ABSTRACT

Interpersonal Ethical Communication via Virtual Environment Influences

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In search of a more narrative-embedded approach to communication between players of video games, this paper provides the details of a study in which players are tasked with learning about other players merely through interactions with third-party Non-Player Characters (NPC). Players progressed through one of two interactive stories, inputting or extracting ethical ideas from the characters. Three ethical questions derived from the Moral Foundations Theory questionnaire were tested. One performed considerably well while the other two failed to fall into the upper quartile of optimal results, but only by a relatively small amount. The data collected therefore indicated a core viability for narrative-embedded communications in video games to accurately translate ideas between players. The experiment demonstrated the potential for games in the future to rely on the digital representation of players' personal ideologies to become a part of gameplay and player interactions.

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INTERPERSONAL ETHICAL COMMUNICATION VIA VIRTUAL ENVIRONMENT

INFLUENCES

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By

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CHAPTER ONE

Introduction

Video Games' Modern Evolution

An Experimental New Paradigm

Games' Unique Potential. The artistic communication of information has always been one of mostly linear translation from creator to audience. Books, films, television shows, paintings, etc. all have one or more themes that creators put into the artistic work and are subsequently received an audience. Even performance arts essentially involve performers sharing the roles of both creator and audience to each other and the live audience. The creation of art therefore remains solely within the realm of those who are already in the business of creating art.

However, in the last 30 years, the motivation for strong narrative in the newest medium, video games, began making radical changes to this paradigm. For the first time, humanity began to see the growth of a medium in which the creation of art was a joint effort: both creator and player contributing to the experience that is gameplay (Buckler 2012).

Video games possess a hypothetical, untapped capacity for radically altering this communication dynamic thanks to their interactive nature: audience members, i.e. players, may fully become empowered by the artistic work itself to contribute to its ongoing creation as a work of art and consequently become co-creators of art themselves.

To evaluate whether this is truly possible, one would need to verify to what extent games can house the ideas of players and to what extent they can relay ideas to other players. An experimental study to determine the feasibility of this concept is therefore prudent and of considerable interest to the future of video games research. However, to examine exactly how this research is possible and how it fits into the current state of games research, an overview of video games' history is necessary.

A Brief History

The Problem Develops. The incredible drop in the cost of technology in the early 2000s led to the development of consumer expectations regarding the quality of video games. Each new console generation tended to increase the previous generation's abilities by immense factors: RAM, a factor of about 10; Resolution, about 5; Color Diversity, about 100; Polygons-per-second, about 100. The price is decreasing drastically as well, with the approximate RAM per inflation-adjusted USD ($1) at a factor of about 10 (Orland 2013).

With new console generations displaying massive jumps in performance at reasonable cost, consumers sought out games that could take advantage of the powerful technology. However, strong graphics and a robust online infrastructure for community play required massive budgets which in turn required investors and risk-management. Very soon, game culture grew into a risk-avoiding, stagnant state in which investors would only approve to produce those games which could merit a reliable investment, i.e. the games that had already been released with a proven market value. This led to an oversaturation of games without much innovation. After all, changes to games could

potentially disrupt the interest of consumers and stop the influx of funds (*The Economist* 2014).

Tools For Revolution. The first sign of change began to occur as Valve released its digital distribution platform Steam in 2003. This allowed independent developers to acquire strong marketing for their projects as well as host their games for downloading at a shared-revenue price ("Video Game History Timeline" 2016). This proved to be a much cheaper method of distributing games than creating physical materials (disk, case, safety warnings, manual) and then having to pay to ship them to desired marketplaces. Instead, developers simply put it up on the Internet, locked behind a pay-gate and easily available to people all over the world at a fraction of the price.

The next great shift came with the arrival of the Unity game engine in 2005 and its subsequent competitor in 2009, the Unreal Development Kit. These sophisticated applications were freely available to users for non-commercial use and could be licensed at relatively low-cost to develop commercially. Instead of developers having to devote time, energy, and resources to developing the tools for their trade, they could instead jump into the development of games immediately and receive free updates that improved the underlying technology ("Excel with Business - The Rise of Unity3D" 2016).

The mobile game space was the next critical growth to upset the industry. Suddenly, a global audience of casual gamers exploded onto the consumer market. Developers found that they could make a modest, and sometimes outright jaw-dropping, living by simply crafting tight, bite-sized game experiences with a simple interface ("Evolution of Mobile Gaming" 2016). Unlike PC and console development, these small

projects could have a ready beta form in a matter of two or three months compared with six months, a year, or even longer.

