

Narrative as an Aid for the Doctor-Patient
Relationship in China

by
Yao Tong

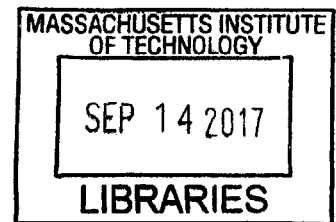
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Abstract

In recent years, the incidence of violence against Chinese doctors has increased dramatically, with the scale, frequency and viciousness of attacks shocking the world. The challenging doctor-patient relationship remains a complicated issue with no single cause. When the tension intensifies, some news media tend to blame the doctors, using misleading narratives to create sensationalism, thereby aggravating the antagonism between the society and medical professionals. Much scholarship has focused on exploring the social, economic, political, legal, and medical aspects of the doctor-patient relationship. In contrast, little research has been done to interrogate the media's role in contributing to the tension. Additionally, although most studies are concerned with proposing suggestions, no study has posed an intervention to combat the twisted depictions of doctors and to abate the worsening doctor-patient tension. To this end, this thesis examines the role of the media to provide an explanatory analysis of its influence on the doctor-patient relationship, and then leverages on the power of narrative to offer an intervention as an aid to the current doctor-patient tension. User feedback has been collected and analyzed to measure the effectiveness of this project. The aim of this intervention is to help promote perspective taking, increase awareness, and foster understanding toward medical professionals in China.

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Chapter 1

Introduction

1.1 A True Story: The Killing in Harbin

In the cold afternoon of late March 2012, when Li Mengnan, a 17-year-old boy, hobbled into the First Affiliated Hospital of Harbin Medical University in northern China, several people's fate would be forever changed. Li was from a rural town in Inner Mongolia—a ten-hour train ride away—and he had visited the hospital five times in two years. He had been suffering from an excruciating inflammation of the spine called ankylosing spondylitis, which during the past two years got severely worse. Earlier that day, when he arrived at the hospital, he was told to do an X-ray in a clinic across town and bring back the documentation with him. When he returned and presented all of the relevant paperwork, a senior rheumatologist told him they could not treat his spinal problem due to his tuberculosis history.

Knowing that he would have to go back home with his illness completely untreated, Li left the hospital and went back to his hotel across the street. He told his grandfather, who had accompanied him all the way to Harbin, that he wanted to go out for a walk. However, he walked to a store nearby and returned to the hospital with a three-inch fruit knife. He was looking for the doctor who had refused to treat him, but he ended up retaliating against the first person he saw when he came out of the elevator. Wang Hao, a 28-year-old intern doctor who was not involved in Li's case, unfortunately became his first target. Wang was fatally stabbed when Li

plunged the blade so deep that Wang could not even manage to call out for help. Li then proceeded to turn on others, slashing three more doctors, seriously injuring them.

1.2 Doctor-Patient Relationship: The Status Quo

The killing in Harbin attracted national attention and unnerved medical professionals. The doctor–patient relationship, which has always been regarded as a keystone of healthcare [30], was once again brought into the spotlight. The Chinese business weekly *Caixin* spoke of this incident as “doctor–patient conflict,” [10] and an editorial in *The New Yorker* warned that “Chinese patients are turning against their doctors,” [8] with a striking illustration featuring a stethoscope hanging before the salient Chinese red flag.

The killing in Harbin was not unique. Statistics from China Hospital Association [55] reveal that the number of violent incidents against medical staff grew from 57 in 2010 to 130 in 2013. The survey also showed that the number of assaults per hospital escalated from 20.6 in 2008 to 27.3 in 2012. According to a report in *Beijing Daily*, since 2000, violence against medical workers has been increasing 11% annually. From 2011 onward, the incidence of doctor–patient disputes has been increasing at an annual rate of 35% [50]. Statistics from the Supreme People’s Court indicate that the number of incidences of the doctor–patient dispute has risen from 9079 in 2003 to 16966 in 2012 [3]. In addition, a Ministry of Health survey shows that the number of occurrences of medical disturbances has increased from 10248 in 2006 to 16448 in 2009, and to 17243 in 2010 [9]. According to a report from the Chinese Medical Doctor Association in 2015 [1], about 73% of doctors in China have experienced assaults from their patients, with 60% of them being verbally abused and 13% of them physically assaulted. In recent years, the tension between patients and doctors continued to grow, and it culminated in May 2016, the darkest period ever in Chinese medical history, during which more than five doctors across the country were violently killed by former patients, prompting renewed protests by medical professionals and

campaigns on social media supporting and commemorating all besieged doctors [18].

Scholars have commented that recent years have witnessed a worsening of the doctor–patient relationship [54]. However, it is also important to note that violence toward medical professionals is not a new phenomenon, despite the wide range of media coverage in the past few years. Researchers have documented notorious cases of violence against doctors from 2000 to 2009, and more than a hundred cases were recorded with abundant details (see [54] Appendix 1). The scale, frequency and viciousness of the documented attacks should have grabbed the attention of the media and relevant government departments. However, most of these incidents went unnoticed. The number of media reports on those attacks was scarce, and related departments such as the Ministry of Health have not proposed any solutions or guidelines in face of the challenging situation. Only in recent five years have people started to realize the importance of this issue [54].

As alarming as the status quo of medical staff is, what is even more appalling was the public’s reaction to violence against doctors. *People’s Daily*, the Communist Party mouthpiece, set up an online poll to survey people’s attitudes toward the killing in Harbin [33]. Among 6161 participants who responded to the survey, 65% of the respondents selected “happiness,” endorsing Li’s violent action. Only 14% of the participants selected “anger,” and 6.8% chose “sadness.”

Although the participants might not be representative of the entire Chinese population, the poignant statistics did reflect the worrisome reality: relationships among doctors, patients and the health system are becoming increasingly problematic, if not incorrigible. And people’s benevolent image of doctors is being turned upside down. A few Chinese patients hold the opinion that doctors act in collusion with hospitals to conduct unnecessary examination and treatment, thereby increasing the financial burden on the patient side. How did they form such a skewed version of doctors? What made them think that they could sympathize with Li and legitimize his atrocity? Why do so many people perceive doctors negatively and show no pity for his death, as if he deserved to be treated that way?

1.3 Thesis Overview

The doctor–patient relationship is not only an interpersonal relationship but also a social relationship. Literally speaking, *doctor* refers to a person trained and licensed to practice medicine, whereas *patient* refers to a person under medical care or treatment. Broadly speaking, the doctor side includes the medical system of the entire country, including policies regarding medical insurance, security systems, drugs, and drug-approval policies. It also encompasses government departments such as the Ministry of Health, Drug Regulation Bureau, and insurance institutions [20]. Similarly, the patient side encompasses not only the patient but also family members and other relevant social connections. A tension is created when the interactive relationship between the two groups is in opposition or conflict [60]. This incompatibility can be expressed emotionally or behaviorally, and sometimes both. The doctor-patient tension, according to Zhu and Yuan [60], refers to the process of generating internal unsatisfactory feelings or external behavioral acts when the two groups are in a medical service activity. This thesis not only addresses the interpersonal relationship between doctor and patient but also highlights the systematic forces that create the tension between the two.

Admittedly, the media is not the fundamental factor that gave rise to the current tension, as it is neither the policy maker nor the policy implementer. However, the media is a powerful institution that has a direct influence on people’s beliefs, attitudes, and values and that impacts how people view the world. When the tension intensifies, some news media tends to blame the doctors [52], using misleading narratives to create sensationalism, thereby aggravating the antagonism between the society and medical professionals. That being said, when used properly, narratives could also be used to help heighten public awareness and foster greater understanding toward doctors.

Much scholarship has focused on exploring the social, economic, political, legal, and medical aspects of the doctor–patient relationship (See [53] for a comprehensive literature review). In contrast, little research has been done to interrogate the media’s role in contributing to the tension. Additionally, although most studies are concerned

with proposing suggestions, no study has posed an intervention to combat the twisted depictions of doctors and to abate the worsening doctor–patient tension. This thesis first examines the media’s role by providing an explanatory analysis of its influence on the doctor–patient relationship, and then leverages on the power of narrative to offer an intervention. I constructed—a visual novel game—as an aid to the doctor–patient relationship. User feedback has been collected and analyzed to measure the effectiveness of this project. This intervention aims to promote perspective taking, increase awareness, and foster understanding toward medical professionals in China.

The remaining chapters of this thesis are structured as follows: The background chapter includes an analysis of different types of tension in the current doctor–patient relationship, with an explanation of how the key themes in my game fit into the framework. The second section of the background chapter discusses the limited work that the media has done to address the doctor–patient tension. The background chapter concludes with a literature review of narrative across different platforms, which will be used as the theoretical foundation to construct an interactive narrative-based game for improving the doctor–patient relationship.

The thesis then shifts gears to discuss the project. The third chapter discusses the creation of my visual novel game called Doctor Simulator. The narrative formulation, plot analysis, technical implementation, and relevance to the doctor–patient relationship are all addressed. The fourth chapter summarizes the user feedback collected from the survey. The game is shown to be effective in perspective taking, identification, awareness and reflectivity. Gender and prior exposure to the doctor–patient interaction are considered as variables that potentially moderate the results. The fifth (final) chapter proposes better research methods and future works.

The doctor–patient relationship is a complicated issue with no single cause. The quality of the relationship depends on a variety of factors, including the government, society, the patient, the doctor, and the media. My project, however, is a pilot work that addresses one point of view of the doctor–patient issue—*patients do not fully understand doctor’s challenges, and the media exacerbates the tension.*

This thesis uniquely contributes in the following respects: First, the thesis ad-

dresses an underrepresented area of the doctor–patient relationship by offering a media perspective on the doctor–patient relationship. An understanding of the problems associated with the media could pave the way for future quality reports. Second, this thesis makes up for the gap in the doctor–patient literature by presenting an intervention—a visual novel game that promotes perspective taking and fosters awareness. Furthermore, the survey results confirm the game’s effectiveness, which fulfills its educational purpose and demonstrates the potential for making the game applicable for widespread use in the future.

Chapter 2

Background

2.1 Factors in Doctor-Patient Tension

In this section, I review the literature on the categories of the doctor–patient tension and use Zhu and Yuan’s classification model as a theoretical foundation for defining factors that drive doctor–patient tension. These factors are: Medical outcomes, medical skills, service attitudes, medical expenses, treatment length, and medical bribery [60]. Then I explain how the key themes in my game, namely ethics, medical decisions, interpersonal decisions and differing perspectives fit into the framework, and show how these factors play out in the scenarios created for the project.

2.1.1 Overview of the Current Categories

Several categories on doctor-patient tension have gained consensus among scholars. The first one is to categorize the doctor-patient tension as medical negligence disputes vs. non-medical negligence disputes. This categorization highlights negligence in medical practices. Another one is to classify the tension as iatrogenic doctor-patient disputes vs. non-iatrogenic doctor-patient disputes. This classification emphasizes the subject of disputes. Other more nuanced categorizations include but not limited to: Categorizing the tension based on fee, risk, patient delay, accident; and categorizing the tension based on reason, severity, misdiagnosis, scale, nature and intensity.

Although the categorization of the last one seems comprehensive, it focuses more on the incidence of tension itself and lacks investigation into the source of tension during the doctor–patient interaction [60]. To close this gap, Zhu and Yuan proposed a six-element framework—medical outcomes, medical skills, service attitudes, medical expenses, treatment length, and medical bribery—that categorized the doctor–patient dilemma based on the source of tension. This gives the reader a clearer sense of the types of tension that occur, which is more conducive for coming up with better solutions.

2.1.2 Medical Outcomes

This type of tension refers to the fact that patients consider the results of the medical practice to be below their expectations [60]. Sometimes the result is unsatisfactory because the doctor has made a mistake; sometimes the outcome is lower than expected because of the uncontrollable side effects that an operation generates. Notably, some complain about the outcome for the sake of money, and these people are referred to as Yi Nao (Chinese: 医闹; Literally: Medical Disturbances).

Yi Nao is categorized by organized and premeditated disturbing behaviors toward medical staff for the sake of monetary compensation. Sometimes Yi Nao gangs are organized criminal groups hired by the patients or their families; sometimes they are the patients or family members themselves. The people who initiate the disturbances usually claim to be victims of malpractice. In most cases, they use extreme methods (e.g., threatening litigation/a lawsuit) to pressure the hospital to compensate them. This phenomenon is illustrated in my first scenario, where the patient insists that the doctor failed to take care of his wound and demands that the hospital compensate him.

2.1.3 Medical Skills

This type of tension refers to the undesired treatment effect or pain experienced by the patient due to lack of medical skills [60]. These scenarios usually have the following

characteristics: First, the doctor lacks the medical skills necessary for the treatment, which causes new health issues and leads to a doctor–patient conflict. Second, the patient thinks that the doctor lacks the adequate skills to perform the operation well. Third, the doctor is equipped with necessary medical skills needed for a treatment but accidentally misdiagnoses the patient. This happens when the health condition is so rare that nobody has seen it before, or there are personal issues that have distracted the doctor’s attention. According to Zhu and Yuan [60], in daily medical activities, it is common to make a mistake such as giving a patient the wrong injection.

This type of tension aligns with my theme of medical decision-making, in which a life-and-death decision needs to be made within seconds. Such decisions require medical skills and experiences. In constructing the scenario for misdiagnosis, I created a scenario where the player discovered a misdiagnosis by a colleague. The misdiagnosis was common and could serve as a case study for the department. You wanted to inform all your colleagues about this representative misdiagnosis so they could learn from this mistake. On the other hand, you did not want to embarrass the doctor.

The situation not only points out the importance of decision making and the consequences of inadequate medical skills, but also involves interpersonal relationships, an important concept in the Chinese society. After all, the Chinese society is an acquaintance society in which Guanxi plays a key role. Guanxi describes a system of implicit mutual obligations used to cultivate long-term, influential connections. Therefore, interpersonal relationships with colleagues and supervisors remain an critical part in any careers and it is worth pointing out in the scenarios.

2.1.4 Service Attitudes

When a tension is driven by service attitudes, patients are unsatisfied with the service they received during treatment. Criticisms most often entail an unfriendly verbal attitude, lack of effective communication with the patient, and lack of explanations for their illnesses [60].

Just as indicated in the example at the beginning, the doctor could have asked Li’s personal medical history and thereby figured out that he had tuberculosis, saving

him the trouble of hobbling to another clinic. Had they considered Li's poor family situation and the effort he had made to get to Harbin, they would have reviewed his medical records more carefully before making such a hasty decision. Knowing that his effort was in vain, Li felt insulted and later told his lawyer that his mindset at that time was "Are the doctors kidding me?" Although Li's extreme actions were certainly not condoned, this case taught the doctors that sufficient humanistic care and empathy for patients are fundamental to a healthy doctor-patient relationship.

I also incorporated this theme into my game, in which your (the player's) mother complains that her dentist is impatient when answering her questions and that she does not trust anything her dentist told her. However, when you take the time to answer her questions and clear up her confusion, even though she does not seem to understand, she is satisfied because she feels she has been treated with sufficient care and enough respect.

2.1.5 Medical Expenses

Expense-driven tension is created when doctor and patient disagree on medical costs. There are two possible reasons: First, the costs have exceeded the patient's budget so that he or she cannot afford it or second, the high prices have exceeded the patient's expectations. Thus, the patient becomes skeptical of the fees and thinks the hospital has overcharged in order to make profit. According to data from the Ministry of Health [9], the medical expenses for staying in the hospital once is close to one third of the annual income of an urban resident or a farmer's annual net income.

High medical expenses remain a crucial reason doctor-patient disputes. People complain that they "cannot afford to get sick" [60], and in some cases, it is not surprising that they repudiate a debt. This type of tension is reflected in one of my scenarios, in which the doctor has to choose whether to offer help for a patient who was laid off and cannot afford surgery. When given a chance to play the doctor and face similar situations, would you be willing to offer help to the poor? Being able to adopt different perspectives is a pivotal theme in my game and could be applied to many types of tension listed here.

2.1.6 Treatment Length

This type of tension refers to the complaints or antagonism toward medical staff regarding the length of treatment [60]. This usually occurs when the patient feels the value of the treatment time does not match the arduous waiting time. It can be hours or even days from the time one lines up to make an initial appointment until one is finally called in. However, the time that the doctor takes to diagnose the patient is usually extremely short compared with the waiting time, and many patients do not get the chance to ask questions before they are told to leave.

In one of my scenarios, when making a decision, I emphasize the fact that a lot of patients have been waiting outside your (the player's) office. Based on the results from the user testing, this information impacted how people made their decisions. The tension related to treatment length requires understanding and cooperation from both sides—patients have legitimate gripes when they have been cursorily treated, and doctors have to prioritize certain cases. My game shows both sides to players so that they see the situations from a more comprehensive lens.

