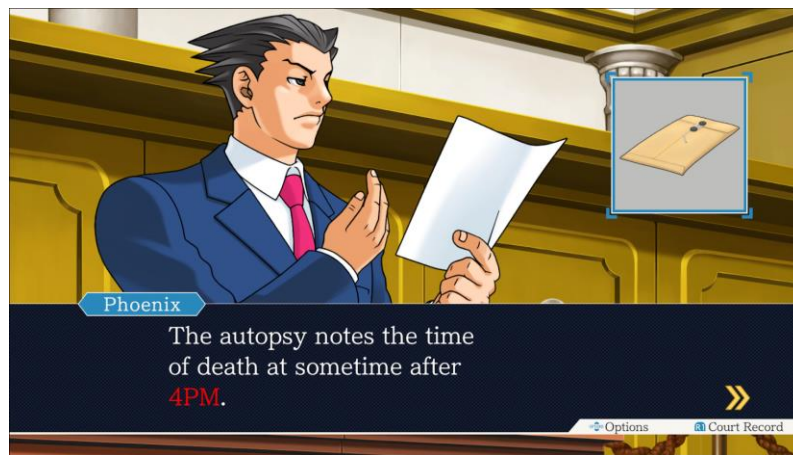


Figure 3 Image of Game Scene from *Phoenix Wright: Ace Attorney Trilogy* (*DigitallyDownloaded.net, n.d.*)

The game combined both of these into its design and then afterward a level design needed to be constructed. Participants would play as a male doctor with a family consisting of a daughter and a wife. The story would take them through hospital shifts that occur weekly where each day consists of multiple scenes. Within these scenes there would be people the player can choose to speak to for additional dialogue. This acts as extra background information about the character and his relationships. As stated in the literature section:

“A strong in-game narrative makes player’s care about the character and his/her story, thus wanting to continue the game to see its conclusion of the character.”

Ultimately, the purpose of added dialogue would bring additional relation, care, and story for the character, thus leading to perhaps more accurate ethical decisions.

Each day will have an ethical dilemma that the player will have to face. They must pick one out of two options, similar to the trolley problem. After the event they must justify their rationale for the decision they just made. In addition to this the player does not know about the consequences of their actions until after the event is over. These consequences influence the environment around the player as well as the character they play as in game. At the end of the game the player will need to answer five more questions related to the research question. Also, they will need to answer three questions as part of a game review. All answers the participant make are saved in text files in the game directory. These results are subsequently copied over to a spreadsheet to collate them with other answers.

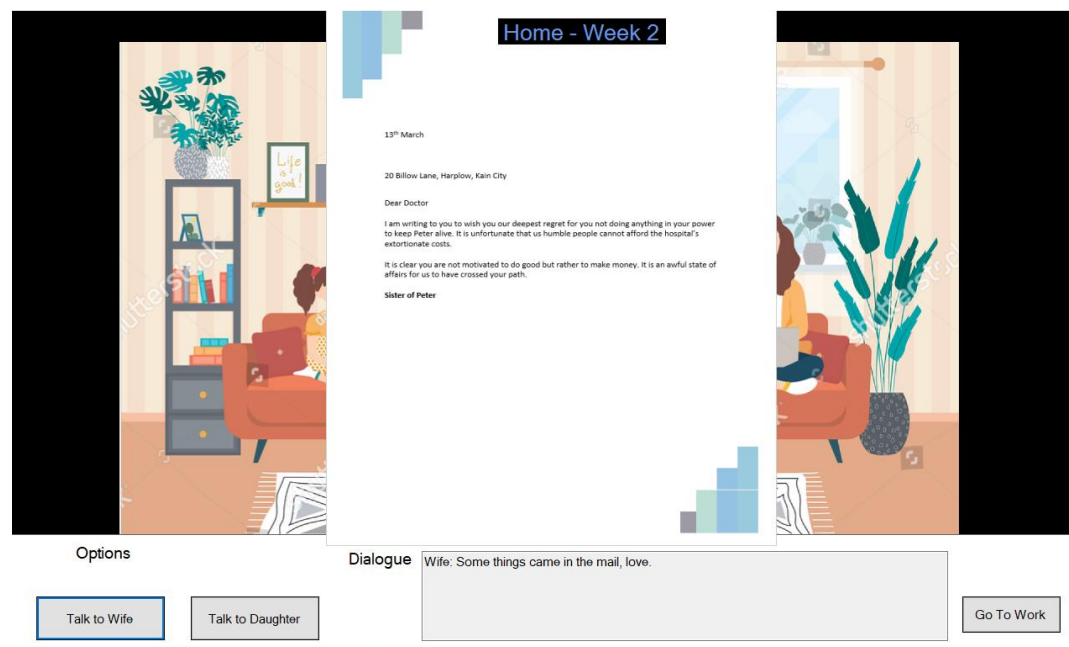


Figure 4 Living Room Scene from 'Doctor What Would You Do?' - Letter of Regret

4.1.3 Ethical Scenarios

There was a total of five ethical scenarios in the final game. These scenarios are inspired from a variety of ethical quandaries and moral philosophies. Three answers have an expected result whereas two of the dilemmas have a more indifferent outlook. Each participant will choose one option and justify it accordingly.

Scenario 1

This scenario deals with a patient stuck in a coma. There is a brother and sister of the patient the player can speak to. They cannot afford to keep up with medical bills keeping him alive and ask for your help, else the patient (Peter) will die. The player is then faced with the first dilemma which is the following: Pay for their hospital bills or pay nothing. This scenario expectedly tests the player's look on charity vs principle. Will the player be charitable or refuse out of principle since no other patient obtain the same charitable luxury? There is no expected way the player will vote on this scenario and as such the results will show what the majority opinion is.

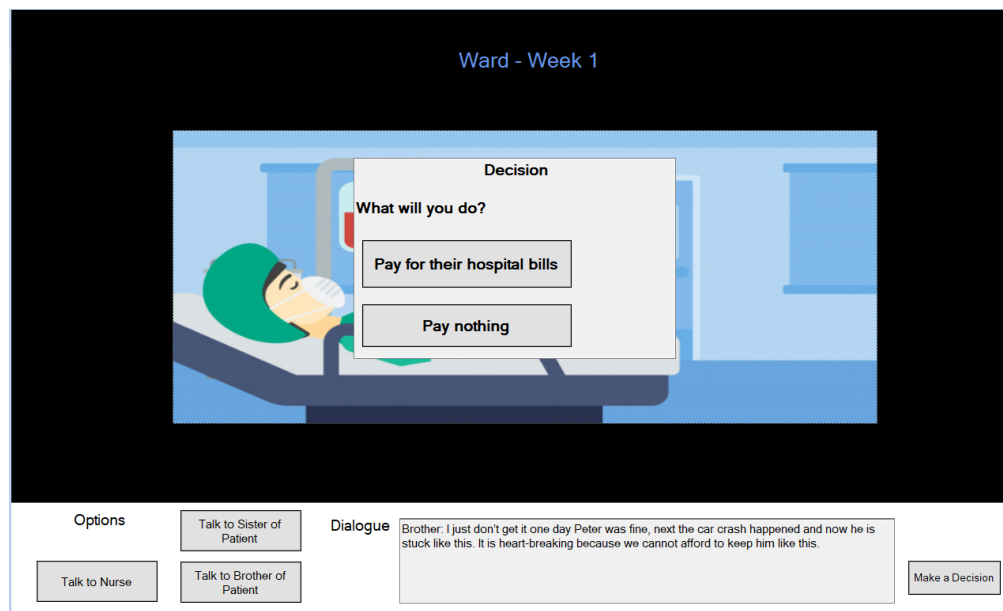


Figure 5 Scenario 1 scene from "Doctor What Would You Do?" - Patient in Coma

Scenario 2

Inspired from the trolley problem, the ‘medicine problem’ is analogous to the scenario described by Phillipa Foot in the literature review. This is the case where six patients require medicine however there is not enough to distribute to all patient to save them. Five patients can share a dose that saves them whereas the one patient left over needs the entire dose. Patients who do not get the medicine will die. To alter this into a more balanced scenario the age of the patients was changed. The five patient who can share the dose are adults whereas the one patient who needs the entire dose is now a child. In other words, save five adults or save one child. Since people tend to have a tendency to save children over adults this would balance the scale and have more diverse results. Like the previous scenario there is no expectation on where people will answer.