The final piece of the puzzle was the advent of crowdfunding. Kickstarter found its place in the game industry as a social media-based economic foundation that developers could rely on in place of publishing studios ("Video Game History Timeline" 2016). It provided much needed security to a previously perilous business place by ensuring that people had a core sum of money they were guaranteed right off the bat.

All together, these changes have caused an evolution in the game industry in favor of novel game experiences from small and middle-class game studios eager to find their place in a thriving community.

Narrative Novelty & The Future

Industry Maturation. The last decade has revealed the video game industry as a community that welcomes emotional experiences. Game series such as *Mass Effect* from Bioware (*Mass Effect 3* 2012) and *The Walking Dead* from Telltale Games (*The Walking Dead* 2012) give the player a chance to develop relationships with a variety of characters and ultimately make choices that impact the nature of those relationships. Other games, such as "That Dragon, Cancer" of Numinous Games (Larson 2012), have paved the way for games to address topics as serious and meaningful as dealing with the heartache of caring for a child with terminal cancer (Tanz 2016).

This emotional exploration through the medium of games is a galloping change that has rippled through the industry. Due to the game industry's infancy in existence, there is a growing attraction among players to engage with novel experiences. The future

of games will likely continue this trend just as other art forms have moved through various ages (Houghton 2014).

Games as a medium are currently marked by several different revolutions reminiscent of children going through puberty. By experiencing a growing interest in the cultural elements of games, concepts such as the degree and nature of female presence (Totilo 2016), ethnic differences (Grayson 2016), and meaningful narrative (Stein 2016) have ventured into new territory and helped the industry mature.

Future Development. The further expansion of novel applications of narrative in games is an assured trend in the future of the video game industry. As technology changes, so too will games; part of that change rests in the extent to which society can learn to leverage what games have to offer, including the nature of games' design, the manner in which players relate to games, and the capacity for games to both exert influence over players and to empower players to influence each other in interactive, global, and social ways.

Related Work

The field of game research opens the industry up to progressive change fueled by an understanding of the science of games. Numerous areas of study have already been explored, and each of them are equally relevant to the design of video games.

Presence.

Bracken & Skalski in 2009 conducted an examination of the effects of high definition video games in developing a sense of presence, i.e. a "perceptual illusion of nonmediation" and found that image quality had an effect on one's sense of spatial

presence. That is, when playing with games that displayed higher levels of realism, it was easier for players to embed themselves mentally within the game space more effectively (Bracken 2006).

Several studies also indicate the significance of immersion, narrative plausibility, and realism to the experience of presence and media enjoyment. Green, Brock and Kaufman reported in 2004 that transportation theory, the idea that people transport themselves into a narrative world when consuming media, has a positive relationship with one's capacity to enjoy media. They then likened transportation to the newfound research into presence with interactive media, speaking of how they both involve tricking the consumer into believing in the plausibility of the media content (Green, Brock, and Kaufman 2004)

In 2004, a team of researchers headed by Niklas Ravaja studied the development of presence and the emotional reactions that various genres of games inspired in players. They found that, "different video games elicit very different emotional response patterns and degrees of presence... [based on] users with different personality traits." They in turn recommended that game makers take advantage of distinct player motivations when deciding how to design a game's available interactions and aesthetic (Ravaja et al. 2004).

Shafer, Carbonara, and Popova, in an analysis of differing interactivity levels in gameplay had players play with games using controllers (low-interactivity), motion-sensing controllers on the Wii console (mid-interactivity) and body-tracking cameras on the Xbox via the Kinect and the PlayStation via the PlayStation Eye. They analyzed the relationships between spatial presence, media enjoyment, and the varying levels of interactivity. They found that 1) higher levels of spatial presence resulted in more media

enjoyment, 2) higher levels of interactivity resulted in more enjoyment (though possibly just due to their novelty), and that 3) interactivity did not necessarily have an impact on one's sense of spatial presence (Shafer, Carbonara, and Popova 2011).

Roth et al., interested instead in the effect of replaying the same games, found in 2012 that "players perceived their game-related actions to have the intended impact… and to run more smoothly… [leading to] more immersive experiences (presence)." Consequently, they determined that agency-based experiences had a positive effect on the level of gratification players felt as a result of the improved sense of feedback they received from confident gameplay (Roth et al. 2012).

Identification.