2.1.7 Medical Bribery

The creation of this type of tension involves medical staff receiving bribes from drug manufacturers, medical device suppliers, and patients [60]. This tension includes two kinds of relationships, namely doctor–business and doctor–patient. Businesses bribe doctors to ensure that the hospital buys devices from their company. Patients are told to use these expensive machines, which could be replaced by inexpensive medicine. However, the consequences will eventually come down to the patients who use poor-quality devices. In the doctor–patient relationship, bribery (usually in the form of a red envelope¹) is given to the doctor before an operation in hope of a better performance.

This phenomenon is also highlighted in my scenario where the family member

¹In China, a red envelope or red packet refers to the money wrapped in a red envelope. It is given as a gift in special or meaningful occasions such as a New Year celebration or a wedding. Sometimes, patients or their family members give a red envelope to their attending physicians before a major operation in hope of a better performance.

gives the medical staff money to urge them to save his baby at all costs. However, this behavior reveals distrust toward the doctor, as you are using money to establish a temporary, contractual relationship. It is not conducive to a healthy, sustainable doctor–patient relationship, as it increases the burden on both sides.

Medical bribery relates to the issue of ethics, which has been highly valued in the development of medicine. Traditional Chinese medicine emphasizes ethics. It advocates dedication and humaneness, epitomized in Confucianism, which highlights benevolence—that is, equal care to every individual and wholehearted devotion to saving lives [45]. Although the influence of Confucianism has waned since the twentieth century [37], ethics remains an important issue in contemporary society. Some people attribute the doctor–patient tension to bad ethics of doctors. Accordingly, ethics play a key role in my game, where I create scenarios that involve ethical dilemma.

2.2 The Role of the Media

As is seen from above, several factors contributed to the tension in the doctor–patient relationship. Although systematic and governmental factors remain the central culprit, the media also plays a vital role in this ever-increasing doctor–patient rift [27]. Gaye Tuchman [46] makes an interesting analogy that the media today is parallel to the people who went round streets to spread news in older times. Both function to tell us what we “want to know, need to know, and should know” [46]. However, according to Bernard Cohen [14], the news that people consume is by no means just a “purveyor of information and opinion” [14]. The media is particularly successful in telling its audience what to think about. In consequence, the “mediated reality” we see from the media ultimately influences how we make sense of the doctor–patient tension.

Most people rely on the media to keep abreast of the latest news on healthcare and to form their perception of the current state of the doctor–patient relationship. Therefore, how people are influenced and directed by the media is critical to maintain a healthy doctor–patient relationship. Research shows that the news media extensively

used terms like “doctor–patient relationship tension” and “medical ethics landslide” in their reports [56]. The media is a powerful tool that influences public opinion, but it does not see to provide effective solutions in face of the doctor–patient relationship.

In this section, I narrow my focus from the broad societal problems in the doctor–patient relationship to the media treatment of those problems. Relevant theories are examined to provide theoretical frameworks that will be used to back up the examples raised. Then I summarize the problems associated with the media in dealing with the doctor–patient relationship.

2.2.1 Media Frames

Media frames present “a central organizing idea or story line that provides meaning to an unfolding strip of events, weaving a connection among them” [47]. Media frames could impact the quality of public information people receive and how they perceive the world. They suggest how issues should be thought about, creating a sensible narrative that conforms to established habits of minds [47]. Notably, Iyengar [35] identified episodic and thematic news frames as two levels that the media could utilize to formulate a news story about social problems. An *episodic frame* depicts issues in terms of personalized and concrete cases or events, whereas a *thematic frame* approaches issues from a generalized and abstract perspective [35]. Due to the visually salient and dramatic nature of episodic frame, news biases are invariably embedded within this type of news frame.

2.2.2 Media Biases

Lance Bennett [13] mentions four types of information biases in news media: Personalization, dramatization, fragmentation, and the authority-disorder bias. *Personalization* focuses events on an individual level and refers to the media preference for personalized human-interest news that blocks people from seeing the larger institutional, social or political picture. *Dramatization* emphasizes “crisis over continuity, the present over the past or future, and the personalities at their center” [13]. It pays

special attention to the dramatic part of the story instead of the broader context, and it fits neatly with the personalization bias. *Fragmentation* can be defined as the isolation of stories from each other and from their larger contexts so that information in the news becomes fragmented and difficult to assemble into a big picture [13]. The authority-disorder bias is the preoccupation with order, along with related questions of whether authorities are capable of establishing or restoring order.

2.2.3 Hard News vs. Soft News

Narrative constitutes the foundation for news reporting in which the reporters negotiate with the reader as to what is happening in the world [51]. News media's tendency to emphasize human-centered stories with sensational titles while leaving the systematic problems behind could be attributed to people's preference for soft news over hard news. According to Reinemann et al., *hard news* refers to news events that are "presumably important to citizens' ability to understand and respond to the world of public affairs" [42]. This type of news focuses on broader context and is more likely to emphasize facts and systematic problems of a specific issue or event.

In contrast, *soft news* is "more personality-centered" and has become "more personal and familiar" [42]. It is more sensational, with a focus on human trials. Markus Prior [41] shows that some people who would otherwise not watch any news at all pay attention to soft news coverage of crises and wars, because soft news offers people an alternative that maximizes their utility by combining entertainment and information. However, some people do not watch hard news programs because the opportunity costs from forfeiting payoffs from entertainment are too high [41]. Hard news is less appealing in content itself in comparison with soft news, as it lacks entertaining elements and accessibility to emotions, which are typical features of soft news and explain why reporters tend to downplay the systematic problems behind phenomena [13].

2.2.4 Cursory Investigation and Inaccurate Report

Having laid the theoretical foundation, I present a summary of the problems associated with the media. Reporters sometimes rush to produce the news without thoroughly investigating a case. Other times they make false judgments due to lack of medical knowledge. Their inaccurate reports give a fragmented or twisted picture that harms the reputation of the hospital and doctors involved.

When reporting a doctor–patient incident that has news value, the news media tends to use episodic frame to approach it from a personalized way, demonstrating personalization and dramatization biases. It focuses on creating sensational titles and emphasizing crisis over continuity. On July 28, 2010, a national newspaper called *Southern Metropolis Daily* released a piece of news titled “Pregnant Woman’s Anus Stitched, Suspecting Lack of Red Envelope.” This report was reposted on television, the Internet and social media platforms with more appalling titles such as “Midwife Demands Red Envelope” and “Pregnant Lady’s Anus Was Sewn.” However, up to this point, no one knew the complete story or the broader context of this issue. This incident spread throughout the country, with the public criticizing the main character in the news, midwife Zhang Jirong, for his retaliation on a pregnant lady because of an inadequate red packet. The online diatribes caused great distress to Zhang Jirong, damaging his work and personal life.

In 2012, China Central Television did an investigation of this case and found that the pregnant woman’s anus was not sewn and that mid wife Zhang Jirong did only a minor surgery suturing hemorrhoids, rather than closing the anus [57]. However, this incident has done great harm to the reputation of the midwife and the hospital he represents. That the media did not verify the content and instead used seditious words in the titles severely impaired the image of the medical staff (and hospital).

2.2.5 Lack of Depth in Factual-Based News

For hard news that adopts a thematic frame, it depicts issues from a generalized and abstract perspective. However, news reports tend to report doctor–patient disputes

without exploring the reasons behind what has happened. For instance, high medical expenses already became one of the major reasons for unpleasant medical experiences. Based on an analysis on news reports related to the healthcare industry, only 9.4% of them are concerned with medical expenses [54]. Within this limited population, news articles were mainly about free treatment opportunities and reports of large expenses. Most of these articles remain at the level of reporting data, without explaining the composition of those medical expenses or the reasons the expenses have been soaring. News reports would have been better if they incorporated considerations such as the following: What new healthcare policies have been enacted? How did the medical cost evolve over time? Are doctors responsible for the high medical expenses? When the media fails to probe into what lies behind the surface, the public would does not learn the root cause of the problem.

2.2.6 Misleading Example Setting

Typical cases constitute a unique phenomenon in China. Scholars have examined the mobilization model which was applied in setting major agendas in Mao's era, and the fourth phase of the model involved "grasping typical cases and spreading the experience gained at selected units to the whole country" [49]. Typical cases could be negative or positive, and are generally used to convince the public that the agenda is necessary and superior. They have strong propagandistic aims and are utilized to reinforce the leadership position of the government.

In contrast with some local and metropolitan media that focus on problems in doctor-patient relationships, some large-scale mainstream media emphasize positive incidents. Positive example setting is a form of episodic frame that highlight personalized and concrete cases. For example, in reporting a female medical professor, *China Daily* [59] wrote that she studied hard in college in order to pay back the Communist Party, the people, and her country. In the concluding paragraph, the report said that the Party has made China more independent and prosperous, moving from an initial phase of weakness and poverty to increasing international collaborations, with

China's medical and health industries "welcoming the new spring."² Although broad context has been addressed, this piece of news still has the fragmentation bias because her own life experience was not accounted in a thorough manner. Furthermore, tying her personal achievements to the historical development of China seems somewhat far-fetched and contributes minimally to understanding the doctor's responsibilities.

Another example is found in a television drama. *Secretary of the Provincial Party Committee*, a television drama that aired in 2002, had the following plot: Before doing an operation on a leader, medical staff expressed to the secretary of the provincial party committee that they would do their best. However, he said to the medical staff, "No, you have to be 100% successful!" Eventually, with the salient effort of the doctors, the operation was successful. Such a storyline may create a false impression that if the leaders devote full attention to a patient, the operation will be successful. In reality, however, medicine is a risky profession, with unforeseeable factors involved in every operation. It would be better if a TV drama would convey this reality to the audience and try not to establish any misleading "positive examples" to demonstrate the potency of either side.

Due to historical factors, this type of example setting is invariably political in nature and could be considered typical Chinese behavior. The positive figures covered in this type of report are so perfect that they do not even feel real. The ultimate purpose of example setting is not necessarily to help facilitate the doctor-patient relationship, but rather to paint a positive picture of the government and reinforce the leadership position of the Communist Party. Therefore, when encountering positive examples such as these, people become immune or desensitized and no longer pay much attention to the content.

2.2.7 Relevance

As is shown, when reporting news regarding the doctor-patient relationship, news media tends to approach the issue from an episodic frame, focusing on human drama

²In Chinese, "welcoming the new spring" means embracing a fresh new start, usually with hope and optimism.

and pushing personalities to the forefront. Soft news as such is easily brimmed with biases, blocking the audience from exploring the broader context and socioeconomic factors. Using sensational titles and fragmented personal stories to appeal to the public, especially in the context of the doctor–patient relationship, could be devastating.

When seeing titles such as “Midwife Demands Red Envelope” and “Pregnant Lady’s Anus Was Sewn,” the majority of people would not give a second thought because their only source for getting health-related information is news media, and they tend to regard the media as the authority. Most news reporters do not get the opportunity to go through what has happened before they write the report, as they did not witness the whole story from the beginning to the end with their limited time. Sometimes the report is biased, because the reporter did not have a chance to hear both sides of the story.

My project is particularly valuable in this aspect, as it allows reporters to go through a complete case similar to that in the real life, and give them the opportunity to hear the voice from both sides. With that in mind, they are equipped with a more attentive and comprehensive lens when publishing news reports, and hence offer an unbiased version of the doctor–patient relationship to the public.

2.3 Literature Review on Narrative

This section provides a literature review on narrative in television dramas and games to examine the usage and the effect of narrative. The examples raised in the following subsections are intended to demonstrate the prevalence of narrative across different media forms, justify my purpose of narrative construction, and indicate the influence they exerted on my own narrative design. In particular, Visual Novel game is discussed and is recognized as an appropriate genre for my game. The usage of narrative in the context of health has also been examined to showcase the potential to construct a narrative-based game on a health-related matter. Overall, the goal of this section is to lay the foundation for utilizing narrative in my project and provide the rationale for using it a health-related setting.

2.3.1 Medical Television Dramas

This section is concerned with narrative in medical TV dramas and cites *The Vigorous Life* as an example, through which I comment on the aspects that are inspiring for my project while pointing out an area that needs further improvement—the tendency to deify doctors as if they never make mistakes.

In addition to news reports, there are other media channels that speak to the audience in a direct way. Television, as an integral part of our lives, shows the audience a world full of “places, people and roles” [29]. TV dramas, in particular, not only enrich people’s leisure time but also allow them to witness and experience the life they have never heard before. The appeal of medical dramas could be traced to the curiosity to see a profession that they are not familiar with, a general interest in life and death decision-making, and the desire for learning advanced medical technologies [28]. Medical dramas and films, as forms of medical narrative, largely influence the public’s perception toward medical workers. By watching how doctors perform an operation, how they interact with patients, what consequences a decision would lead to, the public gain familiarity with the hospital setting, difficult decision-making and the outcome associated with it, which is conducive to promoting a kind of “shared power” within a doctor-patient relationship [15].

Compared to medical dramas in the western society, medical dramas in China are still relatively young. Since the first Chinese medical drama went on the air in 1987, medical dramas have not proliferated, with only a handful of them leaving a deep impression on the audience [58]. Whenever a good one was released, it soon stirred up a heated discussion among the public. Among medical dramas of high quality stands a well-received series called “The Vigorous Life.” Aired in 2005, *The Vigorous Life* was praised as the Chinese version of ER, featuring seven fast-paced independent cases in each episode with at least three critical ones. The series centered on six medical workers with completely different characters, and how they fight against various kinds of struggles both in their lives and at work to bravely take on the responsibilities and practice the Hippocratic Oath. It highlights tension in a wide array of facets—doctor-

patient relationships, interpersonal relationships, family members, loved ones—and shows the audience how the tension is eased or how an agreement is reached in the end.

In one episode, the patient was the female protagonist's professor back in school who suffers from serious cardiac failure. The patient needs to be transferred to another building immediately due to some reason. The professor is well aware of his situation and insists that the protagonist is not to move him as he knows his life would not last long. However, the protagonist persuades her professor not to give up hope as she remembers it is him who taught her not to desert any patient when she started her first day in medical school. Their performances are very touching, and the tension presented here causes a real dilemma—both sides' arguments sound reasonable. In the end, the professor is moved by his student. He agrees to move to another place and promises to live his life with hope. As is seen, both choices are sensible and they give the audience a difficult time making a decision had they been in the doctor's shoes. The plot of this episode sheds light on how to create the type of tension in the doctor-patient interaction and how to construct the choices when it comes to decision making in my narrative.

As the name suggests, *The Vigorous Life* lives up to its name—it delivers a sense of hope and distills much positive energy to the audience. However, the drama is not without limitation. In the above scenario, if the patient strongly refused to move and insisted that he did not want any further operations, the doctor should have respected his decision instead of continued to persuade him. In addition, the characters are so courageous and infallible that many argue that they could not reflect reality. One critic comments that “it seems that all ethical doctors are gathering in one hospital [4].” On the market of Chinese medical dramas, there is a tendency to paint too positive a picture for the protagonists so that they seem flawless not only in their medical skills but also in their ethics. One important function of medical dramas is to portray the societal problems in reality, where doctors are not always perfect. It is pivotal to acknowledge that doctors are human beings who have emotions and could make mistakes, although they are often not expected to.

2.3.2 Visual Novel Games

Narrative has been used extensively in games as an integral part of game experience. A visual novel game is generally composed of narration with few interactions for the player. Since its inception in the early 1990s in Japan [19], the general gameplay has been similar to the popular adventure based games widely available on the market. However, a visual novel game involves less problem solving and interaction compared to an adventure game. In addition to requiring minimal action from the user, another important characteristic of visual novels is that they are often developed using animation style static images for storytelling. The third important feature of visual novels is the presence of branching narratives to allow different endings for the story.

A good example of visual novel games related to the medical industry is the *Trauma Center* (2005), a series of simulation/visual novel games where players take up the role a surgeon in a fictional hospital setting to save patients from fictional pathological conditions. Conversations between the characters and the player are displayed in static animation images. The main user interaction involves decision making and performing surgeries like doctors usually do. The interaction is minimal so as to avoid interruption of the flow of the story, which makes playing the game similar to going through a comic book. Although not graphically astonishing, the game works well for the context in delivering the story [7].

As a narration heavy game with branching, it is suitable for my project to take the form of a visual novel game. It suffices to demonstrate my concept without barriers and it is technically accessible. The format of visual novel games and the successful examples on the market provide a guideline for game design. In addition, using the static images during conversation is more feasible than creating continuous animation for the scope of an individual project .

2.3.3 Narrative Games and Health Applications

According to Hinyard and Kreuter, the predominant paradigm in health communication till a decade ago has been using statistical methods and analyses to impact

people for behavioral changes [34]. In recent years, health communication researchers have paid more attention to narrative forms such as storytelling and entertainment education to achieve the same goal [34]. Sociolinguist William Labov suggests that the oral narratives of personal experience are at the base of narratives in other media [36]. Narrative is regarded as the fundamental mode of human interaction that provides “a deep and satisfying sense of involvement” [32], and research has shown that the ability to enjoy narratives is universal [22].