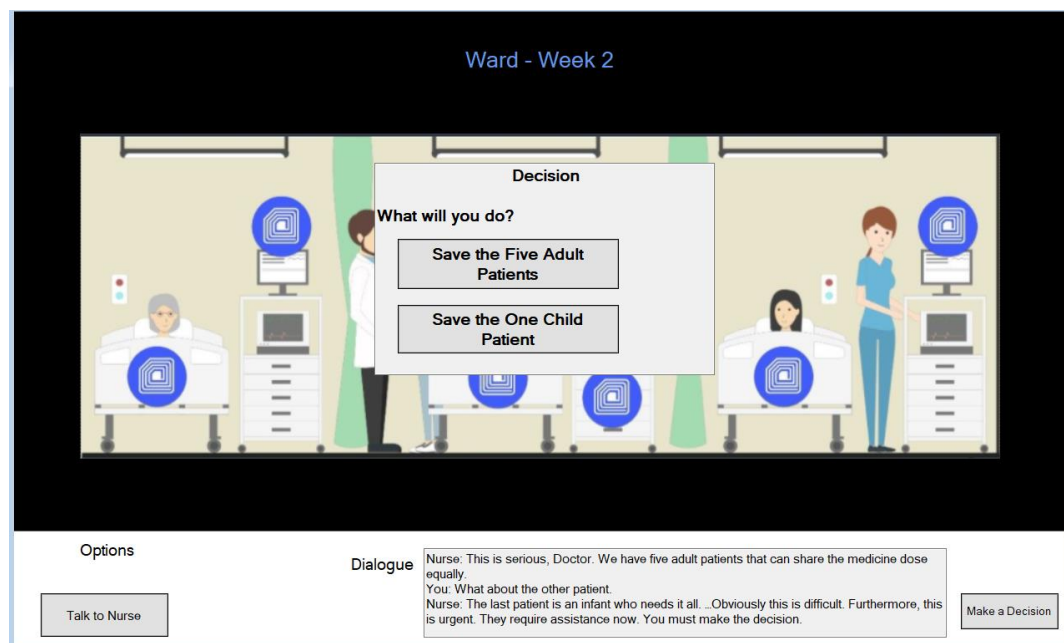


Figure 6 Scenario 2 scene from "Doctor What Would You Do?" - 5 vs 1

Scenario 3

Inspired from Tom Smith's male vs female scenario (2019), scenario 3 takes an even scenario and adds additional weight to one side like the previous scenario. In Tom Smith's thesis he proposed a trolley scenario to participants that involved

switching the tracks to save a man or switch the tracks to save a woman. Results show that “both male and female participants displayed a significant preference for saving the female in V2” (male vs female). This shows that participants prefer saving an unknown female over an unknown male. To alter this scenario 3 took the same concept but made the unknown male as a friend the player has in game. The expectant result of this would be that the majority would rather save a friend over a stranger with no consideration to the gender of the patients. The scenario drawn out in game involves both people needing immediate attention, but the player can only save one. Will the player save their friend or an unknown woman?

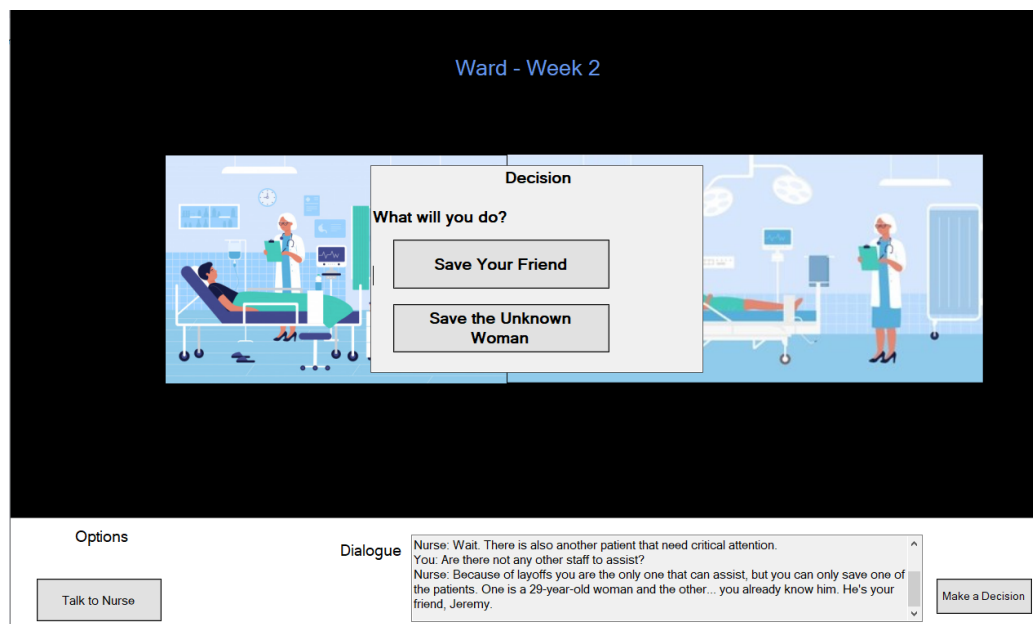


Figure 7 Scenario 3 scene from "Doctor What Would You Do?" - Friend or Female?

Scenario 4

This is the darkest scenario of the game seeing as it deals with murder through deliberate sabotage of a patient's safety. In this event the player has received a letter from the mortgage lender stating that he has not kept up with payments and his family faces eviction from their home. The mortgage lender is in hospital the next day in the operating theatre and needs immediate attention. The player has a choice to make. They must either save him like they would any other patient or botch the operation, thus killing him but potentially saving the player's family from eviction.

This scenario deals with a consequentialist vs deontological dilemma. If the needs of the many outweigh the needs of the few a Utilitarian may choose to botch the operation to save themselves and their family at the expense of one life. On the other hand, a deontologist would stand on principle that murder is always wrong. The results from this would indicate which moral philosophy they most likely align with. With that in mind, the expectation is that most would save the mortgage lender due to a series of factors such as repercussions, the law, and no guarantee the eviction would be cancelled.