To better shape society's understanding of the player's relationship to their controlled characters in games, researchers Trepte and Reinecke investigated in what situations people developed higher levels of identification with their game characters. The results of their study divulged that the competitive nature of games (or lack thereof) had a meaningful impact on the degree to which players attempted to create avatars in their own image. Games lacking a competitive element fostered environments where players tried to customize their avatars to match themselves whereas players actively sought to differentiate themselves from their in-game avatars when playing competitive games (Trepte and Reinecke 2010)

Hefner et al.'s research into video game player enjoyment acted as an avenue to investigating player identification as well. They determined that the two keys integral to a player's capacity for identifying with a game character and inhabiting their role in the world were a strong narrative context to paint the possibilities available to them and

characters with which they can interact, creating virtual social experiences by which to bring their in-game character to life (Hefner, Klimmt, and Vorderer 2007).

Para-social Relationships.

In their general evaluation of media communications, Konijn et al. stated that people communicating across media tend to use identical social tools as they would in ordinary in-person interactions such as the use of eye contact, gestures, and body language to express themselves (Konijn et al. 2008). To elaborate on the use of digital media to form relationships with virtual personas, Kowert et al. studied the manner in which online chat rooms were used by emotionally sensitive individuals. According to their study, these people used the spaces differently than other people do: rather than using it as a simple way to connect with previously existing friend in the real world, emotionally sensitive individuals were expanding the range of their social circles directly through interaction with other people online (Kowert, Domahidi, and Quandt 2014).

Possibilities for Exploration

The Need

How Players Have Communicated. Video games, as an extension of digital communication media, have a similar capacity to enable para-social relationships that foster new personal connections. Customization of a virtual identity and the embrace of a new virtual world can give people the opportunity to explore new sides of themselves and connect with people in ways they couldn't before. Games have a long history of enabling these novel interactions through a variety of means, including voice and text chat,

gameplay interactions (Latif 2010; Nauert 2016), and sharing user-generated content socially ("The Evolution of Virtual Worlds, Part Three. User Generated Spaces" 2016).

Gamers have been using tools for communication across games for extended periods. Several online games even natively include in-game text chat ("Social Interaction in MMORPGs" 2016). Expanding upon that with 3rd party applications that introduce not only text, but voice chat as well is a common method for gamers to speak with one another. Newer applications like Discord even offer consolidated services that unify the features of other applications and allow people to form their own communities based on specific games ("Discord - Free Voice and Text Chat for Gamers" 2016).

Many games have innovative methods of allowing for communication between players in multiplayer experiences as well. Journey, a PlayStation 3 game, allows players to use various "chirps" to signal and interact with one another as they encounter other players in the desolate game world (Varanini 2012). Other games, like Hearthstone, Blizzard's free online trading card game, give players the option of sending predefined messages to one's opponent relevant to the gameplay. The application even simulates one's deliberation regarding what cards to play by highlighting on the other player's screen what cards in your hand you hover over with your mouse (Rockholz 2014).

One of the most famous games of the decade is Minecraft, a phenomenon well-known for its open policy towards the redistribution of "modded" content for their game. Players are free to create content using the application and then share that content with other players, encouraging people to devise architectural feats like building Baylor University (Matt Tinsley 2016), artistic feats like 3D modeling ("Zori's 3D Weapons" 2016; "Minecraft 3D Models" 2016), and even technological feats like building full-

fledged computers within the application ("Tutorials/Redstone Computers" 2016). Games of this sort make it easy for players to create novel content that they can actually use to communicate with other players and share ideologies (Lastowka 2016).

Kindling New Research

What Can Still Be Done. To explore the possibilities of additional modes of communication through video games, it seems prudent that the narrative space responsible for building up a sense of presence and identification in a fictional, virtual environment be investigated as a medium of communication itself. To that end, what follows is a description of an experimental study concentrated around person-to-person indirect communication through a game's "narrative space," i.e. the combination of personified and environmental virtual entities in the "space" inhabited by video game player avatars. In the study, players engaged in an ethical discussion with Non-Player Characters (NPCs) that "remembered" them and later communicated their ideas to third-party human players in a different narrative context. The study then tested these other players' understanding of the original player's ethical ideas to determine if they could accurately be reproduced.

Requirements for Verification. For developers to know whether this is possible, two truths must hold up to testing. The first requirement is that games must be a capable medium for observing values exhibited by players through behavior. Without this requirement, it would be impossible to verify whether the information input into a game by a user can be effectively introduced and maintained.