Spent (2011), an interactive narrative-driven game [5] about surviving poverty and homelessness for Urban Ministries of Durham (UMD), aims to raise awareness for homelessness and the difficulties associated with low-income life. Two characteristics of its game design stand out: First, its apt use of pedagogic messages with the citation of credible sources (i.e. hyperlinks to research papers and news articles) enhances the authority of the game. Second, its timely psychological awakening of people’s empathy is effective. The game asks the player to donate money right after the player has lost the game, a point when they feel most desperate and probably most relatable to people who struggle with poverty. As a game reviewer commented, “I thought this was effective because this was the moment I felt most helpless when playing the game, and therefore most empathetic towards those who might face this situation in real-life, and therefore most likely to donate [6].” By putting oneself in the shoes of those struggling, these features not only help people engage in perspective taking but also trigger an empathetic feeling among the players.

Narrative has been shown to be promising in health-related applications. Bruner has proposed two ways of knowing: The paradigmatic and the narrative [17]. The paradigmatic is characterized by using procedures to validate the empirical truth, and is deemed a more scientific way of knowing. It utilizes “empirical and experimental methods to discover, describe or elucidate facts” concerning some area of interest [34]; On the other hand, the narrative way of knowing, which is a more of an emerging field a decade ago, is more inclined to put the human at the center of the story, including but not limited to: Personal experiences, gripping drama, fascinating stories, historical accounts and so on [34]. Schank and Berman suggest that the construction

of stories could inform and teach ourselves about what we know and what we think [44].

Perhaps most importantly, the reason that the narrative way of knowing is getting more popular in the health field is because of its unique ability to immerse the reader in the storytelling process by transporting them to another state of mind and changing their attitudes through their text journey [31] [38]. Immersion is regarded as “a phenomenological experience of the engagement with narratives” [38], through which people travel to the world of the story and experience changes in their attitudes, thoughts, and even behaviors sometimes. Story immersion emphasizes the value of a compelling story and a realistic environment [24].

Attempts have been made to bring narratives in health-related areas to influence people for better outcomes. One example is *Depression Quest* (2013) developed by Zoë Quinn [2]. It is an interactive fiction game in which you play as a young adult suffering from depression. The format is textual descriptions with hyperlinks, pictures relevant to the context as well as background music to create an immersive experience. As a player, you are presented with a series of daily events and need to manage an array of aspects in your life: illness, relationships, job, and possible treatment. By presenting the player “as real a simulation of depression as possible [2],” the goal of the game is to foster greater understanding and raise awareness toward depression for non-sufferers and let people who suffer from depression know that they are not alone.

2.3.4 Perspective Taking and Empathy

Perspective taking refers to the process by which an individual takes on an alternative point of view. Research on perspective taking has spanned a variety of fields, including, but not limited to, neuroscience, psychology, sociology, behavioral studies, social network and so on. For the scope of this study, I reviewed literature on perspective taking in the field of social psychology.

According to scholars, the technique of role-playing is an effective agent for attitudinal and behavioral changes. The process can be realized visually by switching one’s location to see the life of someone’s; it can also happen cognitively in which one

simulates someone else's cognitive state. Perspective taking could be seen as a temporary suspending of mind—one momentarily suspends his/her mind in an attempt to imagine others' situation [26]. As described by Ruby and Decety, perspective taking is an integral part in the mechanisms that explain “intersubjectivity and agency” [43].

To test the effect of perspective taking, controlled experiments have been done. For example, in Clore and Jeffery's experiment [21], participants were asked to travel around the campus in a wheel chair to experience being disabled for an hour. The experiment indicated that both direct and vicarious emotional role playing led to a more positive attitude not only to a specific disabled person but also to an array of issues surrounding this group of people. In Batson *et al.*'s experiment [12], participants were asked to watch the recount of a young woman with AIDS, and the findings suggested improved empathy for the woman and more positive attitude toward people with AIDS as a group. It is shown that contact (both direct and indirect) plays a critical role in enhancing intergroup attitudes by changing how people socially categorize others and how they perceive these categorizations [16] [25]. It can be seen that perspective taking is promising in facilitating positive attitudinal change not only to the representative individual involved but also to the group as a whole.

It is necessary to acknowledge that there are competing theories on perspective taking. Some scholars have casted doubts on whether perspective-taking would work in terms of ethnic conflict [11], and some studies already showed that perspective-taking sometimes had the opposite effect [48] [40]. In this thesis, I aligned with the theory that perspective taking could enable empathetic feelings and lead to a more positive attitude toward the whole group.

Psychologists [23] argued that adopting the perspective of another person perceived to be in need could evoke an affective response toward that person, which is more commonly known as empathy. However, the perspective taking process does not necessitate empathy. Meherabian and Epstein [39] argued that there was a critical difference between these two concepts: *Perspective taking* is a cognitive role-taking process, whereas *empathy* refers to empathetic emotional responsiveness. The former is the recognition of another person's feelings, whereas the latter often involves the

sharing of feelings [39], which usually takes time and is hard to cultivate during a short time. To this end, when creating my own project, I intend to treat it as a means for perspective taking rather than a tool for empathy building.

Furthermore, most studies on perspective giving have been concerned with letting people from an empowered or majority group take the perspective of a prejudiced or minority group. The present study, however, does not emphasize group parity but rather an alternative experience from a different point of view. The two groups of people, doctors and patients, do not differ in status or power. It is hoped that by vicarious emotional role playing, patients could show more understanding and tolerance toward doctors.

2.3.5 Present Work

The Vigorous Life serves as a great source of inspiration for my project as it not only situates me in and familiarizes me with the unique environment of the Chinese health system but also sheds light on how a tension is formed and appeased. According to Gauthier, medical series usually present decision making in stressful conditions so that viewers could be absorbed in those situations while at the same time remaining critical about the options selected and the potential consequences [28]. This is a great guideline for creating tension in my project because I need to ponder how to convey decision making in a dire situation and remind the viewer of the possible outcomes.

Reflecting on the common problems with medical dramas, my project will strive to combat the "deified and flawless doctor" as seen on medical TV dramas who not only ace in their careers but are also praised by their patients and colleagues. Instead, I intend to portray the doctor as a dimensional figure who lives life just as ordinary people and faces various challenges including: Work, family, interpersonal relationships and so on.

As recent years have witnessed successful attempts aiming to use narratives in health-related applications, narrative could be used as a feasible approach in the context of medicine, especially in the doctor-patient relationship. To my knowledge, thus far, no scholarship has examined the use of narrative in the doctor-patient

relationship in the context of China, as humanity medicine is still a relatively new concept there. This thesis is to close the gap by offering an attempt to use narrative as a constructive tool (and hopefully a remedy) in the ever-intensifying environment of the doctor–patient relationship. It is hoped that through compelling yet realistic narratives that put the audience in the doctor’s shoes, people will be engaged in the story, thereby increasing their identification and fostering greater awareness towards medical professionals.

Chapter 3

My Digital Project: Doctor Simulator

3.1 Project Overview

Doctor Simulator is a narrative-driven game aiming to promote perspective taking by situating the player in the hospital setting and allowing him or her to take on the role of an emergency room (ER) doctor. The player faces a series of dilemmas/difficult situations, as doctors usually do, and has to choose between two comparably tempting decisions. Each choice is associated with a particular consequence, after which players are given a self-reflective moment to ponder the decision they just made. The five scenarios are sequential and are designed to simulate real-life doctor-patient interaction, through which the player gets immersed in the scenarios and experiences a hectic day as an ER doctor.

By letting the audience take the perspective of the doctor and by exposing typical cases featuring doctor-patient tension in China, the game aims to increase awareness of what doctors do in their job routines and to foster greater understanding of medical professionals. Through realistic conversations and descriptions, the game serves its educational purpose by providing an interactive and fun experience rather than a didactic one. Through perspective taking, the game strives to help combat prejudice toward doctors as a profession and to help overcome the skewed image of doctors that many hold. In an environment where media intervention on the doctor-patient relationship is especially wanting, I expect that Doctor Simulator will guide the public

in formulating their perceptions toward doctors and act as a remedy to the ever-worsening doctor–patient relationship in China.

3.2 Design Process

3.2.1 Methods

1. Secondary Research

In order to to gain a deeper theoretical understanding of the subject and in order to construct doctor–patient scenarios in my game, I thoroughly reviewed scholarly articles on China National Knowledge Infrastructure (CNKI)—one of the most authoritative databases in China for academic resources—for literature on the doctor-patient relationship, narrative medicine and bedside manner. Then I did a extensive online research regarding news and personal stories from the past five years that involved the doctor–patient relationship. I scrutinized cases of doctor–patient interaction across a range of media, including mainstream news outlets, microblogging websites, blogs, question-and-answer platforms, social networking sites, WeChat public accounts, books, and television medical dramas. Then I collected and organized the ones that were pertinent to this project’s scope of work. After exhaustively examining these doctor–patient cases, I formed a clear sense of some of the most recurring themes of doctor–patient tension (which I elaborated on in section 3.3). While delving into specific themes and designing the storyline, I interviewed physicians to ensure accurate use of medical knowledge.

2. Qualitative Interviews

Because the game is concerned with the doctor–patient relationship, understanding basic medical knowledge is key to constructing realistic interaction. For example, I would not be able to write a logical doctor–patient scenario had I not known the diagnostic process of a particular illness. This type of factual knowledge could only be verified by medical authorities. Furthermore,

doctors encounter various types of patients. There is no better way to know doctor–patient stories than by asking doctors directly. To this end, I contacted the nine doctors I know and scheduled in-depth interviews with five of them in order to consult on doctor–patient interaction and verify the development of specific plots in the game. The interview consisted of two parts. The first part involved general questions about the logistics of seeing a patient. The second part delved into specifics about particular diseases and their respective diagnostic processes. The interview questions can be seen in Appendix A.

3. User Testing

The game has gone through a few design iterations. After each iteration, user testing was conducted to gather feedback. A total of 20 participants were interviewed, with each test lasting 1–2 hours. The test consisted of three phases:

- **PHASE I:** Interview participants about their impression of the doctor–patient tension in China and interventions for alleviating the situation.
- **PHASE II:** Instruct participants to play the game, observe their actions, record their choices, and write down what they say.
- **PHASE III:** Interview participants about their feedback on the game; ask for their evaluations and suggestions.

During the user testing, I adopted a method called participant-observation along with semi-structured interview for a preliminary exploration of the user’s impression of the game, as well as of the doctor–patient relationship. Before starting I clarified that I wanted to observe their actions while playing the game and take note of their choices and reactions. I encouraged participants to play out loud—they were encouraged to speak their thought processes and thoughts that came to their minds as they made decisions. They could tell me their intuitions as well as their intellectual rationales for selecting a particular option and could inform me whether the logic of the story made sense to them. In recording the feedback, I took notes in three levels: First, I promptly took substantive

notes, entailing careful descriptions of what I saw and heard. Secondly, I took logistical notes that contained context and information about the circumstances encountered. Finally, I took reflexive notes of my thoughts and feelings about user experiences and things I needed to work on.

3.2.2 First Iteration

When I first started creating the story plots, I wanted players to experience a coherent narrative in the hospital setting. My plan was to construct three narratives for three different departments (gastroenterology, respiratory, and general surgery) so that the player could choose at the start which department they will play. I started with the gastroenterology department and let players imagine themselves being a second-line doctor in that department. As seen in Figure 3-1¹, the first iteration is a rough prototype just for demonstrating the concept. The player was set to be a single, thirtyish doctor on duty for a 24-hour nonstop shift, despite the fact that it is the eve of Spring Festival, when families get together.

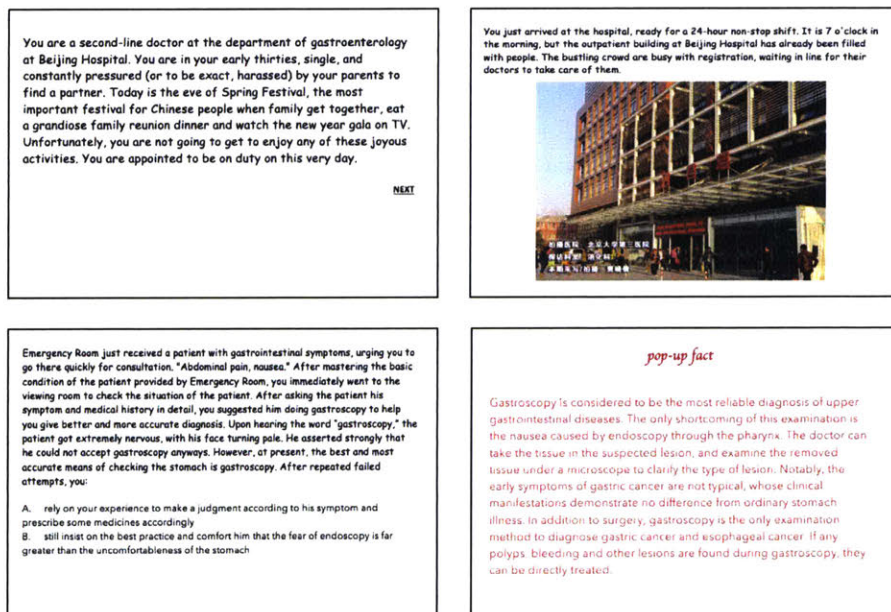


Figure 3-1: Four screenshots of the first iteration

¹The picture is from <http://puh3.net.cn/mtsy/mtjj/77329.shtml>

In terms of the options, I limited them to two for each circumstance, even though there are more than two choices in real life. However, a limit of two choices added to the urgency while at the same time reflecting the dilemma that doctors usually face. Medical terminology was also incorporated to enhance clarity. The cases that I intended to develop needed to have the following characteristics:

1. **Typical:** They constitute such representative problems in the doctor–patient relationship that many people could resonate with the situation.
2. **Realistic:** Most of the stories in the game were grounded in real-life experiences, either from my interviews with physicians or from online news and personal blogs.
3. **Dimensional:** The narrative was not intended to sing an ode to doctors and portray them as saints who never make mistakes. Instead, it sought to “humanize” doctors by creating scenarios where doctors had personal issues to take care of and they could indeed make mistakes.

The story was not designed to be monotonous; it encompassed various elements and allowed multiple interpretations. Tension, urgency, and ethics were all at play, and the player was compelled to make a decision even though neither option seemed acceptable. There was no right or wrong answer.

As the creation proceeded, I found it particularly challenging to gather enough examples of the cases I desired in a particular department. For instance, only a few doctor–patient cases in the gastroenterology department could be found online. Finding one that could be developed into a story and that satisfied my selection criteria was even more difficult. Running out of inspiration for creating the narrative, I showed my work-in-progress to five people—my advisor, two game lovers, and two classmates—for preliminary user testing.

Almost all of them thought that developing stories within a particular department was monotonous. The cases lacked diversity, and the narrative needed to incorporate more urgency, tension, and drama to make it fun to navigate through. The pop-up

fact window, which was supposed to demystify misconceptions and educate the player of basic medical knowledge, turned out to be too didactic, and it interrupted the flow of the narrative. In addition, a few users did not feel comfortable about a very specific character setting. According to their feedback, it was good that the character was gender neutral, but additional character development (e.g., “You are in your early thirties, single, and constantly pressured by your parents to find a partner”) would probably make some users uncomfortable. Furthermore, some of them suggested that it would be better to go straight into the point and get rid of unnecessary details. For example, although the opening paragraph tried to establish the context, the description seemed to have little to do with the real start of the game. Also, another useful suggestion was that I should make the two options equally tempting—there should not be an obvious right or wrong answer.

Based on their suggestions, I made changes to the game. First, I cut to the chase by starting with a concise and general one-sentence description about the character. Second, I shut down the “pop-up fact window.” Additionally, I forfeited the idea that all scenarios happened within a particular department. I had to rethink where the stories took place and added more twists and turns in the narrative to make the experience more engaging and playful. Finally, I spent more time constructing the options and making them seem equally viable.

3.2.3 Second Iteration

Having taken the users’ feedback into consideration, I began my second iteration. I decided that the stories would take place in the emergency room (ER) because it is always hectic and fast-tempo and could nicely mingle other departments together. In this way, the doctor–patient cases became more diversified without the constraints in a certain department. Instead of a meandering opening paragraph, I started the narrative with a concise and general statement: “You are a young doctor working in the emergency room (ER) for three years.” There were more examples from the Internet and TV dramas that could serve as sources of inspiration. Based on news, TV drama, and stories from the physicians I interviewed, I designed a ten-scenario

narrative simulating a hectic day of an ER doctor (Figure 3-2 to Figure 3-6).