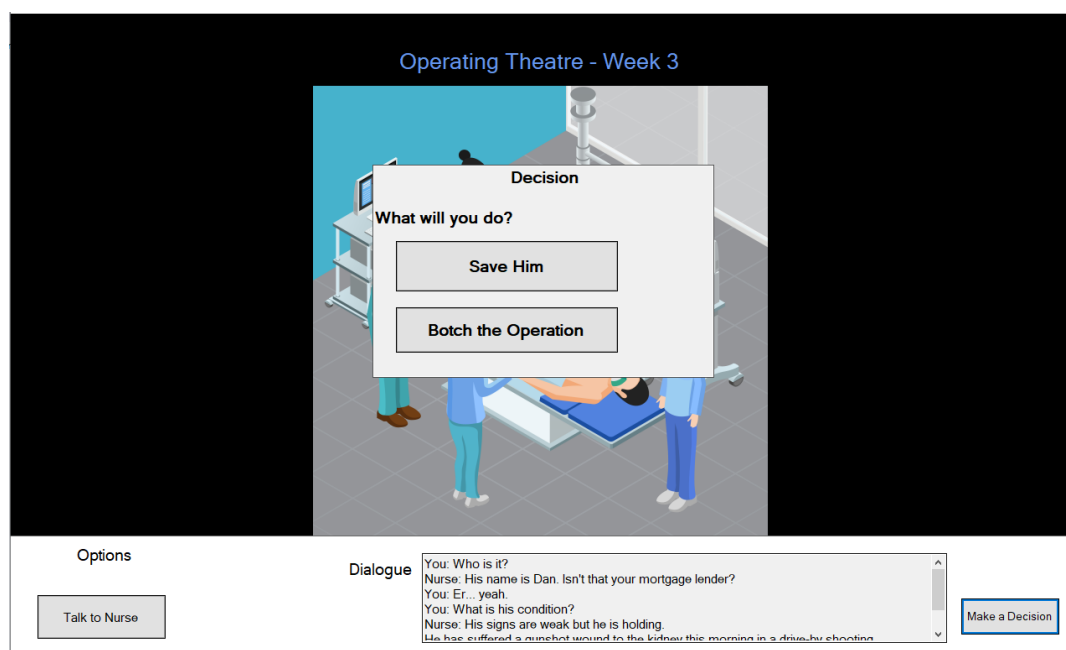


Figure 8 Scenario 4 scene from "Doctor What Would You Do?" - Kill Your Enemy?

Scenario 5

This last scenario is simple but still heavy as it deals with self-sacrifice. There is a child patient who requires an immediate heart transplant but there are no donors. The player has a final choice to either sacrifice themselves and donate their own heart to the child or declare they can do nothing. The expectation of this scenario is that no one would sacrifice themselves for a patient, even if the patient was a child. This is because there are only a few scenarios where people would sacrifice

themselves for another. Examples would include saving family or in battle. Since this scenario does not deal with either the results of this event will be consistent.

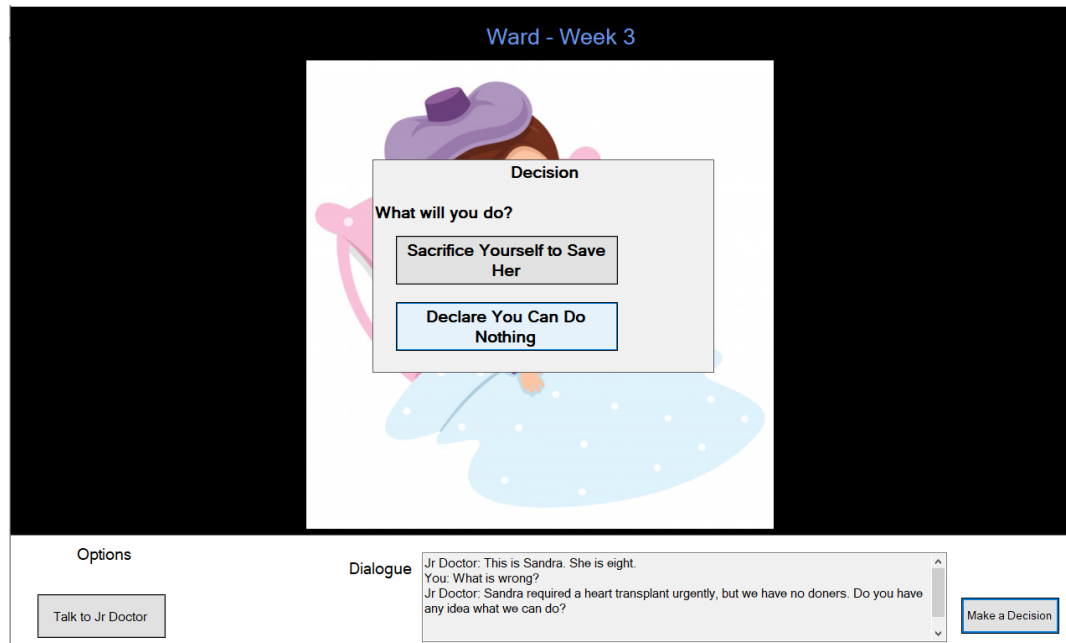


Figure 9 Scenario 5 scene from "Doctor What Would You Do?" - Sacrifice Yourself?

4.1.4 Testing

There were two phases with testing. The first was the testing during the build phase and the second was the prototype testing.

Build Phase Testing

During the building of the game each scene needed to be tested after completion to ensure the scenes functionality worked. Frequent use of debugging was used to achieve this along with breakpoints in the code. Testing was a frequent practice throughout the building of the game and at the end of the build to ensure everything worked together.

Prototype Testing

Prototype testing was done via external testers. This means that a housemate was brought in to play through the prototype and give feedback on it. Such feedback involved fixing grammar errors, graphics, and functionality.

4.1.5 Operation

This is the maintenance phase of the cycle. Since this is not a product for public consumption this is a limited step. After participants have completed the study, they will not play the game again. However, there is a general feedback section at the end of the game stating what could be improved upon. The answers the participants give can act as a framework or guideline to any future studies in the field that wish to use the same methods.

4.2 Evaluation

4.2.1 Summary

Participants were recruited via contacting housemates and contacting people online through Discord. The participants were both from the University and outside of the University. To keep in line with ethical procedures, participants were required to read an information sheet and sign a consent form prior to playing through the game.


Participant Identification Number for this study: 05

CONSENT TO PARTICIPATE IN RESEARCH

Title of Project: Exploration of Video Games as a Method of Producing Accurate Ethical Decisions / Dissertation

Name of Researcher: Dylan Wallace

Name of Participant:



Highlight box by double clicking on it and then selecting a highlight colour on the format shape tab

1. I confirm that I have read the information sheet dated 03/05/21 (version 1) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my legal rights being affected. ☐
3. I understand that should I withdraw then the information I have given us up to this point will be deleted/destroyed. However, once the anonymised data set has been created it will not be possible to remove my anonymised data from the analysis. ☐
4. I understand that individuals from the University of Lincoln may look at research data collected during the study, to ensure that the study is conducted appropriately. I give permission for these individuals to have access to my records; I understand that my personal details shall be kept confidential. ☐
5. I understand that the information collected about me will be used to support other research in the future and may be shared anonymously with other researchers. ☐
6. I would like to receive a summary of the results of the study ☐
7. I agree to take part in the above study. ☐

_____ 03/05/21

Name of Participant Date

Dylan Wallace _____ 03/05/21

Name of Person taking consent Date

Figure 10 Consent Form for Participants

4.2.2 Methods

Study was conducted through questionnaires that occur through the game. After each dilemma a question was asked to the participant asking them to justify their decision. After the game as completed, the participant was asked eight more questions. They were as follows:

1. Did you feel like you were playing yourself in a game or a character? – Did you relate to the character in any way?
2. Did you see this as an insightful experience or just a simple game to play?

3. Do you think you would have taken the same decisions in real life?
4. Do you regret any of the decisions you took? Which decision did you regret and why?
5. Was there a particular scenario in game that you struggled to answer? If so why?
6. What is your overall opinion of the game?
7. What parts of the game did you enjoy?
8. What parts of the game do you think need improving?

Answers are saved in text files within the program's directory and then copied to a spreadsheet for collation.

There is an expectation that some players are not going to take the game seriously and will answer the questions based on what appears the most fun. Some of the ethical dilemmas test this expectation, for instance scenario 3 and scenario 5. However, the first five questions of the endgame questionnaire will discover this. Participants who do not take the game seriously will impact the objective of this dissertation. If players mostly play for what amuses them, then it will show that video games are not an appropriate medium to produce accurate ethical decisions. Expectations for the answers for each ethical dilemma are stated in the 'Ethical Scenarios' section in 4.1.