The secondary requirement is that games must be capable of conveying these concepts once stored, i.e. they must be effective tools for relaying values from one source

to another. This aspect, if confirmed, would suggest that any information a game is provided with by a player, regardless of its nature, could potentially be re-communicated outwardly towards other players.

     Previous Psychological Research. Professor of Ethical Leadership at NYU Jonathan Haidt is a social psychologist who proposed a Social Intuitionist model of interpreting moral judgment. This model assumes that people are influenced by their social environments to derive intuitions on how one should morally think, rather than relying on logical reasoning ("Jon Haidt's Home Page" 2016; "Jonathan Haidt" 2016). This line of thought was later expanded into Moral Foundations Theory in which Haidt identifies six categories or forms of moral thinking, each a spectrum of thought. The categories are Care/Harm, Fairness/Cheating, Liberty/Oppression, Loyalty/Betrayal, Authority/Subversion, and Sanctity/Degradation ("Jonathan Haidt" 2016).

     The original intent behind the development of Moral Foundations Theory was to explain the reason for the existence of strong differences in various cultures' sense of morality. In the process of testing the theory with live data, however, Haidt and his team discovered that the theory was a credible source to explain the differences between people's political thought as well. In U.S. politics, the "liberals tend to endorse the Care and Equality foundations, whereas conservatives tend to endorse all six foundations more equally" ("Jonathan Haidt" 2016).

     Psychological Application. Due to its success, the Moral Foundations Theory was leveraged as the psychological basis for conducting the research study that forms the subject of this thesis. The study measures two groups' interaction with an interactive story game in which the story's scenarios are meant to capture the essence of questions

derived directly from an approved Moral Foundations Questionnaire (MFQ). The idea

was that players could submit their moral intuitions to the game, the game would in turn

report these moral intuitions to another player, and each player would then take the

official MFQ, comparing each players' narrative-form response to their response on the

MFQ. The closer the recorded values, the more likely it is that the first player was able to

successfully use the game as a medium of communication for ethical information to an

unknown second player.

CHAPTER TWO

Materials and Methods

To conduct this experiment, a pair of simple interactive fiction games were developed offering a simple interface for the presentation of a narrative context to each potential group of users: those providing an input to the narrative context and those extracting information from the narrative context.

Study Components

Program Design

Distribution Methods. The experiment itself was conducted through a combination of online surveys and Twine webpages. Twine is a tool well-known in the interactive fiction community for making the creation of interactive fiction stories exceedingly simple (Klimas 2012, 2). By linking narrative passages together via hyperlinks, the Twine engine presents users with a story piece by piece as they navigate along pre-designed paths towards the story's conclusion.

Response Filtration. The participants, college students between the ages of 18 and 25, were free to access the study from the Internet. A subset of students was able to take the study for extra credit while the remainder of students merely volunteered. A total of 138 students submitted responses. Of that number, 50 successfully progressed all the way through.

Each player was asked questions that disqualify their inclusion in the final data set. For players of the story-input condition, they were asked whether they felt that they could express themselves accurately. If they responded in the negative, then their responses were invalidated and removed as well as whichever response from the story-extraction players were paired with them. 9 story-input players fell into this category.

Likewise, the story-extraction players had a survey question asking whether they felt that they had a good understanding of the ethical ideas held by the character in the story. If they responded in the negative, then their response would be removed along with the retroactively removed story-input paired response. 7 story-extraction players fell into this category. The remaining number were simply response attempts that did not finish the entirety of the study.

The participant proceeded through webpages in the following order: a consent form, a demographic survey (to gather information on experience with games), the Twine story to which they were assigned, and a corresponding post-survey (to gather information about their experience with the story they went through).

Narrative Content. Two stories were written and implemented for players. The first was given to 78 of the participants (the story-input players) and cast them as someone who wanders into a karaoke bar and has a sudden conversation about loyalty with some of the regulars. The second story, provided to the remaining 60 participants (the story-extraction players) and offering a linear non-interactive plot, cast the player as a detective investigating a murder. The story-input player's character is a person of interest in the case and, as a detective, the story-extraction player questions the bar regulars about the first player. The regulars then convey the first player's statements to

the second player, contributing to their understanding of another human player's thoughts on loyalty.