1. You are a young doctor working in the emergency room (ER) for three years.



It was a usual Friday. You had been exhausted from a week's toil and had to stay up late to treat patients. In the morning, when you just arrived at the hospital, the head of your department called you in. He informed you that he had just received a patient complaining about your treatment of a wound—that wound later developed an infection with a high fever. The patient insisted that it was your fault, but you felt that you followed the standard protocol and the infection was an uncontrollable misfortune. At this moment, many patients were waiting outside your office and your supervisor demanded an immediate solution to this complaint. You would:

- Insist no fault on your part and spend half an hour to file a comprehensive report explaining your practice
- Take the fall, apologize to appease the patient and let the incident pass so that you could return to other patients

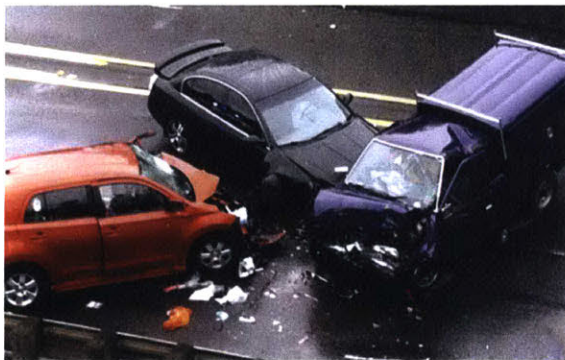
2. After returning to the ER, the first patient you saw was a woman with appendicitis. Normally, a standard surgical removal of the appendix could easily fix it. However, the case was special for this patient as she had been pregnant for 7 months. In this situation, any stimulus to the womb during the surgery could harm the fetus. But foregoing or postponing the surgery could cause significant pain to the patient and increase the risk of further infection or even death. On top of the medical complexity, the patient's husband was very agitated and urged you to save the baby at all costs. The couple went through great ordeal to get pregnant and the wife might not be able to conceive again. What would you do? You would:



- Convince the family that it is in the patient's best interests to choose surgery and take the risk to perform the surgery yourself
- Prescribe medicine to the woman to stabilize her condition and suggest transferring her to another hospital for further consultation and treatment

Figure 3-2: Scenario 1 and Scenario 2

3. While you were busy treating the pregnant woman, your colleagues were working with several patients from a car accident where three cars collided. You noticed that one of the severely injured patients happened to be the father of Ming, a close friend of yours working in the same department. You wanted to tell him immediately what had happened, but you were told that he was performing a major operation, which would probably last no less than six hours. What would you do? You would:



- Inform your colleague Ming immediately so that he can take care of his father
- Not disturb your colleague Ming and ask a nurse to keep an eye on his father for him

4. As the day got hectic, your mother called and told you that she was not feeling well today. She said she had a fever and needed someone to take care of her. Your father was far away on a business trip. She complained that she hadn't seen you for quite a while and she wanted you—her only child—to come home more often. However, you were preoccupied with work and couldn't take time off. What would you do? You would:



- Tell her that you were tied up at work and instruct her to take proper medication
- Ask your colleague to cover for you and go back home to look after your mother

Figure 3-3: Scenario 3 and Scenario 4

5. After you settled your personal matter, a teenage girl arrived at the hospital with her father. Two weeks ago, she was diagnosed with a common leg injury. However, after examination, you found that she actually had deep vein thrombus, which could potentially lead to death. This misdiagnosis was not unheard of and could serve as a great case study for the whole department. You wanted your colleagues to learn from this mistake; on the other hand, many coworkers knew that it was Ming who treated this little girl. You were concerned that holding a public discussion would not only hurt his feelings but also damage his professional reputation. Taking all into account, you decided to:



- Organize a public case discussion to examine the underlying causes for such mistakes and warn the doctors against future occurrences of misdiagnosis
- Have a one-on-one discussion with Ming about the case, remind him to exert more caution, and encourage him to report this incident to the director privately

6. After taking care of the girl, a man hobbled into the emergency with a painful look. He said he just sprained his ankle and needed a simple 'patch up'. You ordered an X-ray that confirmed his multiple ankle fractures. Based on this result, you recommended immediate ankle surgery as this was the optimal treatment plan. He refused to look at the X-ray and insisted that it was impossible for him to have any fractures and you were overtreating him to make a profit. You tried to talk sense into him and informed him that if he agreed to surgery, which he should, he needed to provide ¥10k as deposit. He said he was just laid off and could by no means afford that surgery. You warned him, without surgery, he might never walk normally again. But he said he'd rather be limp for the rest of his life than be broke. Facing such a difficult patient, what would you do? You would:



- Insist on surgery for the patient's best interest. Refer him to another colleague if he fails to cooperate
- Respect the patient's decision and offer alternative suboptimal plans, such as wearing a cast

Figure 3-4: Scenario 5 and Scenario 6

7. When you wanted to take a short break, your uncle texted you saying "my tooth fell!" You were appalled and asked him to take a picture. It turned out to be the dropping of temporary tooth filling. Your uncle questioned his dentist's professionalism and suspected the dentist of overcharging him for his root canal treatment. You said that the price was fair and your hospital charged about the same. However, he remained skeptical and even suspected that the dentist filled out another tooth of his without his consent. After seeing the screenshot of his medical record, you were convinced that the dentist did nothing wrong. Although you explained at your wit's end, he still didn't believe the dentist. What would you do? You would:



- Emphasize that cooperation and trust are essential in medical treatment, and that he will recover faster if he learns to trust the dentist and follows his/her instructions
- Tell him that he is exactly the kind of patients that you are most afraid of, because they don't trust doctors from the very beginning, and suspect everything the doctors do

8. Your short break didn't last long. Emergency room just received a patient with abdominal pain and nausea. After inquiring more about his symptoms and examining his medical history, you recommended gastroscopy—the best and most accurate means of checking the stomach—to help ensure an accurate diagnosis. Upon hearing the word "gastroscopy," the patient flatly declined because he was afraid of the procedure. Although you assured the patient that the fear of gastroscopy was far greater than the actual stomach discomfort, he was still uncooperative. After repeated failed attempts, what would you do? You would:



- Prescribe medicine to temporarily alleviate his symptoms, encourage him to have gastroscopy whenever he is ready and remind him of the risk of delayed treatment
- Insist on the best practice and help him overcome his irrational fear of gastroscopy by talking him through the procedure at the expense of your valuable time

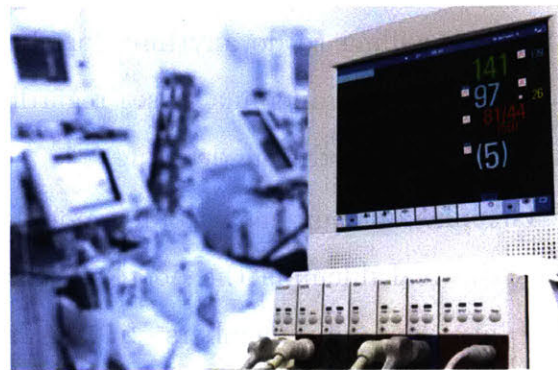
Figure 3-5: Scenario 7 and Scenario 8

9. After the gastroscopy case, you encountered a high school student with a seriously swollen tonsil. He told you he had been feeling great pain in his tonsil recently and had trouble swallowing anything, even saliva. He wished for the pain to go away as soon as possible so that he could prepare for and attend the National College Entrance Exam next week. You have a cousin who was also going to take the exam so you could relate to his desperate situation. You knew antibiotics would be the most effective medicine under this circumstance, but your department had already exceeded its monthly limit of antibiotics prescription. If you break the rule, you might leave a negative impression on your director or even face financial penalty. What would you do? You would:



Decline to prescribe antibiotics and tell him one should limit his use of antibiotics given their potential for drug tolerance
 Prescribe antibiotics for him, explain the situation to your director and ask for his understanding

10. At the end of a busy day, you sat down at dinner table and felt that you could finally relax. However, a construction worker accidentally cut off the power on one floor in the hospital where the intensive care unit (ICU) is located. It would take at least a day to repair and get the power back on. As an ER doctor, you were called to help transfer those patients there immediately. One of the patients has serious cardiac disease and his life wouldn't last long. It would be very risky to move him around, and even the tiniest bump on the way could be fatal. But leaving the patient there without power would also be very dangerous, as there will be no power for the cardiac defibrillating machine in case of a cardiac failure. What would you do? You would:



Keep the patient in the ICU and ask a nurse to stay and keep an eye on him and call you in case of emergencies
 Take the risk to move the patient to another room with power

Figure 3-6: Scenario 9 and Scenario 10

Each scenario involved a dilemma in which the player had to consider various factors and needed to sacrifice something to reach a decision. For example, the second scenario was about a woman with appendicitis. Normally, a standard surgical removal of the appendix could easily fix it. However, this patient was seven months pregnant, so any stimulus to the womb during the surgery could harm the fetus. But postponing the surgery would leave the patient in pain and increase the risk of further infection and death. On top of the medical complexity, the patient's husband was agitated and urged you (the player) to save the baby at all costs. The wife went through a great ordeal to get pregnant and might not be able to conceive again. The player was asked to make a critical decision regarding whether to do the surgery. I acknowledge that it is hard to clarify all of the factors associated with the patient and that it may depend on whether the player has the necessary medical knowledge to make an informed decision. I strived to make the situation clear enough and each choice justifiable.

This case pointed out a typical social phenomenon in China—the Little Emperor. Children born during the era of the One Child Policy, dubbed “Little Emperors,”

grow up as the sole focus of their parents' and grandparents' attention. Since the family could have only one child, the child is given much love and expectation from the beginning and is regarded as the "apple of their eyes." For some parents, they are more than willing to do anything for the child because he or she means the world to them. When a dilemma arises regarding whether to save the adult or the baby, families have a hard time deciding.

This phenomenon has become a popular theme in TV medical dramas, as it highlights the real dilemma the doctor is confronted with and the difficulty of talking sense into the family members. In real life, some doctors are threatened with being taken to court unless they keep both the baby and the adult alive. In other extreme circumstances, irrational family members tell the doctors that they will commit suicide if the baby was not saved. If you were in the doctor's shoes, how would you deal with irrational family members who insist on saving the baby? This scenario gives the player a chance to contemplate on this thorny issue.

A total of 15 people have done the user testing for this design iteration. By tracking and recording their mental processes, I was able to understand their rationales for selecting a specific option and to understand whether the plot made sense to them. I marked the place where they got stuck and revised the logic to make it clearer.

During the user testing, a plethora of suggestions were received. They were very helpful for improving my narrative design. Upon reflecting on the feedback, I figured out three main aspects to further refine for the next iteration: **language use**, **user experience** and **game mechanics**.

First, there were language concerns regarding the use of certain phrases. For example, a participant raised a practical language concern that I failed to pay attention to. "You seem to use the phrase 'deal with patients' often. It seems to me that this phrase carries a negative connotation. For example, patients are burdens to doctors. Unless that's what you intend to show, consider using 'treat/see patients' to maintain a more neutral tone." I found this extremely helpful because I did not intend to bring subjective judgment or implicit prejudice into the narrative.

Another concern was about the generalized use of vague language. In one scenario,

the player had to decide whether to perform a surgery for a poor man who had two fractures in his ankle and could not afford the fees. In one of the options, I wrote, “Do your best to persuade him to doing the surgery, and if he really lacks the money, you are willing to help him pull through.” The participant did not understand how exactly the doctor could help the patient pull through. She commented, “You could pay the medical bill for the patient yourself. You could bring the case to your director and ask the department to cover the cost of surgery. You could contact NGOs and philanthropic foundations to help the patient fund his surgery. You could also ask other healthcare professionals for donations and together pay the bill.”

Had I not done the user test, it would never have occurred to me that a simple phrase would cause such confusion. Sometimes I used a phrase or idiom without a second thought because it could easily encapsulate what I wanted to convey. However, in narrative design, one needs to be mindful about word choices and should not use a phrase for the sake of convenience. As there were many possibilities associated with the phrase “help someone pull through,” I should make it clear by specifying a certain course of action, instead of leaving it vague and open to multiple interpretations. In the next iteration (shown section 3.3), I have scrutinized the narrative script again to check for vague language. In particular, I made sure to use specific and technical terms for clarity when necessary.

Secondly, most participants raised concerns about the readability of the script. The participants recruited for my user testing had a high education level; they were pursuing or had received a college degree in the United States. Thus, they were fluent in English and had no trouble understanding my script. However, people of older generations and with relatively lower educational levels constitute the majority of the population that frequents hospitals and uses the healthcare system in China. Many of them have a low level of literacy in Chinese, let alone English. Thus, creating a Chinese version of the narrative was a must.

Furthermore, several users mentioned that the current script was too text-heavy and that some sentences were too long to follow. Accordingly, I broke sentences down and improved their clarity. Also, the content of the narrative was largely descriptive,

so they felt that the scenarios were less interactive but more in the format of a questionnaire. However, half the participants expressed a positive attitude toward the pictures added to the scenarios, saying that the pictures were relevant and that they enhanced the overall experience. Pure text would fatigue players and decrease their interest in continuing the game. Visual aids sparked interest and improved the game experience. I realized that adding visual and perhaps even audio elements made a difference, and I took advantage of these features in my next iteration.

To add more fun to the game, some participants suggested that it would be better if the story could be demonstrated in a more interactive format. Instead of providing a descriptive summary for each scenario, I could turn it into a dialogue and create characters who interact with one another. In this way, players would gain a more interesting and memorable experience while navigating through the game. They could follow the story more easily with a more straightforward experience of taking the perspective of the doctor.

In addition, some users suggested working more on the game mechanics. One user pointed out that the game is ultimately about mastery—at the end of the game, the audience should feel that they have mastered something, but that feeling is lacking in my project. In the current version, all ten scenarios work independently, and there appeared to be no mounting consequence for each option that the player selected. For example, in the first scenario, if the player chooses A, what should be the associated consequence? What if the player chooses B instead? If a consequence could be attached to each option, players would get a clearer sense of what consequences their choice would entail, and that would better serve the game’s purpose of educating the public about what decision-making means for medical professionals.

3.3 Final Version

For the final iteration, I incorporated the feedback from user testing and rewrote the narrative in the dialogue format. Specifically, I used the descriptive summary of each scenario as the baseline and expanded it with dialogue-based interaction. For

example, in the first scenario, the original text was:

You are a young doctor working in the emergency room (ER) for three years. It was a usual Friday. You had been exhausted from a week's toil and had to stay up late to treat patients. In the morning, when you just arrived at the hospital, the head of your department called you in. He informed you that he had just received a patient complaining about your treatment of a wound—that wound later developed an infection with a high fever. The patient insisted that it was your fault, but you felt that you followed the standard protocol and the infection was an uncontrollable misfortune. At this moment, many patients were waiting outside your office and your supervisor demanded an immediate solution to this complaint. You would:

Using this as the groundwork, I added more detail to make it more vivid and relatable, meanwhile establishing the characters by involving dialogues. The English version was translated as accurately as possible; when I encountered phrases or idioms that could not be translated literally, I also strived to restore the original meaning. Here is an excerpt of the first scene of the script:

When you just arrived at the hospital, you received a call from the department head—Director Wang.

Director Wang: *(very seriously) I have just received a patient complaint. The patient's name is Zhao Wei. He said you treated a wound on his hand a week ago. Is it true?*

You: *(think for a second) Yes, I recall that. What happened?*

Director Wang: *The patient complained that the wound was not properly handled, which then led to a wound infection with a high fever. Can you recall anything wrong with your treatment?*

You: (thinking hard) Well, it was a small wound that didn't need stitches. I followed the standard protocol of treating wounds, and bound up the wound after careful cleaning. Just in case, I prescribed him some ointment and antibiotics. There was no mistake in the whole process, and as for his infection, I can only say it was an uncontrollable misfortune.

Director Wang: Be it controllable or not, our primary concern is the complaint. How do you want to deal with it?

You: When he didn't feel well, his immediate reaction was not to see the doctor, but to file a complaint. How could it solve the problem? (a bit annoyed) Do I need to give a solution now?

Director Wang: Yeah. He is in my office demanding a solution. Please come over now.

You: Alright, I'll be there soon.