1. A detailed description of the procedure

4.2.3 Results

Ethical Dilemma Questions

Ethical Dilemma	Number of People Who Chosen it
1) Pay Patient Expenses	3
1) Do Nothing	7
2) Save Five Adults	8

2) Save One Child	2
3) Save Friend	9
3) Save Unknown Woman	1
4) Save Mortgage Lender	8
4) Botch the Operation	2
5) Sacrifice Self to Save Girl	0
5) Declare You Can Do Nothing	10

Figure 11 Table to Show Distribution of Ethical Decisions

Justifications for Ethical Scenarios (samples)

Scenario 1

“I have a duty to protect patients.” – No1 on why they decided to pay for patient expenses.

“It's not my responsibility to pay for the medical bills since I'm a doctor. I have a duty of care but not to pay for them.” – No5 on why they chose to not pay for patient expenses.

Scenario 2

“5 lives saved is better than just saving 1, even if it's a child” – No9 on why choose five adults over one child.

“A child has more time to live their life compared to adults.” – No6 – on why they decided to save the child over 5 adults.

Scenario 3

“Because there was an emotional connection to the friend, and I wasn't given the opportunity to talk to the stranger before making the decision” – No2 – on why they choose to save the friend over the stranger.

“Personally, I would choose the friend but since events in this game have consequences, I wanted to see what would have if I saved the woman” – No7 on why they choose to save the woman.

Scenario 4

“It’s inhumane to let someone die for personal gain” – No10 on why they decided to save the mortgage lender.

“He threatened my livelihood with eviction.” – No4 on why they decided to not save the mortgage lender.

Scenario 5

“I can do more good now as a doctor, if I gave my heart away other patients in the hospital could die” – No3 on why they chose not to give their life away.

“I’m not a doner.” – No5 on why they chose not to give their life away.

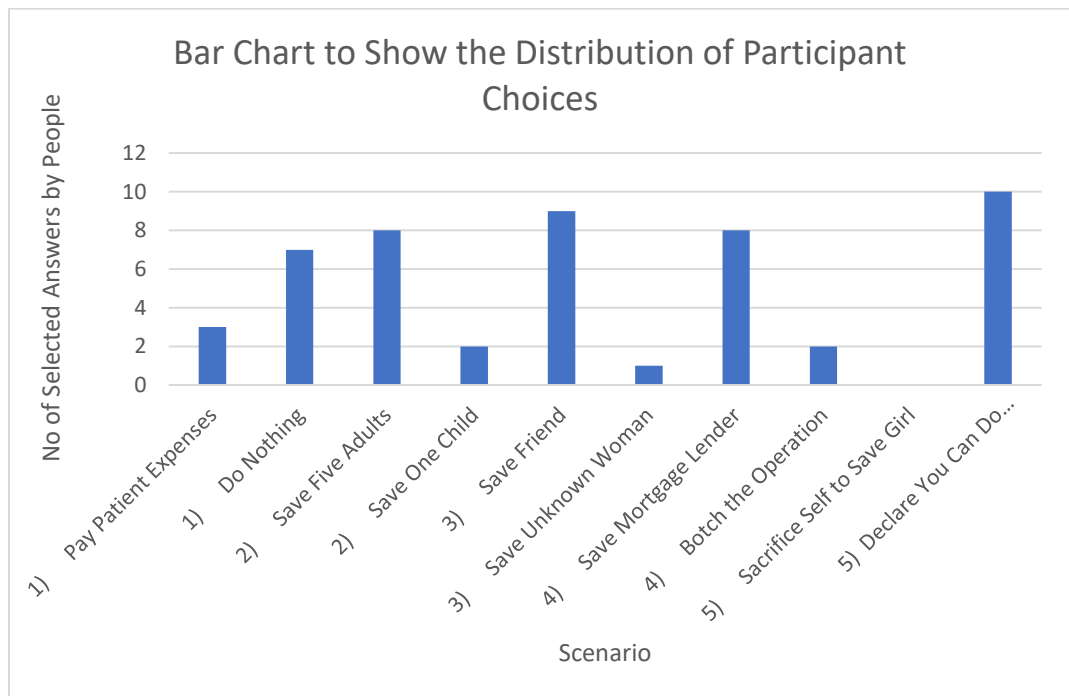


Figure 12 Bar Chart to Show Distribution of Participant Choices - Made in Excel

Final Questionnaire Answers (samples)

Question 1 - Did you feel like you were playing yourself in a game or a character? –
Did you relate to the character in any way?

“A character because I am not a doctor, but in some sense, I feel you could relate in a way to the concept of right and wrongdoing” – No3

“I felt like I was playing myself in the game. Related to the stress of the character.” – No6

Question 2 - Did you see this as an insightful experience or just a simple game to play?

“Insightful experience as it gave hard decisions that could not be avoided.” – No10

“Simple game to play” – No7

Question 3 - Do you think you would have taken the same decisions in real life?

“Yes, but in real life it would be more difficult because it is not a video game.” – No9

“No. I would have saved the child instead of 5 adults.” – No5

Question 4 - Do you regret any of the decisions you took? Which decision did you regret and why?

“Possibly the friend one but I was given no information on the stranger until after the decision” – No2

“No because there is a valid reason to pick either option and none of them are necessarily correct.” – No5

Question 5 - Was there a particular scenario in game that you struggled to answer?
If so why?

“I was conflicted on the first question since it is not the doctor's role to pay on behalf on patients” – No1

“The 1 child and 5 adults because although i prioritised multiple lives not saving a child was still difficult” – No2

Question 6 - What is your overall opinion of the game?

“Insightful, interesting, stressful.” – No6

“The game was very good and suited its purpose of forcing hard ethical decisions.” – No8

Question 7 - What parts of the game did you enjoy?

“I like the challenge of the dilemmas and the additional dialogue in the game providing context” – No4

“The fact that the decisions had an impact outside of the week, such as the letters that were sent to the house.” – No2

Question 8 - What parts of the game do you think need improving?

“Better looks to the game. More interesting design.” – No6

“More suspense to events and being able to talk to the patients.” – No7

4.2.4 Discussion

This section will go over the results in a comprehensive discussion, reflecting on results and observing expectations against outcomes. Conclusions made about the results are covered in the ‘Conclusions’ section.

Choices

Overall, there were no evenly split choices in any of the dilemmas, with most people favouring one option over the other. The largest disparity was 7-3 with the smallest being 10 – 0.

Scenario 1 - Patient in Coma

In the first scenario most people preferred to not pay for the patient’s expenses with seven people choosing not to pay against three who did decide to pay. Justifications for deciding not to pay include:

“A doctor would not offer to pay for a patient it's not their job”

“a random patient I am looking after does not get special treatment”

“not my responsibility to pay”

“If I knew the patient it may have been a different decision”

This shows that participants largely look at the situation as a state of fairness, where no patient in the hospital should get additional help compared to others, thus making it a matter of principle. Also, some made the point that it is not a part of their role, this shows that they act in accordance with what is expected of them and do not let personal ethics get in the way of their role. In summary, the answers show most participants took a deontological point of view when answering this dilemma. This is because they stuck to the principles and rules of being a doctor, letting Peter die is not of the fault of the participant, therefore they have no obligation to help pay.

Since this is the largest disparity in answers there were three people who did choose to pay for the expenses. Justifications included:

“I have a duty to protect patients.”

“I felt bad about leaving them. It's the most humane thing to do.”

“If I can afford it, it's worth trying to save a life”

The three participants who choose to pay seem to have different ways of justifying what they did. On the one hand one participant argued that it is a matter of ‘duty’ to save the patient. On the other hand, one participant seems motivated by their own conscience on the matter. On the last hand, one participant argues from a Utilitarian perspective, stating a cost/benefit analysis. There is less consistency by the participants on this answer, giving different rationale for what they did, however all seem to be motivated to do a good thing implying they aspiring to be virtuous.