Communication Content Design

    Psychological Foundation. As previously stated, the study employed the use of a psychological questionnaire based on Jonathan Haidt's "Moral Foundations Theory" ("Home | Moralfoundations.org" 2016). The MFQ has questions divided into distinct categories, each providing a different sort of insight into the moral perspective of the tested person ("Questionnaires | Moralfoundations.org" 2016). To simplify matters, the video game study used only a subset of the questions pertaining to one of the six categories: Loyalty. Specifically, three questions (from two MFQ sub-categories) were used, each expecting a 6-point Likert scale response. The questions are displayed for clarity in Table 1.

Table 1: For each question on the right, participants supplied a 1-6 Likert scale response ranging from "Strongly Disagree" to "Strongly Agree."

Category 1: When you decide whether something is right or wrong, to what extent is the following consideration relevant to your thinking?	1) Whether or not someone showed a lack of loyalty.
Category 2: Please read the following sentences and indicate your agreement or disagreement:	2) People should be loyal to their family members, even when they have done something wrong.
	3) It is more important to be a team player than to express oneself.

    Question Design. In order to have multiple passes at acquiring data for any given MFQ question, a pair of multiple choice scenarios were presented to the participant for each representative MFQ question. For example, in the case of "People should be loyal to

their family members, even when they have done something wrong," two scenarios were presented. The first was to question the player directly as to whether they would help out a family member if that person were in trouble with the law. The second scenario pertinent to this question first suggested that the community of people within the narrative were like a family to each other. It then asked the player whether they would make a similar sacrifice for the sake of someone they valued with such a strong connection. Each pair of multiple choice scenarios were designed with the intent to elicit similar trains of thought in the player as they would if they were to simply take the MFQ. The corresponding excerpts from the associated stories are displayed in Tables 2 & 3 as an example of the narrative context replacement in action.

Question 2a: Jonas piped up, "I think we should be focused on something close to home if we're to talk about loyalty. After all, relationships at home are usually the strongest ones, right?"   Angela then chimed in as well. "Oh, yes, definitely. I could see myself pitching in for family under almost any circumstance."   Then James said, "I feel like there's a limit to that. I mean, if my family were in trouble with the law, then I wouldn't have so much loyalty to them."   "What do you think Roger?" said Angela."
Likert 1 (Strongly Disagree) Response: Heck no! Just because family is on the wrong side of the law doesn't mean I need to be too.
Likert 2 (Disagree) Response: I'm not interested in going to prison, though I would feel for them.
Likert 3 (Slightly Disagree) Response: That's tough. I'd feel bad, but I feel as though I wouldn't get involved.
Likert 4 (Slightly Agree) Response: I guess I would support them, but I wouldn't feel entirely comfortable about it.
Likert 5 (Agree) Response: I would definitely help my family, because I trust them.
Likert 6 (Strongly Agree) Response: I will always put my family before anything else, no matter what they may have done.
Question 2b: "You know, everyone here is kinda like a family. Everyone has circled around the karaoke contests and community. If those [favored singers] were in trouble, I don't know what I'd do with myself. I'd wager anyone here'd risk something of themselves to protect them. If anything has loyalty, it's this bar."   "I'll admit that most everyone here adores them," said James, "and I like 'em too. But I'm not gonna risk my neck for them. That crosses a line, my friend."
Likert 1 (Strongly Disagree) Response: Even further than that, James, it's completely senseless to take any sort of risk just for the sake of preserving a sense of 'loyalty' towards another.
Likert 2 (Disagree) Response: I agree with James. You can certainly take it too far.
Likert 3 (Slightly Disagree) Response: I don't think I would wanna take much of any risk, but I would still be vaguely concerned about the well-being of the person in question.
Likert 4 (Slightly Agree) Response: I'm not entirely sure. I certainly would prioritize my relationship with the other, but put myself at risk...it depends on what it would be.
Likert 5 (Agree) Response: Given the situation, there's a very good chance I'd wager my well-being for the sake of being loyal.
Likert 6 (Strongly Agree) Response: I would have no problem risking myself if it meant I could prove my loyalty to a loved one. If it were important, I'd sacrifice anything.

Table 3: A sample re-iteration of Player A's responses to Player B. Assumes each response associated with the addressed MFQ question is the lowest possible Likert scale emulation.

Player B's Corresponding Excerpt Assuming 1 / 1 Responses:

"How about his family or friends? Did he discuss them with you?" you ask.

"Oh," Angela became excited suddenly, "well, while he didn't talk about his family specifically, he did mention some things about taking risks for the sake of relationships. We talked about it during our loyalty discussion. Let's see, he said..."