A 32-page script (in both Chinese and English) was written. Considering the proper length for the project, I cut off five scenarios from the previous version and focused on the other five more well-received scenarios. In addition to the aforementioned first scenario, here are the other four scenarios that I chose to expand:

- *After returning to the ER, the first patient you saw was a woman with appendicitis. Normally, a standard surgical removal of the appendix could easily fix it. However, the case was special for this patient, as she was seven months pregnant. In this situation, any stimulus to the womb during the surgery could harm the fetus. But foregoing or postponing the surgery could cause pain and increase the risk of further infection or even death. On top of the medical complexity, the patient's husband was agitated and urged you to save the baby at all costs. The couple went through great ordeal to get pregnant, and the wife might not be able to conceive again. What would you do?*

- *A teenage girl arrived at the hospital with her father. Two weeks ago, she was diagnosed with a common leg injury. However, after examination, you found that she actually had deep vein thrombus, which could potentially lead to death. This misdiagnosis was not unheard of and could serve as a great case study for the whole department. You wanted your colleagues to learn from this mistake; on the other hand, many coworkers knew that it was Ming who treated this little girl. You were concerned that holding a public discussion would not only hurt his feelings but also damage his professional reputation. Taking all into account, you decided to:*
- *When you wanted to take a short break, your mother texted you saying "my tooth fell out!" You were appalled and asked her to take a picture. It turned out to be the dropping of a temporary tooth filling. Your mother questioned her dentist's professionalism and suspected the dentist of overcharging her for her root canal. You said that the price was fair and your hospital charged about the same. However, she remained skeptical and even suspected that the dentist, without her consent, pulled out another tooth. After seeing the screenshot of her medical record, you were convinced that the dentist did nothing wrong. Although you explained to your wit's end, she still didn't believe the dentist. What would you do?*
- *Your short break didn't last long. The emergency room just received a patient with abdominal pain and nausea. After inquiring about his symptoms and examining his medical history, you recommended gastroscopy—the best and most accurate means of checking the stomach—to help ensure an accurate diagnosis. Upon hearing the word "gastroscopy," the patient flatly declined because he was afraid of the procedure. Although you assured the patient that the fear of gastroscopy was far greater than the actual stomach discomfort, he was still uncooperative. After repeated failed attempts, what would you do?*

To visualize the narrative and make it into a playable format, I hosted my project on a game engine called 66rpg, using their software Orange Light—a game production tool that allows the producer to use text, music, pictures and options to obtain different experiences of their works. I created two versions of the game—one in Chinese and one in English. Despite the language, the two versions are identical. The Chinese version is for my intended audience, whereas the English version is for the purpose of demonstration for a broader audience. The game is composed of narration and dialogues between characters. The user interface (UI) was designed in gray to fit the theme of the hospital. When there is a dialogue, the character’s figure and line will pop up in the gray box located at the bottom of the screen. The screenshots of the game (English version) are shown from Figure 3-7 to Figure 3-15.



Figure 3-7: The English cover of Doctor Simulator

The game starts off with a narration, which sets up the context and indicates the nature of your work. The player is set to be gender neutral and instantly brought into the mindset of an ER doctor. Then a close-up of your bedroom is shown.

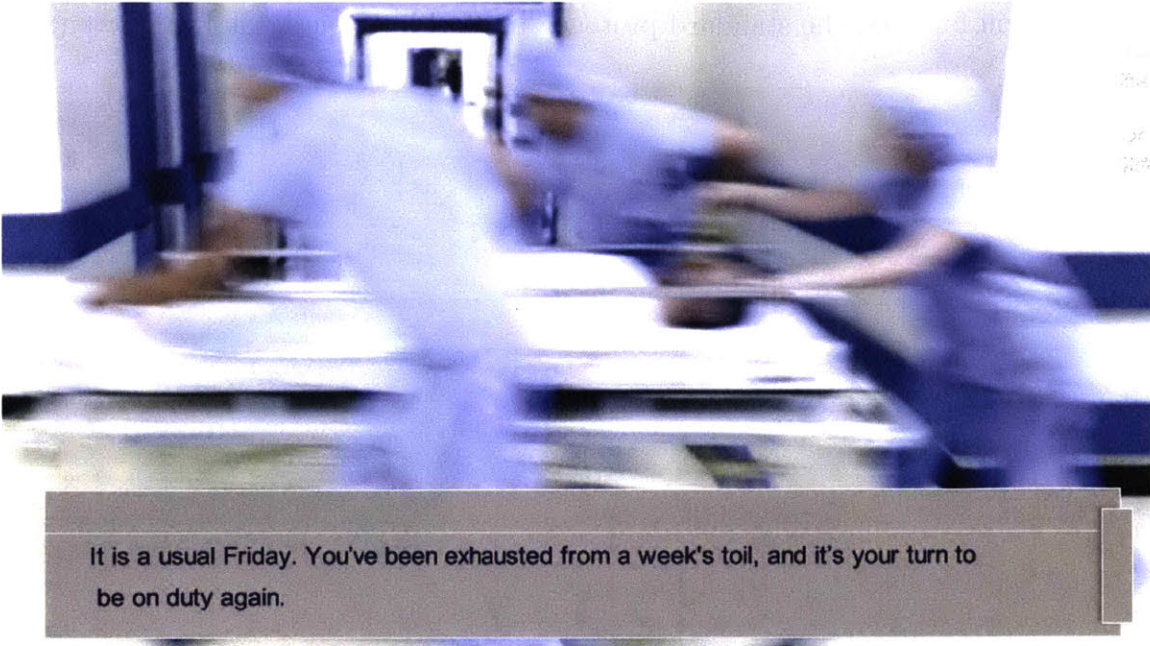


Figure 3-8: The opening narration part 1

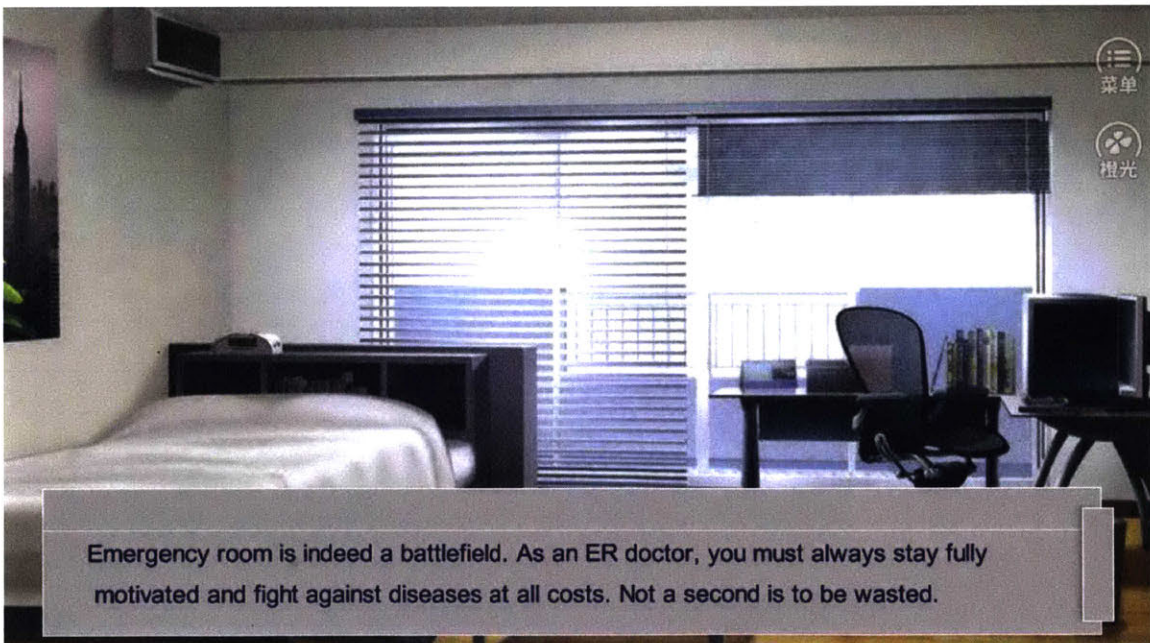


Figure 3-9: The opening narration part 2

Here comes the first scenario. When you arrive at the hospital, you receive a patient complaint about your treatment. The patient insists that it was all your

fault, but you followed the standard protocol and feel like you did nothing wrong.

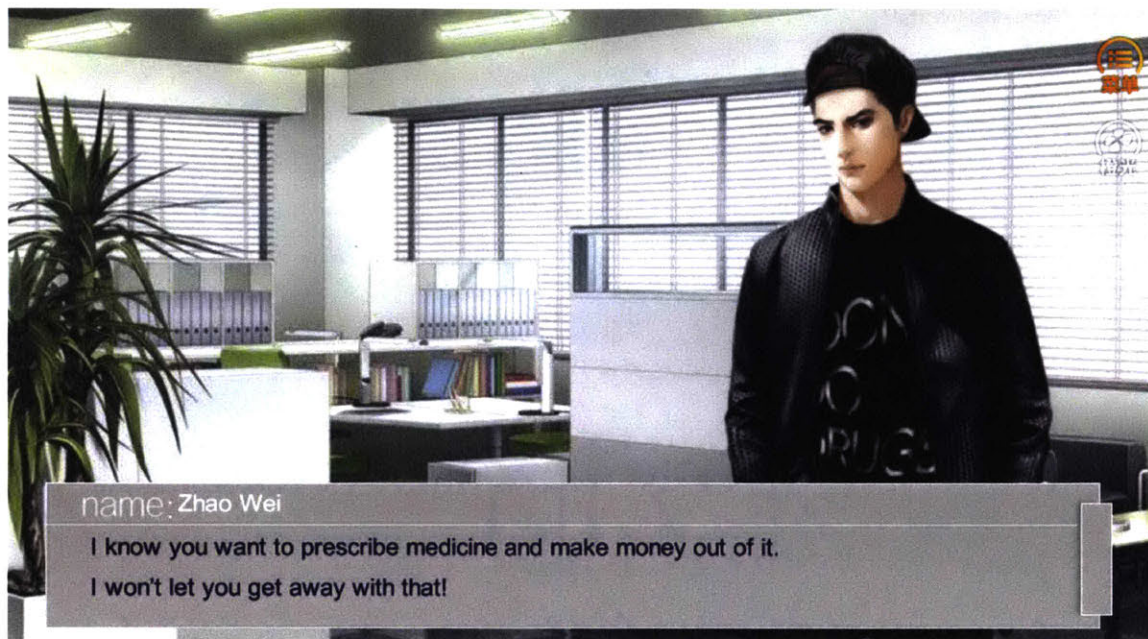


Figure 3-10: First scenario: patient complaining

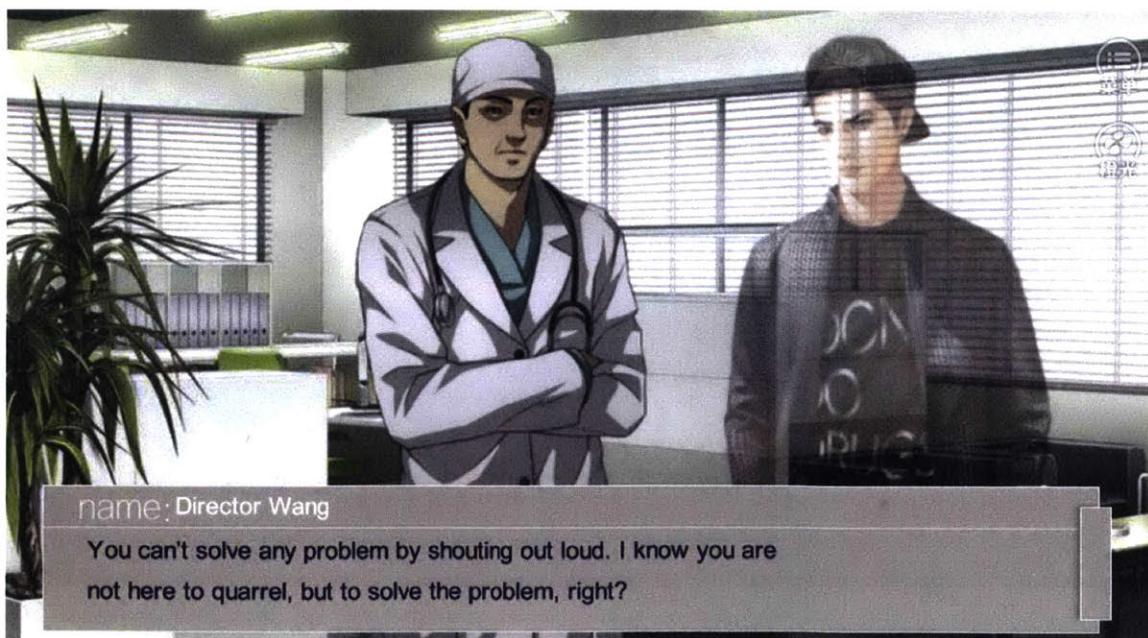


Figure 3-11: First scenario: director soothing the patient

At this point, you are asked to deliver an immediate solution to this complaint.

Then two options pop up on the screen: you can choose either to insist no fault and file a report explaining your practice, or take the fall and apologize to let it pass.

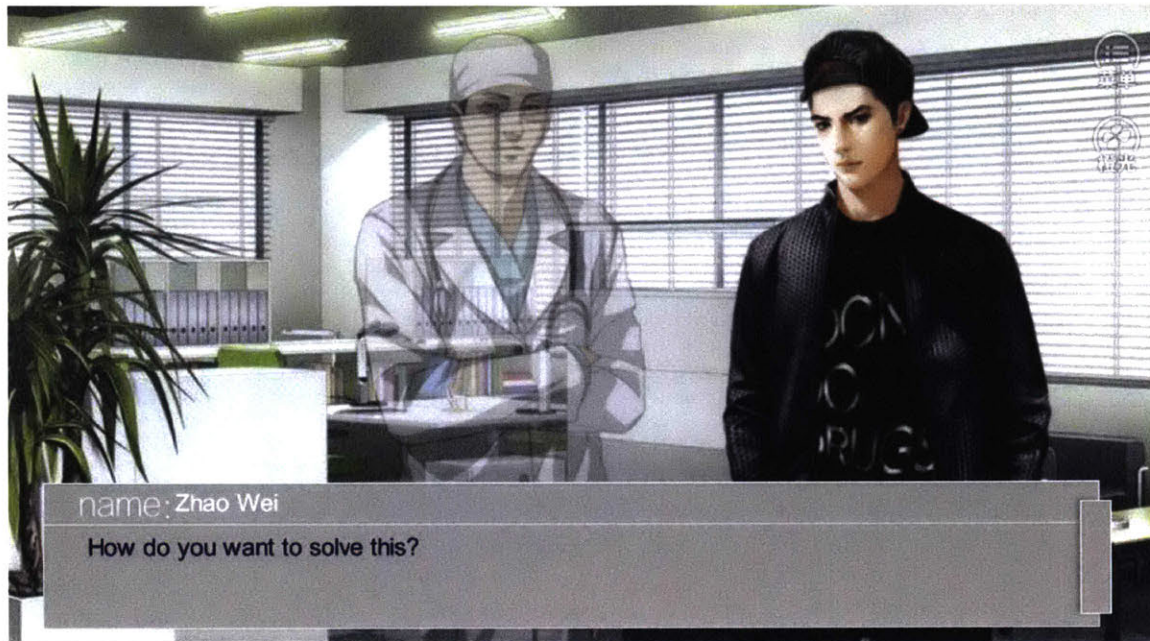


Figure 3-12: First scenario: patient responding to the director

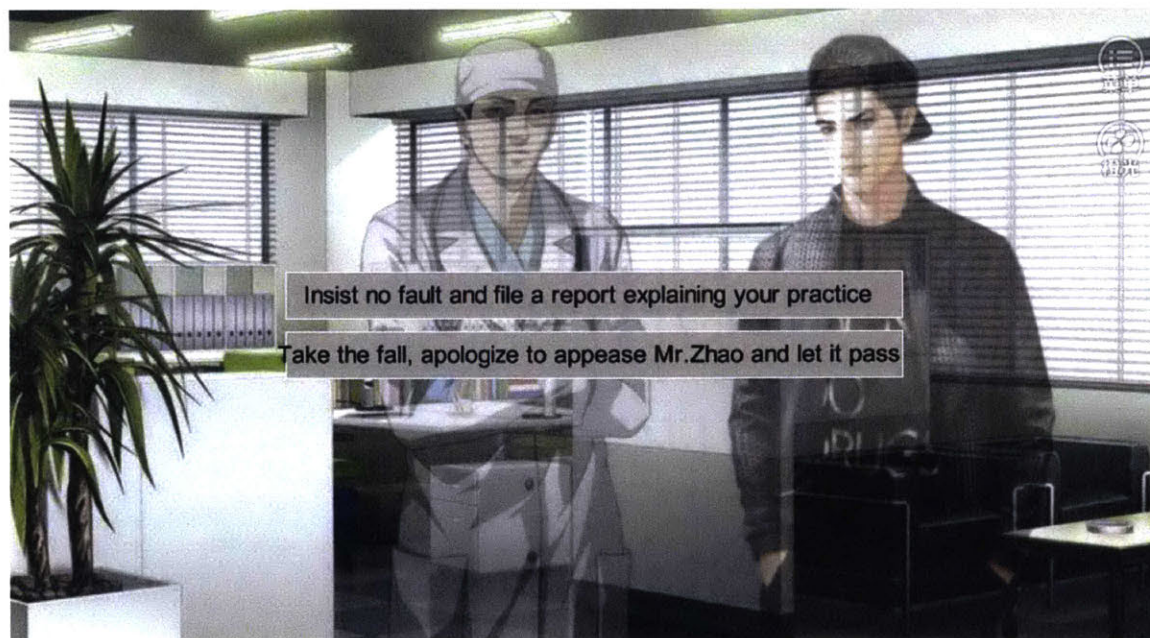


Figure 3-13: First scenario: options that branch the narrative

After selecting a choice, a certain consequence will be shown on the screen specify-

ing the outcome associated with your action. After this page, you are given a reflexive moment with two options to contemplate on the choice you made.