Scenario 2 – 5 vs 1

In this answer the disparity decreased with eight participants choosing to save five adults and two saving the child. Justifications for saving five adults over the child include:

“Obviously saving five people is better than one even if it is a child. Collectively, they likely have more life left collectively than the child does.”

“a child is not superior to an adult”

“The needs of the many outweigh the needs of the few. It's the lesser of two evils.”

“5 lives saved is better than just saving 1, even if it's a child”

Most answers give a Utilitarian point of view on this dilemma suggesting that “the needs of the many outweigh the needs of the few” even with a child impacting the analysis the participants stuck to their philosophy. However, there was one unexpected justification in this answer. One participant stated “a child is not superior to an adult” showing that having a child die instead of an adult made no difference to their decision. This could imply that some people in society do not place the life of a child above those who are adults, or it could imply that they are not playing the game scenarios the same way as they would in real life.

Nonetheless, two people did choose to save the child. Justifications for this were:

“A child has more time to live their life compared to adults.”

“Personally, I couldn't just let an innocent child die”

The two participants seem to have difference in their answers. On the one hand one participant makes a logical argument regarding time left in the child's life. This seems Utilitarian but instead of basing it on lives saved, it is based on total time of life left. On the other hand, the other participant was heavily motivated by

conscience and acted on emotion rather than logic. They appealed to the innocence of the child. This person has likely valued the life of a child higher than five adults, using innocence as a justification.

Scenario 3 - Friend or Female?

The disparity decreased again in this answer with nine participants choosing to save the friend and one person saving the unknown woman. Answers for saving the friend included:

“I choose the friend because you know him as a good person whereas the other person I didn't know.”

“I knew Jeremy was a Doctor so I knew he could save lives in the future whilst I had no information on the stranger.”

“Regardless of the consequence of losing the stranger, a friend is always the better option for me.”

“I'm going to save someone I know rather than someone who I don't. His kid needs a dad. The other person had no information on their background.”

Overall, the consensus of the answers is having knowledge of one person against no knowledge of the other. This falls in line with expected results. Having a woman in the equation had no impact of the answer choice or the justifications. Although, the consensus was on knowledge of the patients, the justifications differed. Some people said that they would choose Jeremy because he is their friend whereas others say he is known as a good person and a medical professional who can save lives. Knowing someone is a good person seems to be a good gauge into justification into saving that person. Since all the knowledge of Jeremy was positive, it made sense why he was saved.

Despite a largely one-sided dilemma, there was still one person who choose to save the woman. This is what they stated:

“Personally, I would choose the friend but since events in this game have consequences, I wanted to see what would have if I saved the woman”

This is evidence that one participant was playing the game in a more experimental manner and answering the questions based on curiosity rather than what they would really do. They also state that they would save the friend in this situation, proving that there is a consensus on what option people would pick in the scenario. *To conclude adding a woman into the analysis is irrelevant to the impact of the dilemma.*

Scenario 4 - Kill Your Enemy?

Disparity increased back to 8 – 2 on this one. The majority choose to save the mortgage lender’s life. These are some of their answers:

“It’s inhumane to let someone die for personal gain”

“Saving a life is the most important thing, shouldn’t be selfish as a doctor.”

“Regardless of my negative experience with someone, the right thing to do is to save them.”

“I’m a Doctor, I have taken the Hippocratic oath. I have a duty of care.”

The vast majority have taken a deontological point of view, seeing the deliberate taking of someone life as an absolute wrong, even if there is some personal gain to it. Participants have described it as not being selfish, not being inhumane or the right thing to do. One participant however argued more as a matter of Doctoral principle stating that they are bound by an oath to take care of patients. Some may see this as a motivation of their career rather than a conscience decision.

On the other hand, two people did botch the operation and kill the mortgage lender. Their justifications were:

“He threatened my livelihood with eviction.”

“I wouldn’t do this is real life but in game, he threatened me and my family. I have to protect them”

One participant took a cynical point of view seeing the removal of a threat to their livelihood as justified even if it means killing them. The other clarified that this is not what they would do in real life but took a Utilitarian point of view to save their family (the many) at the expense of the mortgage lender (the few).

Scenario 5 – Sacrifice Yourself?

This answer met a complete consensus with all ten participants choosing not to sacrifice themselves to save the dying girl. Their justifications were:

“there’s no heart donors, if I wanted to donate my heart clearly, I would already be on the list”

“I can do more good now as a doctor, if I gave my heart away other patients in the hospital could die”

“If I die, then I lose the ability to save more people in the future.”

“The other patients and my family need me.”

“I am not a doner”

Participants have no indication of regret in decision, having a clear reason why they will not go through with it. Some answer simply that they are not an organ doner whereas others argue that they can save more people by staying alive. One argued that their family needs them. Based on the list of answers, most lean towards a Utilitarian point of view. This is because they know that they can save more lives by not sacrificing themselves, therefore letting the girl die is worth it in the long-term. Others answered that they were not an organ doner. Regardless of the circumstances they would have not gone through with just based on that one factor. Another point is that if some participants were playing through the game for fun and not seriously, they likely still would not sacrifice themselves.

Chapter 5

Conclusions

The main purpose of this project is to see if people approach hypothetical scenarios in an interactive simulator the same way as they would in real life. This project approaches ethical dilemmas similar to other ethical concepts and scenarios discussed in literature. For instance, the trolley problem is analogous to the game with it being reflected in a hospital scenario with patients requiring medicine as opposed to people on a rail track. The idea behind this is to keep the academic literature relevant whilst building an interpersonal story to a player to accurately answer various scenarios. Placing participants as a doctor in a hospital helps build a more realistic background for the dilemmas taking place. With this apparatus in place the title of this study can be answered. Can video games be used as a method of producing accurate ethical decisions. This conclusion will analyse if this can be done.

Overall, the participant's answered the moral dilemmas mostly in line with expectations. This strongly indicates that people will try to choose the most moral action in a video game. Evidence for this is in the following table:

For the dilemma of 'Patient in Coma' the expectation was that the results could go either way, because one option was consequentialist and the other deontological. The results show this had the largest disparity in the answers with seven people choosing not to pay for the patient. Expectations were met in this case.

In the case of the '5 vs 1' the literature indicates that everyone would choose five over one, however with a child as the one patient, there was an expectation that some would save the one child over the five adults, even if it means more people die. The results lined up as expected with two people saving the child and eight people saving the five adults.

In 'Friend or Female' expectations from Tom Smith's thesis indicated that most people would choose to save a woman over a man, however since knowledge of the man and being a friend of the doctor was an impact on the dilemma. The expectation was that all would pick the friend despite the other patient being a woman. The results were heavily in favour of expectations with nine out of ten participants choosing to save the friend.

Expectations for 'Kill Your Enemy' were the following. Due to the intensity of this scenario the expectation was that the majority would choose to save the mortgage lender, choosing to be completely deontological in their assessment. However, since it is a video game some may choose to be Utilitarian view, seeing their family as more important than the mortgage lender's life. The results matched the expectations. Most of the participants (8/10) opted to save his life due to it being the right thing to do and because of their duty as a doctor. Two did choose the darker route, stating that the mortgage lender was a threat to their livelihood, although one person admitted they would not do it in real life. This shows that video games do not always line up with real life expectations since video games give a person freedom from real life consequences.

In the final scenario, not a single participant opted to take the 'Sacrifice Yourself' option. This was met in line with expectations. This dilemma was perhaps the most extreme of them all and acts more closer to a test than part of an intrinsic discussion on ethics. Even if a participant was not taking the ethical dilemmas seriously then it is likely they still would not sacrifice themselves for the girl. The most likely reason for this is that people who play for fun will likely play the game more selfishly and therefore choose not to die.

Results from question 3 at the end of the game show that the majority *would* answer the same way in real life as they would in the game. This came out to seven who would and three who would not. One of the three stated that they would have saved the child instead of the adults (in-game they did the inverse). They further stated, "seeing the actual child in real-life would have made me

save them”. What this shows is people are emotionally limited through a game considering it is not real, which seems to show that people may act more logically in a video game compared to real-life where they would act emotionally.

Another person stated that they would not because they would, “absolutely refuse to take part in the decisions”. This is another indication that the lack of realism in games make people act different than they would in reality. However, it also shows that video games can be a good use of creating hypotheticals since the participant still answered the dilemmas in game.

The last person who said they would answer the dilemma differently stated, “I was more interested in what would happen after each event. In real life I would take it more seriously.” What can be learned from this is that not every individual will play games with the same mindset. Rather than acting on morals or ethics, some people may act on curiosity or seek a more adventurous story at the expense of moral actions. Since video games are intended for entertainment there may be difficulty in changing the perspective of gamers from an entertainment aspect to a moral dilemma mindset. As such, any future use of video games as a method of producing accurate ethical decisions would need to bear this in mind.

In summary, it is fair to state that accuracy of the ethical dilemma expressed would be at 70%. One participant stated they would not take part in any of the decisions in real life, yet they still answered all questions in game. This indicates that the video game worked as a hypothetical if they did have to answer the dilemmas, although they would not have answered them at all in reality. Although 70% seems like a success one factor that would put this into question is the small sample size of the participants. Due to constraints caused by the Coronavirus pandemic, obtaining participants for this study came with additional challenges. Housemates and contacts on Discord were the only viable options to stay in line with lockdown rules. The type of participants that played was also a factor in influencing results. All the people that played were in their early 20s

and as such gave the results a narrower perspective. If the demographics of the participants were more diverse, the results may have been different.

In conclusion, based on the evidence, future studies can use video games to test ethical dilemmas. Although there was a low sample size, this was a qualitative study and participants gave open feedback for each dilemma justifying why they did it. Also, most people stated they would answer the same way as they would in real life, thus suggesting that the video game is producing accurate results. On reflection more study is needed to find a definitive answer. The use of Virtual Reality can be a way to increase the sense of realism with the player and the game, and lead to even higher rates of accuracy. Yet, this study does have an answer to the title and has found that video games can be used as a method to create accurate ethical dilemma despite the small sample size. The qualitative results are indicative of this and the answers they give mostly match up with expectations, indicating that most people take it seriously. On balance the study has been a success that met up with expectations.

Chapter 6

Reflective Analysis

Overall, the project started well and ended well with some issues and challenges along the way. The first and most obvious was the Coronavirus pandemic. This effected the sample size that could be deployed for the playthrough of the game. Despite this it went rather well considering this game needed qualitative data rather than quantitative data. This was all provided. Feedback for the game suggested that the graphics could be improved. I agree with this since a better-looking game would help grab players a bit more and got them to engage closer. One participant wanted more interaction with other characters (especially the family). I also agree with this assessment because having a strong story related background to the main character was a core concept of the game.

In summary I would consider this dissertation a success. The results were in line with expectations and overall feedback for the game was very positive. Some reviews stated:

“A good brain thinker to consider good and bad actions and consequence”

“It was eye-opening because the questions were inquisitive”

In retrospect I would have liked to dedicate more time to building a better-looking game. Also, I would have liked more participants to boost the sample size and get a better overall array of results. Despite these drawbacks, I am proud of what I have achieved here.

References

- Aad, Georges et al. (2012). ‘Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC’. In: *Physics Letters B* 716.1, pp. 1–29 (cit. on p. 2).
- Becker, L. and Becker, C., 2003. *A history of Western ethics*. 1st ed. New York: Routledge.
- Calp, M. and Akcayol, M., 2019. *The importance of human computer interaction in the development process of software projects*. [online] arXiv.org. Available at: <<https://arxiv.org/abs/1902.02757>> [Accessed 12 May 2021].
- Chatrchyan, Serguei et al. (2012). ‘Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC’. In: *Physics Letters B* 716.1, pp. 30–61 (cit. on p. 2).
- Clement, J., 2021. *Global video games market value 2021 | Statista*. [online] Statista. Available at: <<https://www.statista.com/statistics/246888/value-of-the-global-video-game-market/#:~:text=In%202018%2C%20the%20market%20was,surpass%20138%20billion%20by%202021.>>> [Accessed 1 May 2021].
- Gensler, H., 2017. *Ethics: A Contemporary Introduction*. 1st ed.
- Glennon, J., n.d. *2020's most controversial video game reveals the worst thing about fandom*. [online] Inverse. Available at: <<https://www.inverse.com/gaming/last-of-us-2-goty-abby-controversy>> [Accessed 1 May 2021].
- Hart, C., 2019. *Is It Always Wrong to Lie?*. [online] Psychology Today. Available at: <<https://www.psychologytoday.com/gb/blog/the-nature-deception/201906/is-it-always-wrong-lie>> [Accessed 4 May 2021].
- M., L., 2019. *Review: Phoenix Wright Ace Attorney Trilogy (Sony PlayStation 4)*. [online] Digitallydownloaded.net. Available at: <<http://www.digitallydownloaded.net/2019/04/review-phoenix-wright-ace-attorney.html>> [Accessed 10 May 2021].
- Pohl, K., 2008. *Ethical Reflection and Emotional Involvement in Computer Games*. [online] Potsdam. Available at: <https://publishup.uni-potsdam.de/opus4-ubp/frontdoor/deliver/index/docId/2564/file/digarec01_05.pdf> [Accessed 5 May 2021].

- Rahran, I., 2016. [online] Ted.com. Available at: <https://www.ted.com/talks/iyad_rahwan_what_moral_decisions_should_driverless_cars_make> [Accessed 4 May 2021].
- Robbins, J., 2020. *18 Super Messed Up Decisions Video Games Have Forced You To Make*. [online] Ranker. Available at: <<https://www.ranker.com/list/moral-dilemmas-in-video-games/jason-robbins>> [Accessed 6 May 2021].
- s.n., 2016. *Moral Machine*. [online] Moral Machine. Available at: <<https://www.moralmachine.net/>> [Accessed 9 May 2021].
- s.n., n.d. *BBC - Ethics - Introduction to ethics: Virtue ethics*. [online] Bbc.co.uk. Available at: <<https://www.bbc.co.uk/ethics/introduction/virtue.shtml>> [Accessed 4 May 2021].
- s.n., n.d. *Deontology - Ethics Unwrapped*. [online] Ethics Unwrapped. Available at: <<https://ethicsunwrapped.utexas.edu/glossary/deontology>> [Accessed 7 May 2021].
- s.n., n.d. *Waterfall Model: The Ultimate Guide to Waterfall Methodology*. [online] ProjectManager.com. Available at: <<https://www.projectmanager.com/waterfall-methodology>> [Accessed 6 May 2021].
- s.n., 2021. *TOP IDE Top Integrated Development Environment index*. [online] Pypl.github.io. Available at: <<https://pypl.github.io/IDE.html>> [Accessed 9 May 2021].
- s.n., n.d. *Agile Vs Waterfall: Know the Difference Between Methodologies*. [online] Guru99.com. Available at: <<https://www.guru99.com/waterfall-vs-agile.html#:~:text=Waterfall%20is%20a%20Linear%20Sequential,in%20the%20software%20development%20process.&text=Agile%20allows%20changes%20in%20project,once%20the%20project%20development%20starts.>> [Accessed 7 May 2021].
- s.n., n.d. *What Is Agile Methodology in Project Management?*. [online] Wrike.com. Available at: <<https://www.wrike.com/project-management->>
- Shafer, D., 2012. *Moral Choice in Video Games*. [online] Media Psychology Review. Available at: <<https://mprcenter.org/review/shafermoralchoicegames/>> [Accessed 1 May 2021].
- Sharp, H., Rogers, Y. and Preece, J., 2019. *Interaction Design*. 5th ed. Wiley & Sons Canada, Limited, John.
- Velasquez, M., Andre, C., Shanks, T., S.J and Meyer, M., 2010. *What is Ethics?*. [online] Scu.edu. Available at: <<https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/what-is-ethics/>> [Accessed 1 May 2021].