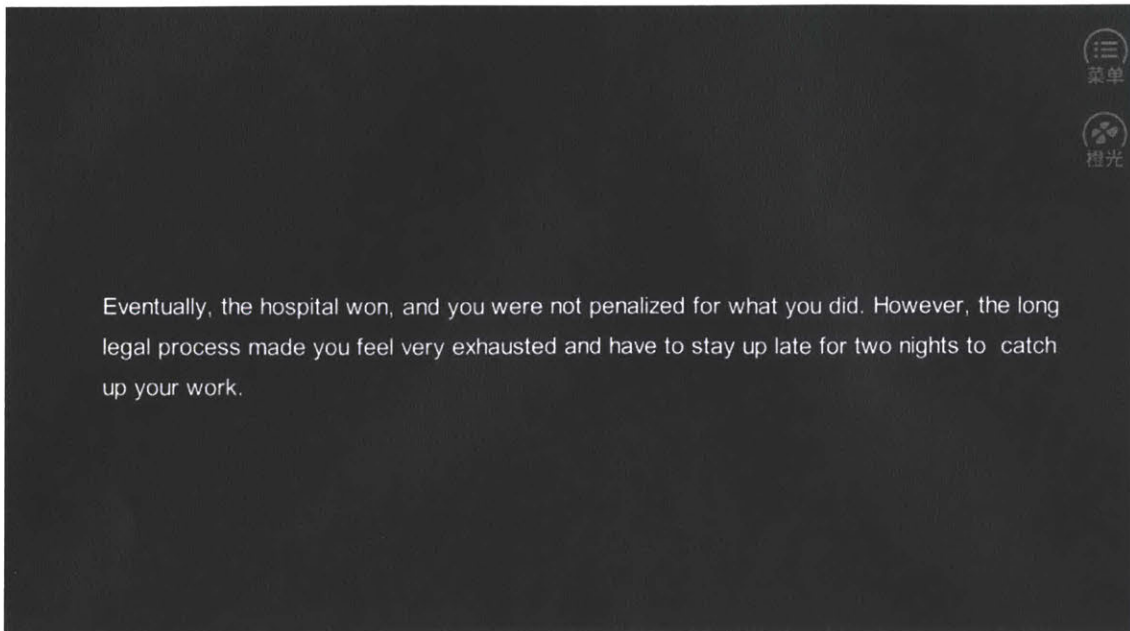


Figure 3-14: First scenario: the consequence of one route

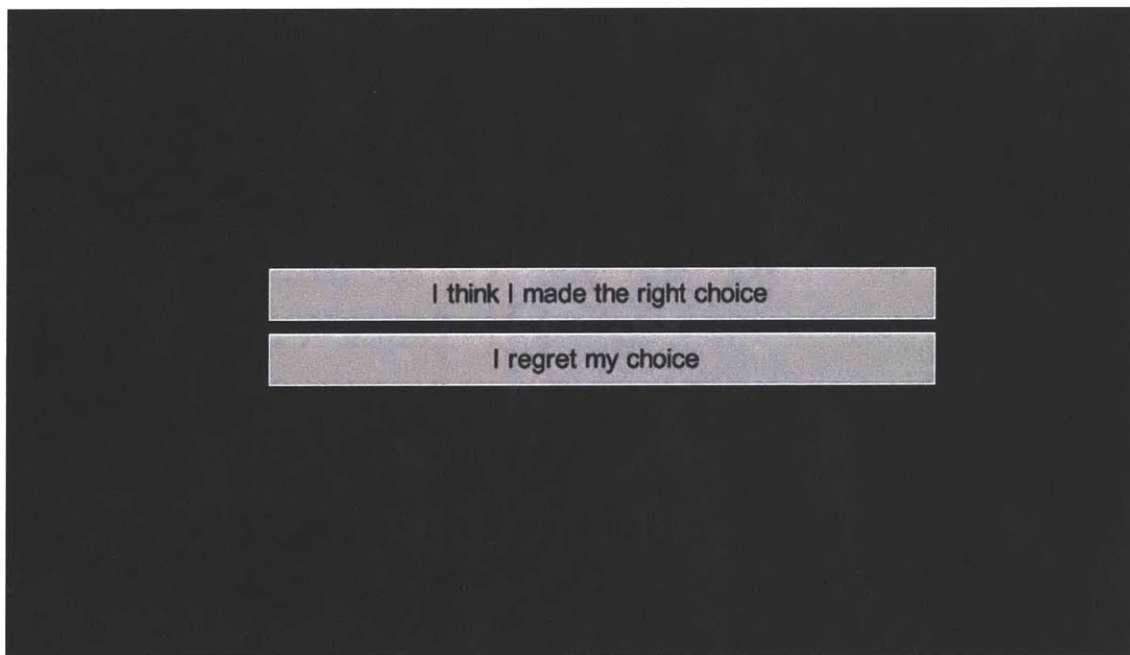


Figure 3-15: A self-reflective moment after making a choice

These screenshots are only a small part of the first scenario, but they can give you

a taste of what the actual game looks like. The game not only simulates the real life doctor-patient interaction, but also brings to light the key problems in the Chinese medical establishment. In this case, patient Zhao Wei attributed his fever to your malpractice, although you followed the standard protocol and did nothing wrong. Knowing that the patient is deliberately giving you a hard time, you can either argue for yourself or take the fall. Those two options are both sensible, but both entail a cost. If you insist no fault on your part and spend thirty minutes filing a report, you might have to postpone the treatment of other patients. On the other hand, if you take the fall and let it pass, you could return to others in a timely fashion, but you might not want to compromise yourself by accepting what you did not do. At this moment, the player is faced with a dilemma, and the decision is not easy to make. However, doctors are faced with this kind of situation all the time and have to make a decision in no time because not a second is to be wasted.

When it comes to the consequences, each choice would lead to a unique consequence, with a caveat on the potential downside of this outcome. For example, in the first scenario, if the player chooses the first option, “insist no fault,” the consequence would be “After the report submission, the hospital trusted your decision, but the patient decided to go to the court to resolve this issue. The lawyer representing the hospital called you to his office and conducted a thorough investigation for two hours so that he can defend the hospital in the court. The hospital won, and you were not penalized for doing the standard protocol. However, the lengthy legal process exhausted you and resulted in your staying up late for two nights to catch up your work.” If the player selects the second choice, “take the fall,” the consequence would be “You paid 1000 RMB for the mistake and therefore could not afford a good LEGO present for your nephew’s birthday this weekend. However, this saved you the trouble of going through a potentially exhausting legal process, which you would face if you had a conflict with your patient.” The player might feel that the two consequences are equally unappealing.

In the project, I did not feel like ascribing perfect consequences to each selection. I intended to include both the good and bad sides of the consequence. The option you

ended up with might serve as a temporary solution, but there is always a tradeoff, as nothing is perfect. Right after the consequence page, as seen in Figure 3-15, the player is given a self-reflexive moment to ponder on the choice they made and the outcome associated with it.

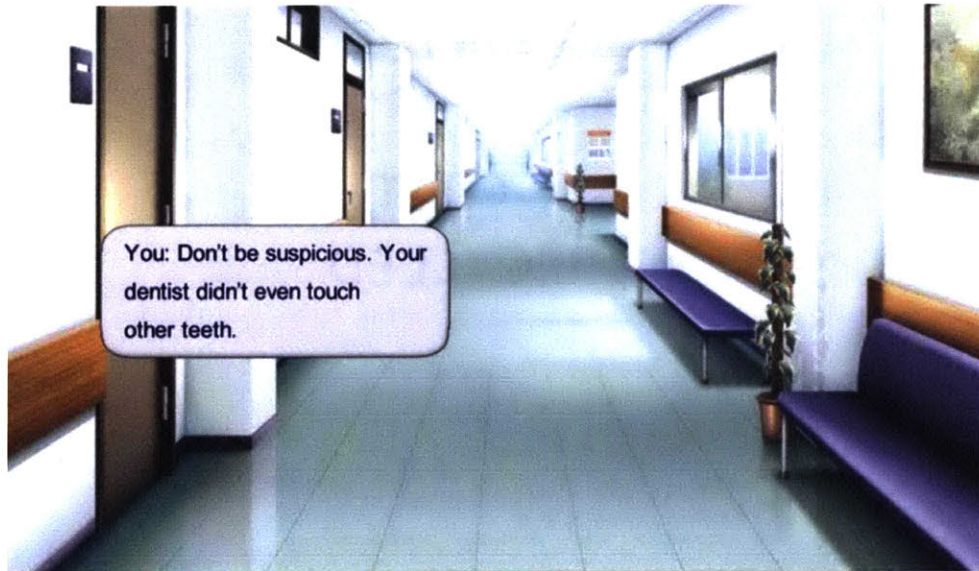


Figure 3-16: Text messaging with mother (the player side)

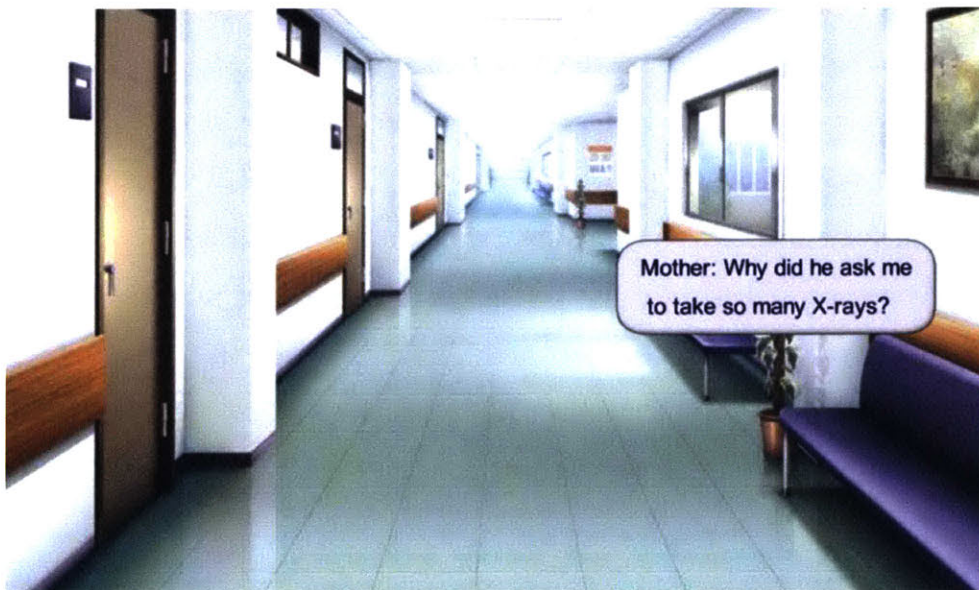


Figure 3-17: Text messaging with mother (the mother side)

For the scope of this thesis, only one of the five scenarios is elaborated and il-

lustrated. The rest of the scenarios are also meticulously designed with abundant details, different characters, and various settings. The narrative also takes on different formats to spur interests and avoid monotony. For example, one of the scenarios, shown in Figure 3-16 and Figure 3-17, adopts the format of text messaging to drive the development of the narrative: Just when you are about to take a short break, you mother texts you saying "my tooth fell out!" You are appalled and ask her to take a picture. It turns out to be the dropping of a temporary tooth filling. Your mother goes on to complain that her dentist was inattentive and overcharged her for a root canal. You tell her that the price is fair and that your hospital charges about the same. However, she remains skeptical and even suspects that the dentist put the filling in another tooth without her consent.

The text interaction between you and your mother drives the scenario forward, makes the player experience fun and lightheartedness, and highlights the ingrained distrust that many people of the older generations harbor toward doctors, even when there is nothing to be suspicious about.

After experiencing all of the five scenarios, the player would see the concluding remarks. At the end of the game, four inspiring paragraphs are shown on the screen encouraging the player to show more understanding toward doctors, while reminding them that improving the doctor–patient relationship requires everyone’s effort:

1. *Your short and wonderful doctor’s role playing has come to an end. Facing difficult choices, you will inevitably feel tangled, but more life-and-death dilemmas are happening every day in the hospital.*
2. *If everyone can learn more about what doctors do, if doctors and patients can be a little more patient, if both sides could show more empathy to each other, the doctor–patient tension will be alleviated.*
3. *If a doctor and patient met each other somewhere other than the hospital, they might become good friends. But with only a change of place, resentment and misunderstanding could pile up like a mountain, cre-*

ating a deep chasm between two innocent souls.

- 4. To improve the doctor–patient relationship, there’s still a long way to go. But Doctor Simulator is willing to make efforts to march on this rugged road, overcoming all obstacles, and cracking off the ice in people’s hearts. Do you want to fight with me?*

Indeed, cultivating empathy among the public takes time. Doctor Simulator is not meant to be an immediate empathy-building tool, but more of an innovative and nonintrusive way for Chinese people to facilitate perspective taking and raise awareness toward medical professionals. Rather than measuring whether people have gained (or enhanced) empathy after playing the game, I am more interested in how people react to and perceive this game and whether it could promote perspective taking and public awareness. To this end, a survey questionnaire was constructed to collect people’s feedback.

Chapter 4

Evaluation

4.1 Methods

4.1.1 Sample Data

The sample was constituted of 166 people, encompassing a wide geographic and age range in China. As illustrated in Figure 4-1, about a half (48.8%) of the sample population come from Beijing, which is not surprising, as it is the capital of China, where the population is densest. The color blue indicates the number of participants who answered the survey. As the number of participants grows, the color becomes darker. It is easy to see that Beijing, which is located in the northeastern part of the map, is the darkest spot. About 11% of the sample population are from countries abroad such as the United States and Britain.

These individuals were collected using snowball sampling, beginning with posting the link of the survey on my WeChat social network. Then the friends on my WeChat forwarded this post to their own social networks, with friends' friends doing the same. That was how the sample size got accumulated and increased. This sampling method was low-cost and allowed me to gather my sample quickly. However, the sampling was non-probability based, meaning that the sample was not obtained by random sampling. The participants collected for this survey might not be representative of the entire Chinese population, so the generalizability of the data was limited. About

4.1.2 Survey Instrument

The purpose of this survey was two-fold: First, I want to know people’s reaction about the game and whether the game is helpful in perspective taking. Second, I was curious about people’s overall impression of the doctor–patient relationship. To achieve my objective, I constructed a survey instrument that contained 22 items: 11 items were about the game itself, 7 items on doctor–patient relationship in China, and the remaining four about demographics. At the beginning of the survey, I clarified that the context of the survey was about the doctor–patient relationship in China; the survey was completely anonymous, and there were no right or wrong answers. The link of the game was shown, and the respondents were asked to play through the game. Then they would see the 22 survey items in the above order. The survey was created on sojump.com, and can be seen in Appendix B.

Game Effectiveness, the key measurement in this survey, was designed as an index. I define game effectiveness as the extent to which people are satisfied with the results the game delivers, and I define index as a way of composing one score from multiple questions or statements that represent a belief or attitude. When measuring this compound concept, I identified the following dimensions:

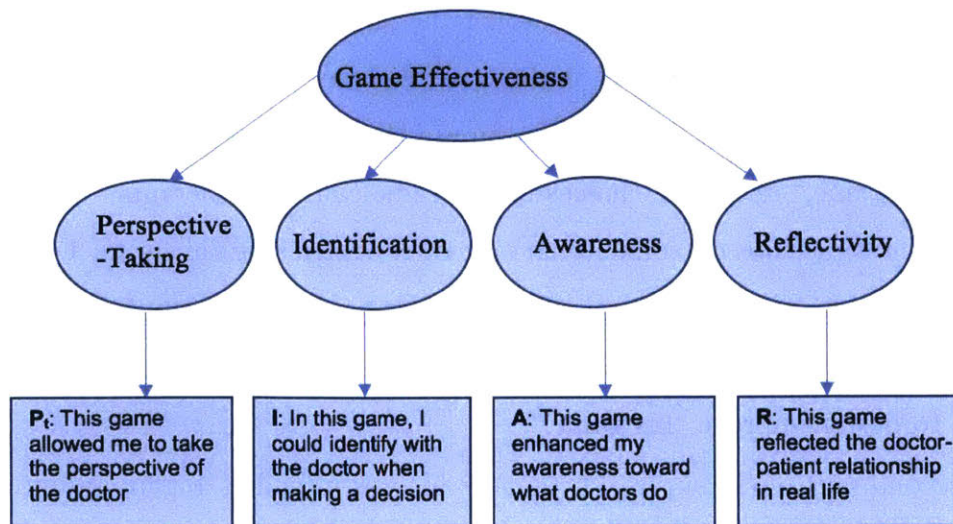


Figure 4-3: Game Effectiveness Index

These four indicators illustrated in Figure 4-3 successively came from the survey items “This game allowed me to take the perspective of the doctor,” “In this game, I could identify with the doctor when making a decision,” “This game enhanced my awareness toward what doctors do,” and “This game reflected the doctor–patient relationship in real life.” Respondents were offered five choices for expressing how much they agree or disagree with a particular statement. The choices for these statements were created based on the five-point Likert scale, namely 1=Highly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Highly Agree. Then a weighted average of the indicators was introduced, which combined them into a single index. The Cronbach’s alpha for the four items was 0.8, suggesting that my indicators have high internal consistency.¹ They evaluated a concept from different angles and I regarded them to be equally important when measuring whether the game was effective. Therefore, I assigned equal weight to each. My equation for building this index is:

$$E = \frac{P_t + I + A + R}{4}$$

where E is the game effectiveness index, P_t is the perspective taking score, I is the identification score, A is the awareness score, and R is the reflectivity score.

In addition to measuring game effectiveness, there were also items evaluating the technical side of the game—that is, whether the player could easily navigate through the game and whether the options made sense to them. Sample questions included “I was able to easily navigate through the game,” “I think there was no right or wrong choice in the game,” and “The choices in the game caused a dilemma.” Furthermore, apart from multiple choices, some items were open-ended short answers. For example, there were questions such as “Please briefly describe what you think was happening in the game;” “What do you think this game is about?,” and “What suggestions can you offer to better improve this game?”

The second part of the survey (7 items total) was intended to gain an understanding of people’s impression toward the doctor-patient relationship in China. This part

¹A reliability coefficient of 0.70 or higher is generally regarded as "acceptable" in most social science research.

was independent from the first part, and was not about the game anymore. All of the items were multiple-choice questions, with some questions allowing more than one answer. Here are all of the questions in the second part:

- What is your attitude toward the current doctor-patient relationship in China?
- What is your basis for making the choice in the above question?
- To what extent do you trust medical workers?
- Which side do you think is most responsible for the doctor-patient tension?
- What do you think doctors are mainly responsible for?
- What do you think patients are mainly responsible for?
- How do you find the role of the media in the doctor-patient relationship?

4.2 Findings

4.2.1 Technical Assessment

A play through of the game took approximately 8–20 minutes depending on the speed of reading. 166 participants answered the survey. In terms of the technical side of the game, as shown in Figure 4-4, 89% of the participants agreed that they were able to navigate through the game without difficulty. It seemed that 4% of the participants—five people—had trouble navigating through the game.

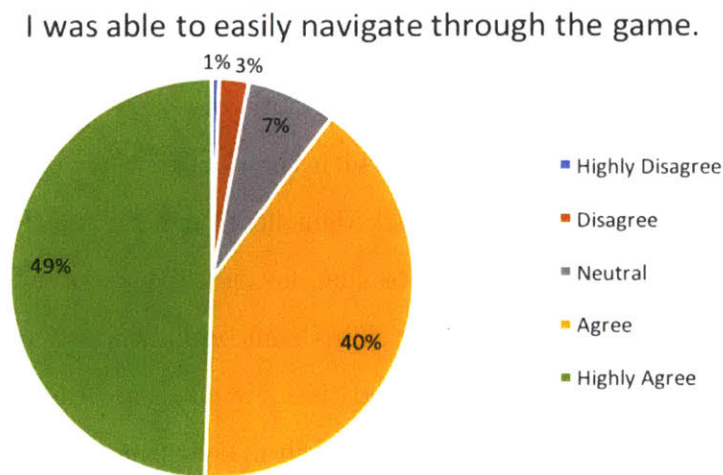


Figure 4-4: Game navigation (N=166, Mean=4.35, SD=0.77)

To evaluate the player’s impression on the choices, two statements were posed. As seen in Figure 4-5, for the statement “I think there was no right or wrong choice in the game,” 65% of respondents selected either Agree or Highly Agree; with 18% disagreed with the claim. For the statement “The choices in the game caused a dilemma,” about 45% of the participants agreed that the options caused a dilemma; Neutral (27%) was the second predominant category. 28% of the participants did not think the options caused them dilemma.

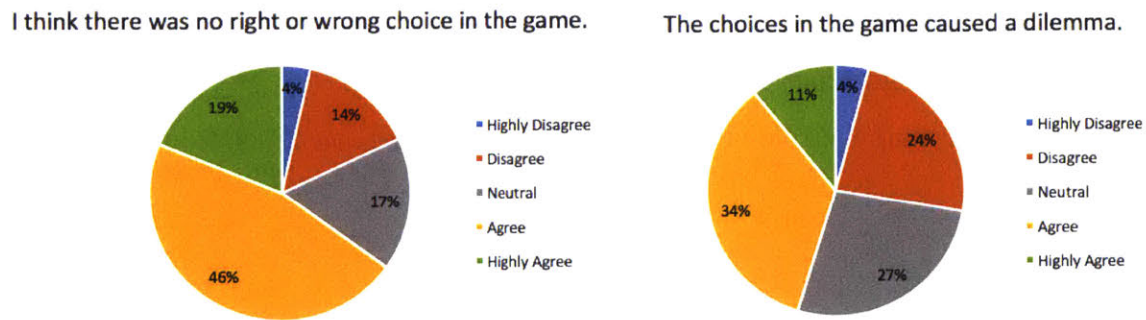


Figure 4-5: Game evaluation

4.2.2 Game Effectiveness

When it comes to Game Effectiveness, Figure 4-6 shows the results of the four indicators. For the indicator “Perspective-Taking” (This game allows the participant to take the perspective of the doctor), about 85% of the participants agreed that the game did allow them to take the doctor’s perspective, which indicated that the attempt to promote perspective-taking was successful. In terms of Identification, which states that “In the game, I could identify with the doctor when making a decision,” around 84% of the respondents expressed identification with the doctor when they made a decision. It is interesting to note that nobody disagreed with the indicator Awareness, which refers to the statement “This game enhanced my awareness toward what doctors do.” 85% of the players agreed that the game increased their awareness of the occupation of medical professionals, which makes sense, as the game revealed much detail about doctors’ daily jobs that the public would normally not otherwise get a chance to know. Another indicator, Reflectivity, measures whether people think

the game could reflect the doctor–patient in real life. As it turned out, 79% of the participants agreed that the scenarios in the game could mirror the doctor–patient relationship nowadays, which shows that most players in my sample consider the doctor–patient interaction in the game to be similar to that in real-life experiences.

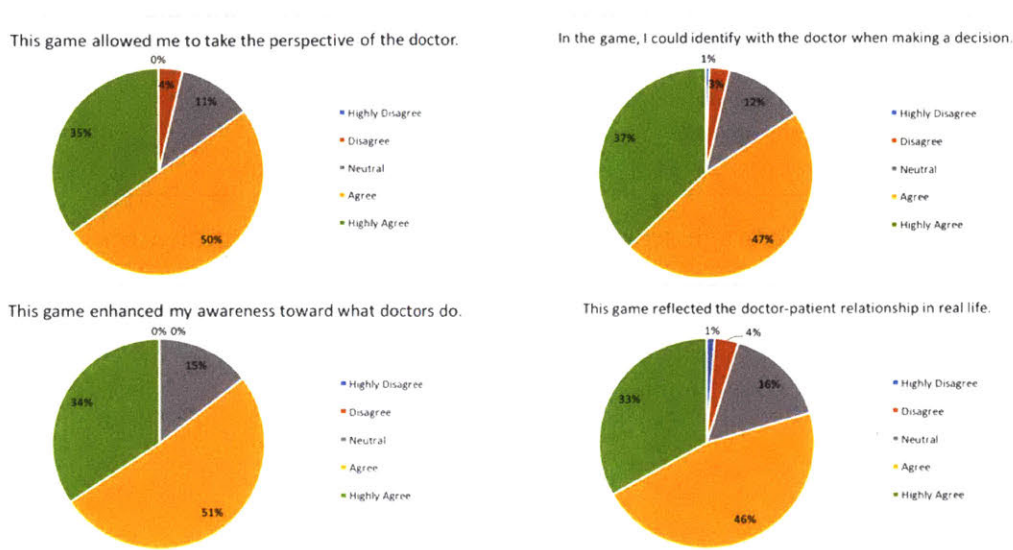


Figure 4-6: Game Effectiveness evaluation

The overall performance of Game Effectiveness was satisfying. The five-point response scale was coded as “1=Highly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Highly Agree,” so that the numeric values could be directly used as scores, with 1 being the lowest and 5 the highest. A revisit of my previous operationalization of variables suggested that Game Effectiveness was the sum of the four indicators listed in the table above, and each indicator was assigned an equal weight (0.25). The four aspects that constituted Game Effectiveness were fairly balanced without a noticeable drawback.

The average scores for Perspective–Taking, Identification, Awareness and Reflexivity can be seen in Table 4.1; they were 4.16, 4.17, 4.20, and 4.07, respectively, resulting in a total score of 16.60 for Game Effectiveness. The standard deviations (SDs) for the four items did not vary much from each other and were close to 0.8, which is within a reasonable variation because I have only five levels to choose from,

with an interval of 1. Although the evaluation method was not sophisticated, it gave a rough estimate of how it was received by the public and a general idea of how effective it was.

	Average Score	Standard Deviation
Perspective Taking	4.16	0.77
Identification	4.17	0.80
Awareness	4.20	0.67
Reflectivity	4.07	0.86

Table 4.1: Average score and standard deviation of indicators

4.2.3 Gender and Exposure

In statistical analysis, moderation happens when the relationship between two variables depends on a third variable. Although I was not able to perform a statistical analysis for the scope of this study, I would like to explore whether the outcomes would be different for different types of people. Normally, the effect of a layer variable is characterized as an interaction—a categorical variable or a quantitative variable that might influence the strength of the relationship. In light of the scope of this pilot study, there were two items that satisfied this standard—gender and exposure.

When it comes to gender, I tested whether the outcome would be different for men and women. Figure 4-7 shows the average score of each indicator for men and women. Men and women had almost the same score in terms of Perspective-Taking. For the rest of the indicators, female players had a slightly higher score—they outperformed their male counterparts by 0.15, 0.11, and 0.13 in Identification, Awareness and Reflectivity, respectively. These numbers were equivalent to an increase of 3.7%, 2.7% and 3.3% for female players accordingly.

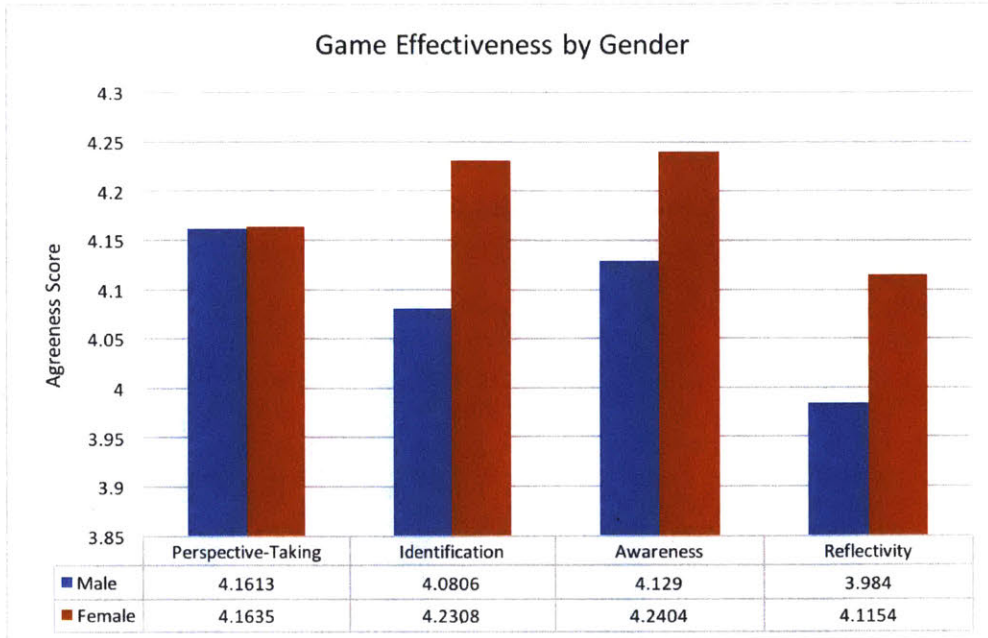


Figure 4-7: Game Effectiveness by Gender

Perhaps the reason for the almost identical scores for Perspective-Taking could be attributed to the relatively objective nature of this action. Although the ability to take someone’s perspective also matters, the game specified at the beginning that “you” are a doctor working in the Emergency Department (ER). The player was situated in the doctor’s perspective throughout, even though some were unable to take that perspective. The other three indicators, especially Identification, entailed more of a subjective evaluation. Whether the player could identify with the character’s feelings and thoughts is highly personal and varied among people. As for Reflectivity, different people might hold different opinions on how the game resembles reality, and they might even have different attitudes toward the current doctor–patient relationship. In this regard, it was not surprising there was a gender discrepancy.

Similarly, another variable on which to test the moderation effect is Exposure, which refers to the statement “I have experienced or witnessed scenarios similar to those in the game.” This is a binary variable with response options Yes and No, coded as 1 and 2. If a player selected No, it meant that he or she had no exposure to similar scenarios in real life. 73% of participants had exposure, whereas 27% of them

had not. The five-point response options for the four indicators were also coded as numeric values 1–5 and were used as scores.

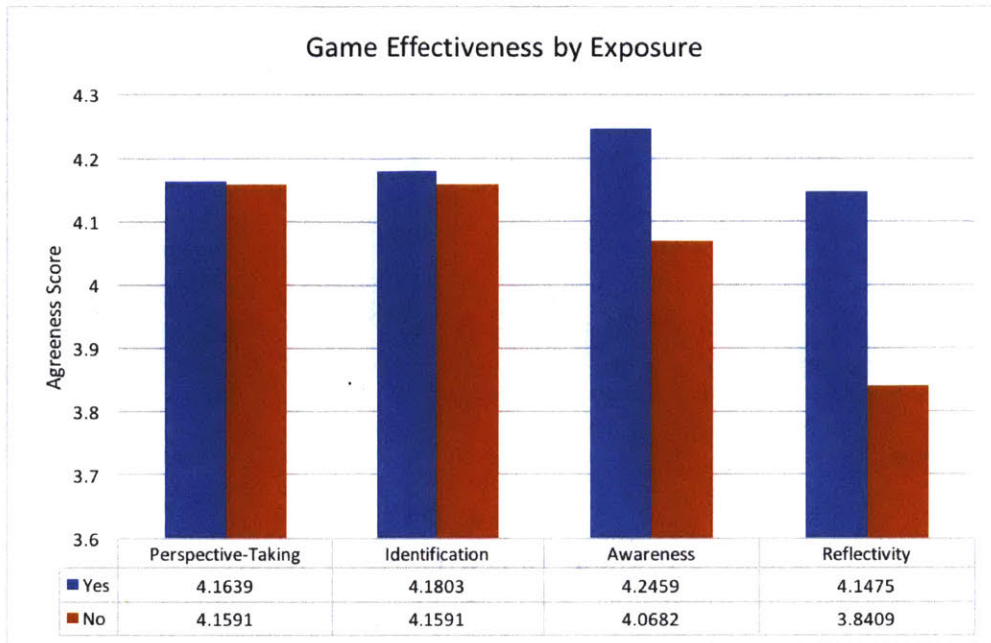


Figure 4-8: Game Effectiveness by Exposure

As shown in Figure 4-8, in terms of Perspective-Taking, there was almost no difference between the two groups. A possible rationale for this phenomenon was explained above. The difference for Identification was also slight (.02), which corresponds to a 0.5% increase in score for people who answered Yes. As for Awareness, people with exposure demonstrated a 4.4% score increase over people who had no exposure. This was a bit unexpected because I thought people with no exposure might gain more knowledge and awareness than people who already had exposure. Notably, when asked whether the game could reflect the real doctor–patient relationship, participants with exposure had an 8% score increase over people with no exposure, which makes sense because people with no exposure did not really know what the doctor–patient interaction was like in real life. As they did not have an image in their mind to compare with, they had no idea of whether the scenarios faithfully reflected the reality.

4.2.4 Attitudes on the Doctor-Patient Relationship

As mentioned before, the second part of the survey aimed to gauge people's impressions of the current doctor-patient relationship. This part is independent from the first section. The complete survey can be seen in Appendix A.

About 63% of the participants indicated that they were unsatisfied with the current doctor-patient relationship. 21% were Highly Unsatisfied, which was a considerable amount that could not be overlooked. 54 out of 166 (32.5%) were neutral on this issue, whereas only 2 participants (1.2%) selected Satisfied, and no one chose Highly Satisfied. Following up the first question, the next question asked for the basis for making the choice above (Participants could select more than one option); 81.3% made the selection from their own experiences. As a critical information channel, the media ranked second. About 47% of the participants relied on the media to form their attitude toward the doctor-patient relationship. Around 29% of the respondents formed their attitude from the experiences of family members or friends. Furthermore, when asked about the extent to which they trust medical workers, it was reassuring to see that about 70% of the participants chose "Trust" and 29.5% selected "Neither trust nor distrust." Only 1 out of 166 did not trust medical workers.