Zagal, J., 2009. *Ethically Notable Videogames: Moral Dilemmas and Gameplay*. [online] Digra.org. Available at: <<http://www.digra.org/wp-content/uploads/digital-library/09287.13336.pdf>> [Accessed 7 May 2021].

[guide/faq/what-is-agile-methodology-in-project-management/](#)> [Accessed 9 May 2021].

Appendix

Game Design Document

Game Summary

A quick summary of the game / high level big picture.

- Set in a hospital
- Play as a doctor examining patients
- Ethical dilemmas come to the player
- Player must choose, choices will affect the story
- All answers and time taken will be collected as data, which will later be measured and discussed in detail.

Target Platform(s)

- PC
- 1st person
- Landscape orientation

Business Model

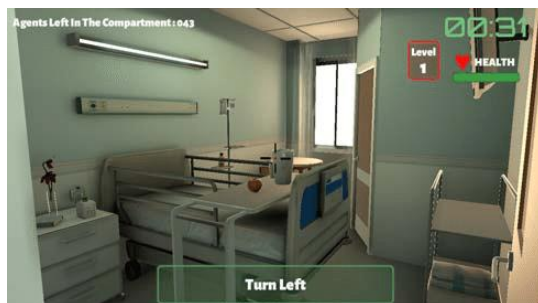
Study/project – will be free to participants

Game Overview

Theme / Setting / Genre

Show some example images or similar games / movies / books / TV shows with similar themes.

The player will find themselves playing as a doctor in a hospital. They will move around the hospital in 1st person. Speech will be represented via textboxes.



Core Gameplay Mechanics

Point to other games that this is similar to.

- 1st person perspective taking place in an indoor environment. An example of environment is the game: The Stanley Parable shown below.



- Telltale games.
- Visual novel games such as Phoenix Wright: Ace Attorney Trilogy as an example of what speech in the game will look like.



Research Question

Will people take ethical decisions seriously in a game environment?

In a game setting, will individuals take ethical decisions seriously?

Story and Gameplay

Story

Day 1

1. The game describes the player's role to them after they enter their name.
2. Story begins with player saying goodbye to wife and kid and leaves for work.
3. Game cuts to player walking to receptionist and signs in.
4. Chat with the male friend at work before 1st scenario. He states he will be a father soon.
5. Player walks to ward where the first dilemma takes place.
6. Patient is on life support. Family cannot pay to keep him alive. Will the player cover the patient expenses? Relatives need to keep paying for family member. The player can choose to pay for their bill and lose money or pull the plug and keep the player money. The doctor's family need money but can the player leave this family in despair? Player's choice will affect the rest of story.

Day 2

7. Next day. If patient expenses are covered, the player are behind on mortgage payment. If not, receive a letter of grief from patient's relative.
8. Mortgage lender is given identity (this is relevant later)
9. 1st scenario of day: Nurse informs the player that there is a series dilemma. 6 patients require a lifesaving dose of medicine. There is enough for a group of five adults to be shared amongst them however a child requires the entire dose of medicine to live. The player must make a decision. Save five people and let child die or save child and let five people die.
10. 2nd scenario. Save male friend the player chatted with on day one (needs lifesaving surgery) vs female stranger who requires the same. Only the player can save one.

Day 3

11. 3rd day. If player decided to cover the patient's expenses on day one, then the doctor's family are faced with eviction.
12. See receptionist etc
13. Walk to operating theater. Urgent surgery is needed on patient. Patient is the mortgage lender. Will you save him?
14. Organ transplant needed for child. Will you give yours away? (A reflection of the burning house scenario)

Story will be told through in-game text to inform the player of events and context. Other characters speech will be shown through textboxes.

Core Gameplay

The player will find themselves playing as a doctor in a hospital. They will move around the hospital in 1st person. Speech will be represented via textboxes.

User Interface / Screens

When player enters target room, this becomes a 'scene' where the game takes over the controls of movement. The player can only change to the next part of dialogue or choose the decision of the dilemma.

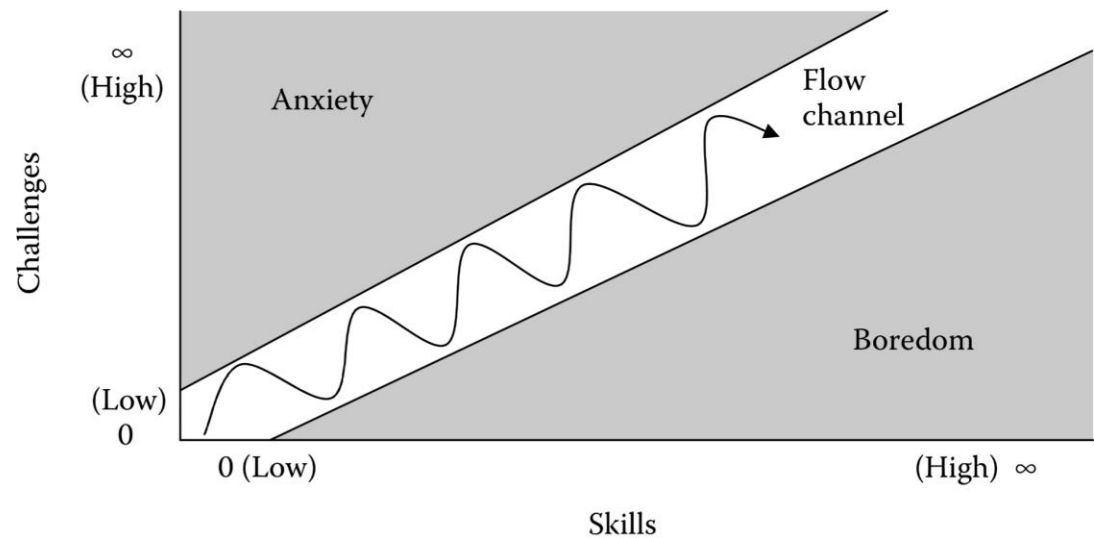
Main Menu

- Game title at top of screen with participant number in top right
- "Play" Button in the center. This starts game.
- "Settings" at bottom left (administrator only)
- "Credits" at bottom right

Levels

- Day 1 – easiest

- Day 2 – medium
- Day 3 - hardest



Level Design

Narrative (Describes each scene)

- All dialogue is shown as text boxes at the bottom of the screen
- Questions are done daily for accurate response

Day 1

Scene 1 – Doctor at home with wife and daughter (functions like a cutscene, the player does not control the character). Simply contains dialogue, no animations except text. Fade to black.

Scene 2 – This scene is where the player can control the character. Player walks to hospital reception starting at the entrance door. Checking in will create dialogue boxes to appear for the conversation. After checking in, the doctor meets his friend who walks to the reception to greet the player.

Scene 3 – Player will walk to the ward through the door and down the corridor.

Scene 4 – Ward scene. Adult (20ish) patient on life support with family there with him. Mother and father at the bedside. Player at the door. Player will lose control of character to allow the dialogue to carry through. After the dialogue is complete the dilemma will be shown to the player with two options. Save or not save. They will have **10 seconds to decide**. After decision is taken there will be dialogue between the player and the parents about what will happen. Scene ends.

Questionnaire 1

1. Why did you choose to save the patient? OR
2. Why did you choose to not save the patient?

Day 2

Scene 5 – At home again. Same background as scene 1. A letter comes up on screen reading one of two things depending on the decision in scene 4.

- Outcome 1 - It will either be a letter of grief from family as feedback to pulling the plug
- Outcome 2 - A letter received by the mortgage lender (in person) about mortgage payment.