Participants were asked which side they think should take the most responsibility for causing the tension. About 41% thought the government should take the blame, whereas 17% considered the media to be the most culpable. 14.5% primarily blamed the patient, and 8.4% blamed the doctor. Interestingly, 19% selected "Others," with their answers revealing the broad and complicated nature of this question. Some said that this was due to the unique environment of China, which incubated the unique medical system. The existing medical resources could not match the soaring population growth and the growing need for medical resources. Others said this could be traced back to ancient society, where the dominant culture did not treat doctors with enough respect, and that tradition has persisted until now. Nevertheless, most people commented that all sides were responsible for the current tension.

Because talking about governmental factors would be a complex topic, it was

not selected as the focus of this survey. Participants were asked what they thought doctors were responsible for; 44% answered the lack of service awareness. A warm smile or a simple greeting would make the patient feel cared for, but what invariably awaits them after hours of queuing was a cold “Next!” with a serious face. Ranked second was “bad medical ethics,” which 25.3% of people chose. About 20.5% believed that doctors did not have much to be responsible for, and 10% thought the reason for the tension was insufficient medical technologies. About 58% of people blamed patients for being easily influenced by bad sources and lack of rational thinking.

It is crucial to be able to treat information discriminately in order to avoid being manipulated. However, in reality, many people still became the targets. 28% of participants attributed the tension to the patient’s lack of medical knowledge and the patient’s lack of awareness of what doctors do; 11% of participants attributed the tension to the low moral ethics, leading to the tendency to stir up trouble. Only 5 out of 166 (3%) considered that there was not much to blame on the patient’s side. 57% thought that news reports are often partial, seeking sensational effect and overlooking the investigation of the case itself. 20% of them considered news reports to be unscientific, exaggerating malpractice and misleading the public. 25 out of 166 found the role of the media to be factual overall, but it lacks depth in news stories and it does not provide enough guidance to the public. About 8% of the participants were positive about the role of the media, saying that news reports were objective and honest, which was helpful for improving the doctor–patient relationship.

4.3 Qualitative User Feedback

4.3.1 Technical Accessibility

In addition to multiple choice, short answers were also used as part of the survey to solicit more detailed feedback. When asked “Please briefly describe what you think was happening in the game,” most people were able to recognize that they were experiencing multiple scenarios in the ER through the doctor’s perspective and had

to make a decision that might challenge their ethics and impact the life of patients. For example, a simple answer was “a day of an ER doctor.” The following were more complete answers demonstrating thorough thinking: “you are taking the doctor’s lens to tackle some thorny issues pertaining to ethics;” “experience some real stories that might happen in real life, use own judgment to choose and bear the consequence, and get feedback for one to contemplate;” and “multiple scenarios showcased the dilemma that the doctor, the patient and their family members would face, and different consequences that different options would generate.” Except for only a few cursory answers, most people had played through the game and were able to recall what happened in the system without difficulty.

4.3.2 Fun and Flexibility

In regard to the question “What suggestions can you offer to better improve this game?,” numerous valuable suggestions were received, concerning the following key aspects: first, it could be more fun, entertaining and flexible. There could be more animation effect, such as the movement of the characters to make the scenarios more vivid. In the current version, the scenarios are in chronological order, and the player has no choice but to play from beginning to end. The game could add more flexibility by allowing the player to select the scenarios they want to play at the beginning so that players could skip unwanted scenes. In addition, it would help if the text were more concise. Participants aged 40 and older mentioned adding an audio version would be extremely helpful. Many players did not have the patience (or the ability) to read much text. If the dialogues were audible, players would be more immersed in the scenarios and thus could better relate to the doctor’s stance. It would be easier to blend people into the story and spare them the energy to enjoy other game elements.

4.3.3 Reality and Sensitive Issues

Several participants mentioned that the game could involve real-life cases that were reported by the media. In those cases, I should highlight other systematic factors that

might give rise to the doctor-patient tension nowadays. Some suggested that all of the cases could be real cases, with the specific dates, real pictures, detailed statistics and the amount of medical costs in order to make the narrative more emphatic and alarming. Both doctors and patients were responsible for the tension, and it would be more objective to comment on some sensitive issues—for example, whether the doctor has ever had the problem of prescribing unnecessary medicine to patients, and if he or she has ever mishandled relationships with colleagues in a manner that contributed to the rift. After all, inconsiderate patients and their family members are not the only ones to blame for the current doctor-patient situation.

4.3.4 Debate of Options

In terms of the options, some participants really liked the dilemma in the choices because they reflected what doctors would face in real life. As one participant commented, “The design of the choices was brilliant! It gave the player a fairly direct feeling of what the reality is. Doctors face numerous situations involving dilemma at work where most of the time they need to be decisive, but the fault tolerance rate is extremely low. Therefore, they face a lot of risks that we ordinary people could not imagine. I think the game could positively guide the public to take the doctor’s perspective, and help them realize that doctors are not omnipotent.”

Although the two-option design was appreciated by some people, others also suggested creating some “in-between” options that would reach a compromise and not hurt anyone’s feelings. They said they felt torn during the game because the options were too limited, and they knew that neither option would lead to a perfect outcome. Some mentioned that neither option expressed what he or she thought. As much as I would like to make each side happy, in real life this is rarely the case. For doctors, sometimes there is a tradeoff in decision-making, and they must be clear about what they are willing to sacrifice in order to achieve their priority. Two options seem to be a reasonable design for me, as I do not want to complicate the matter; but in some cases, if necessary, adding one or more options could also be considered.

Chapter 5

Discussion

5.1 Conclusion

The formation of doctor–patient relationship is a fluid and complex process within which a confluence of historical, economic, political, cultural, media, technological factors also plays an important role. This study is a pilot work in which I focused on one side for a polarizing issue—patients do not fully understand doctor’s challenges and the media exacerbates the tension. By presenting the categories of the doctor–patient tension, I outlined the main systematic factors by the source of tension, and explained how I integrated the key themes in my game into those frameworks.

Despite these varied factors that impact the doctor-patient relationship, the media itself is also culpable for exacerbating the tension. I provided an overview of relevant theoretical frameworks of news, which served as the foundation when discussing the limitations of the media. Notably, when reporting a conflict or an issue that is of news value, the media tends to use episodic frame to approach the issue from a highly personalized way, emphasizing dramatic parts of human-centered stories. For hard news that depicts issues from a generalized and factual perspective, there seems to be a tendency of downplaying the systematic reasons behind a phenomenon. Focusing on the personal and dramatic aspects of an issue is likely to produce biases, preventing the public from getting a whole picture of the story. Sometimes, due to time constraints, reporters themselves might not be able to fully investigate the

complete version of a story as well. My project is especially valuable in this aspect, because it allows reporters to go through a complete case that is similar to that in the real life, and give them a chance to hear the voice from both sides. The reporters may be endowed on a more comprehensive lens when they explore a case and publish a story next time.

Whereas economic and social interventions may take long to bear fruitful results, media could be a relatively fast remedy if used appropriately. A literature review suggests that narrative is the most basic mode of human interaction and is used widely in a range of fields, with promising effects in the context of health. As no study to date any tangible intervention in face of the exacerbating doctor–patient tension in China, this thesis makes up for this gap by creating a visual novel game called Doctor Simulator to address typical topics that surround the contemporary doctor–patient relationship. The game not only provides a commentary to certain social phenomenon, but also allows people to take the perspective of the doctor and experience their daily job routine. It is hoped that Doctor Simulator could promote perspective taking, raise public awareness and foster greater understanding toward medical professionals.

Both quantitative and qualitative methods have been utilized to assess the effect of the game. An index called Game Effectiveness is created to evaluate how effective the audience perceive the game. The overall performance of Game Effectiveness is very satisfying. Based on a survey distributed to 166 participants, more than 80% of them agree that the game allows them to take the doctor’s perspective (Perspective Taking), identify with the doctor when making a decision (Identification) and increase awareness of what doctors do (Awareness). About 78% of them agree that the game could reflect the doctor-patient relationship in real life. When taking gender into account, the results of Game Effectiveness demonstrate differences in terms of Identification, Awareness and Reflectivity but not much in Perspective Taking. As for the effect of exposure (whether the participant has experienced scenarios similar to those in the game), people who have had exposure have higher scores in terms of Awareness and Reflectivity than people with no exposure, but these two groups do

not differ much in terms of Perspective Taking and Identification.

My findings for people's attitudes toward the doctor-patient relationship generally match with the national statistics reported on this matter. The majority of the participants are unsatisfied with today's doctor-patient relationship, and the government is selected as the most responsible side to take the blame. The second most culpable factor is the media, with more than a half of the participants believing that news reports are often partial, seeking sensational effect and overlooking thorough investigation of the case itself. When it comes to the doctor's responsibilities, 44% of the respondents think that doctors generally lack the service awareness, and a quarter of them put the blame on bad medical ethics. As for the patient's side, the majority of the participants think that patients should be blamed for a lack of rational thinking and thus are easily misled by bad sources. The ability to use critical thinking and treat information discriminately is still wanting in the public.

Numerous valuable suggestions have been received regarding how to improve the game. Notably, the game would be more entertaining if it allows the player to select the scenarios they would like to play at the beginning so as to unwanted ones. To further enhance the experience particularly for elder people, adding an audio version in addition to the text could alleviate the burden of reading and immerse them more into the scenarios. What's more, the game will be improved if it could be more interactive. Ideally, people could choose which character they want to play and have real-time interaction with one another to augment the perspective taking experience.

5.2 Limitations

Although the intervention proposed in the thesis has revealed promising results, it is not without limitations. First of all, there are several limitations with the snowball sampling method. The first participants who came directly from my contact list are likely to have a strong influence on the sample. Secondly, there is lack of control over the sampling method. It is challenging to identify the appropriate person to conduct the sampling and find the desirable amount of people for each age group and geo-

graphical location. In addition, the sampling was non-probability based; participants in this sample might not be representative of the entire Chinese population, which limited the generalizability of the data.

Another aspect that can be improved is to collect more test data to conduct statistical analysis. Due to the limited sample size, I was able to do only a descriptive analysis of the data. The current sample size of 166 is good enough get a general understanding of the game effectiveness, whereas a larger data set will enable a more refined operationalization of variables. Statistical techniques such as regression could also be done to better understand the moderation effect and significance of the results.

One of the major limitations of the current research method for Game Effectiveness analysis is the lack of comparison. The current survey obtained the user feedback only after the user has played the interactive narrative game. To better understand the effectiveness of the game, two different sets of survey should be carefully designed to evaluate the participant's understanding before and after the game, that is, constructing a pretest survey and a posttest survey. In addition, as a proxy for the concept Game Effectiveness, I have included four dimensions: Perspective-Taking, Awareness, Identification and Reflectivity. I assigned an equal weight for each when making the index because no literature suggested which parameter should be superior, and I did not want to randomly assigned weighting to each indicator without evidence. In the future, more research in game studies, media studies, psychology and sociology could be done to make this concept more rigorous and comprehensive.

The survey itself could also be refined by including more items relevant to each indicator. For example, for the indicator Perspective Taking, one statement could not capture the whole concept. Usually, perspective-taking is a complicated concept pertaining to social psychology and involves a variety of dimensions to measure. The current version of the survey takes into account the potential fatigue of participants and therefore is not designed to be exhaustive. In the future, with a new budget, participants could be rewarded to fill out a survey that contains established measurements of perspective taking to acquire a more desirable result.

5.3 Future Works

For the scope of this pilot work, I aligned with one of the theories in perspective taking that states that perspective taking could enable empathetic feelings and lead to a more positive attitude toward the whole group. However, there are competing theories on perspective taking. For example, some studies already showed that perspective-taking sometimes had the opposite effect [48] [40]. Future works could also take that into consideration and use the concept of perspective-giving or perspective-making to compare the findings.

In terms of game design, it is important to create a character who possesses the general traits of a real doctor. The character setup is not meant to produce stereotypes of what doctors should look like, but rather give the player a more realistic feeling when navigating through the game. The player should also be given the freedom to customize the appearances of selected characters. Currently, the game has restrictions on the character setting and graphical style due to the limited resources and capabilities of the Orange Light engine. Some characters and background pictures may look a bit out of the place. However, in the future, if a team consisting of artists, game designers and computer scientists can be assembled, the portrayals of the characters and the overall style could be refined and unified.

Future work could also consider using representative news stories from the past. Specific dates and real pictures could be shown to highlight the severity of a case. Detailed statistics could also be incorporated to make the narrative more convincing and alarming. It would be more objective to include some sensitive and trending issues occurred in society. For instance, the extent of medical bribery in a reputable hospital or problems with prescribing medicine. It could also include how news reports are biased and how the media is exacerbating the issue at hand.

The game would have been better if scenarios would be created in which other factors—media, insurance, doctors, structural problems, and so on—are to blame. Currently, the scenarios are doctor-centric and mainly encourage the public to take the perspective of the doctor. However, perspective taking involves two sides, and it

is also important to address the other route, in which the doctor takes the perspective of the patient. The scenarios could be reframed to reflect the patient perspective as well as their mental activities and thought processes. It would be more realistic to make scenarios where patients have legitimate gripes and are not just complainers.

Appendix A

Interview Questions for Doctors

A.1 General Questions

1. What are the standard procedures of doctors when they see a patient?
2. What are the names of the different rooms in your department?
3. Describe the different tiers of doctors and the responsibilities with each tier (e.g. first-line, second-line, third-line).
4. Briefly describe your daily job routine.
5. Please share some memorable stories of encounters with patients.
6. Have you experienced any conflicts with patients before? How did you deal with the conflicts?

A.2 Specific Questions

1. Is it normal for a doctor to have a 24-hour shift?
2. If patients refuse a gastroscopy, are there any other ways to treat them?
3. Under what circumstances do you rely on your experience to make a judgment?

4. What are your department's requirements for prescribing medicine?
5. What do you say to patients when they refuse or fail to cooperate?
6. When you encounter a patient who cannot afford a medical expense, what can the hospital do to help? What do you suggest to the patient?

Appendix B

Survey Instrument

B.1 About the Game

1. I was able to easily navigate through the game.

- Highly Disagree
- Disagree
- Neutral
- Agree
- Highly Agree

2. I think there was no right or wrong choice in the game.

- Highly Disagree
- Disagree
- Neutral
- Agree
- Highly Agree

3. The choices in the game caused a dilemma.

- Highly Disagree

- Disagree
- Neutral
- Agree
- Highly Agree

4. Please briefly describe what you think was happening in the game.

5. What do you think this game is about?

6. This game allowed me to take the perspective of the doctor.

- Highly Disagree
- Disagree
- Neutral
- Agree
- Highly Agree

7. In the game, I could identify with the doctor when making a decision.

- Highly Disagree
- Disagree
- Neutral
- Agree
- Highly Agree

8. This game enhanced my awareness toward what doctors do.

- Highly Disagree
- Disagree
- Neutral
- Agree

- Highly Agree

9. This game reflected the doctor-patient relationship in real life.

- Highly Disagree
- Disagree
- Neutral
- Agree
- Highly Agree

10. I have experienced or witnessed scenarios similar to those in the game.

- Yes
- No

11. What suggestions can you offer to better improve this game?

B.2 About the Doctor-Patient Relationship

12. What is your attitude toward the current doctor-patient relationship in China?

- Highly Unsatisfied
- Unsatisfied
- Neutral
- Satisfied
- Highly Satisfied

13. What is your basis for making the choice in the above question?

- From my own experience
- From the experience of family members/friends
- From the media

- Others (please specify)

14. To what extent do you trust medical workers?

- Trust
- Neither trust nor distrust
- Distrust

15. Which side do you think is most responsible for the doctor-patient tension?

- Doctors
- Patients
- Government
- Media
- Others (please specify)

16. What do you think doctors are mainly responsible for?

- Lack of service awareness
- Insufficient medical technologies
- Bad medical ethics
- Not much to be responsible for

17. What do you think patients are mainly responsible for?

- Lack of medical knowledge and awareness of what doctors do
- Easily influenced by bad sources and lack of rational thinking
- Low moral ethics and tendency to stir up trouble
- Not much to be responsible for

18. How do you find the role of media in the doctor-patient relationship?

- The news report is objective and honest, which helps to improve the relationship
- The news report is overall factual, but lacks the depth and guidance to the public
- The news report is often partial, seeking sensational effect thus overlooking the investigation of the matter
- The news report is very unscientific, exaggerating malpractice and misleading the public

B.3 Demographics

19. Your gender:

- Male
- Female

20. Your age:

- Under 18
- 18 ~ 25
- 26 ~ 30
- 31 ~ 40
- 41 ~ 50
- 51 ~ 60
- Above 60

21. Your education:

- Elementary school
- Middle school

- High school
- Bachelor
- Graduate and above

22. Your occupation (optional):

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