Scene 6 – At reception again. Nurse will walk to player and inform the player of serious dilemma. This is outlined in the story section. 5 vs 1. **6 second counter.**

Scene 7 – Player observes body bag(s) leaving the ward depending on their decision. Player walks to the nurse in reception room who informs the player of the next dilemma of the day.

Scene 8 – The player will walk to the ward again. There will be two ward beds – one will have the player's friend from day one whilst the other bed will have an unknown female. **6 second counter.**

Scene 9 – If player saves friend there will be dialogue with him after the decision is made. If they save the women, there is no dialogue and the game moves on.

Questionnaire 2

1. Why did you choose to save the child over the five people? OR

Why did you choose to save the five people over the child?

2. Why did you save you friend instead of the stranger? OR

Why did you save the stranger instead of the friend?

Day 3

Scene 10 – Scene starts with the player observing an eviction notice in front of them if they covered patient expenses. If they did not cover patient expenses this scene does not happen.

Scene 11 – At reception, the receptionist informs the player they are urgently needed in the operating theater. The player will freely walk to the operating

theatre (next to the ward) and observe the patient. He is identified as the mortgage lender. Decision message comes up on screen. Will you save him or botch the operation? **4 second counter. (The idea here is that if the player does face eviction, then they should save him. If they don't then they are not playing with a moral mindset)**

Scene 12 – If player saves him, he will forgive late payment if player has received an eviction notice.

Scene 13 – Nurse informs player that there is a child who needs urgent medical assistance. Player will walk to the ward where the child is. Doctor by the bedside informs the player that the girl needs a heart transplant urgently and none are available. The final dilemma is shown to the player. **4 second counter.**

Scene 14 – The player will choose between sacrificing themselves via donating their heart or walking away. The outcomes are as follows:

- The doctor chooses to donate their heart. In this case the screen will fade to black and text will appear in the centre of the screen informing the player the events after.
- The doctor walks away. In this case the doctor will return home to their family and seemingly show a happy ending, however after the screen fades to black the game will inform the player that the girl could not obtain a donor in time and that she died in hospital.

Questionnaire 3

1. Why did you save the mortgage lender? OR

Why did you choose to walk away?

2. Why did you choose to save the child? OR

Why did you not save the child?

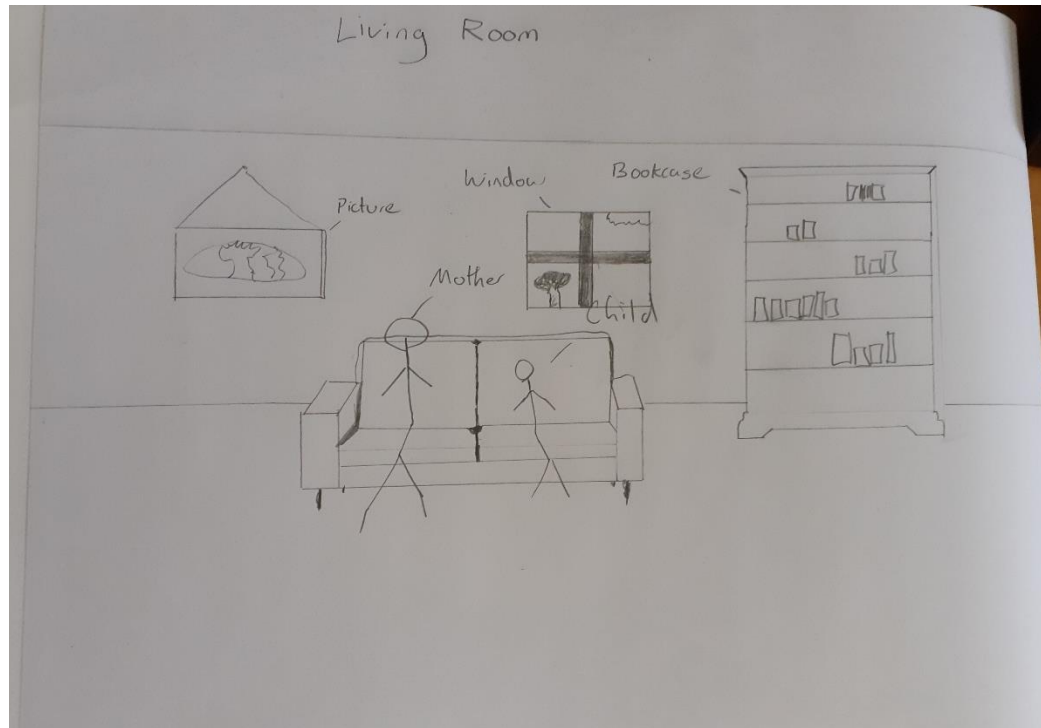
- Game Over. Thank you for playing. There are a few more questions to answer.

Questionnaire 4

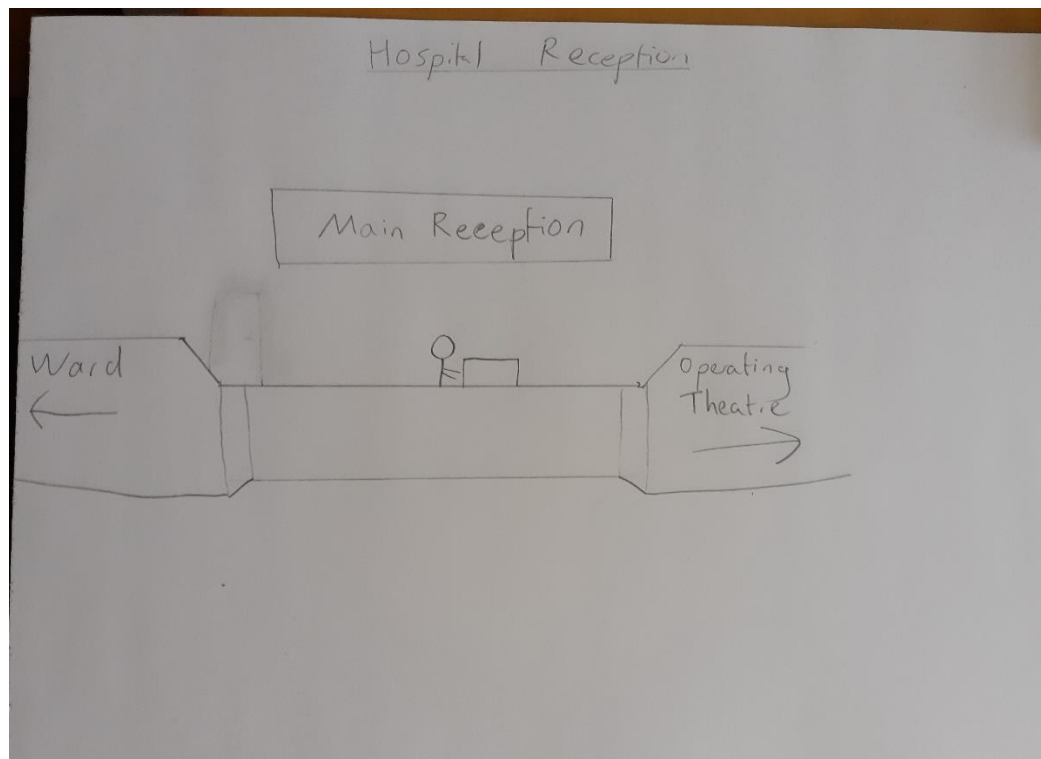
1. Did you feel like you were playing yourself in a game or a character? – Did you relate to the character in any way?
2. Did you see this as an insightful experience or just a simple game?
3. Do you think that you would have taken the same decisions in real life?
4. Do you regret any of the decisions you took? Which decision did you regret and why did you regret it?

Level Design (incomplete)

Living Room



Hospital Reception



Decision Flowchart