"He said, 'It's completely senseless to take any sort of risk just for the sake of preserving a sense of loyalty towards another.' to be precise."

"Did he now?" said Branson.

You motion for Branson to resume taking notes. "Can you tell us more about that?"

"Later on," explained Angela, "we debated what we would do if someone important to us was in trouble with the law." She then looked to James.

"Yes, and at that, he said, 'Heck no! Just because family is on the wrong side of the law doesn't mean I need to be too.' And I definitely think he meant it." Angela and Jonas nod in agreement.

As can be seen, each set of choices gave the player six options to choose from where the tone of each option could be ordered on a spectrum akin to the Likert scale. For example, each scenario had at least two extreme positions on either end of agreeableness, two moderate options, and two very light, "on-the-fence"-type options to simulate varying states of agreement. Efforts were therefore made to ensure that participants' responses emulated an actual response to the MFQ as much as possible while simultaneously presenting the questions in a narrative context.

CHAPTER THREE

Results

Experimental Design

Analysis Technique

    Response Organization. Information gathered from the study was originally in the form of three separate sets of Likert data: the MFQ responses of Player A in their post-game survey (PostA), the in-game responses of Player A emulating those questions (GameA, equivalent to GameB, the responses reported to Player B in their story, hereby referred to as "Game"), and the MFQ responses that Player B entered in their post-game survey (PostB).

    Data Transformations. Because the primary interest rested in the effectiveness of communicating from PostA to PostB through Game, additional data was calculated from the initial set. The absolute values of the differences between each pairing (PostA-Game & Game-PostB) were calculated to give an indication of how accurately the participants were able to reproduce in the second portion the results of the first portion. It was also pertinent to record the effectiveness of the Game questions related to the same MFQ question in capturing the same information. Therefore, the same absolute values of the differences between the pairings were captured for all 6 Game questions (Q1a-Q1b, Q2a-Q2b, & Q3a-Q3b).

A second calculated data point was the frequency with which secondary halves of the responses resulted in oppositely agreeable scores. For example, there were data entries in which the PostA question received a response ranging from Likert values 1 to 3 (a "disagree" statement) and the paired Game response was a value ranging from 4 to 6 (an "agree" statement). It could be said that a switch in agreeableness polarity is a much stronger indication of difference than are changes in the degree to which one aligns oneself with a singular polarity. Therefore, this frequency is a valuable consideration in evaluating the degree of equality between each player's understanding of the content.

Data Report

Data Construction

For each question pairing (6 for PostA-Game, 6 for Game-PostB, 3 for the Game's MFQ question-pairs), descriptive statistics of their absolute value differences were generated. Outliers from those data sets were then filtered out before generating final descriptive statistics. This was done by doubling the standard deviation, adding it to the mean, and comparing that sum to values in the data set, removing any entries for that particular question that exceeded it.

Presentation. The final descriptive statistics are displayed in Table 4 below.

Table 4: Statistics over the Absolute Value Differences between 4 categories of responses: Player A's survey and their Game experience, Player B's Game experience and their survey, the pairs of questions within the Games, and the cumulative evaluations of each of the previous categories. Subdivions occur first at the Categorical level (AG/GB/GG), then at the MFQ level (1/2/3), and then at the individual question level (a/b). "Flips" are instances where the old and new responses lay on opposite sides of the Likert scale. Bold items are values in the upper quartile.

Absolute Value Difference Comparison	Min	Max	Mean	Median	Std Dev	Flips
MFQ1::PlayerAvsGameQuestion1	0	3	**1.042**	1	0.859	**17%**
MFQ1::PlayerAvsGameQuestion2	0	3	**1.125**	1	0.797	33%
MFQ2::PlayerAvsGameQuestion1	0	4	1.500	1	1.251	**25%**
MFQ2::PlayerAvsGameQuestion2	0	3	**1.167**	1	0.868	35%
MFQ3::PlayerAvsGameQuestion1	0	3	1.304	1	1.020	**15%**
MFQ3::PlayerAvsGameQuestion2	0	3	1.261	1	0.915	36%
MFQ1::PlayerBvsGameQuestion1	0	3	**0.870**	1	0.869	**9%**
MFQ1::PlayerBvsGameQuestion2	0	2	**0.870**	1	0.626	**13%**
MFQ2::PlayerBvsGameQuestion1	0	4	1.833	2	1.204	35%
MFQ2::PlayerBvsGameQuestion2	0	3	1.500	2	1.022	45%
MFQ3::PlayerBvsGameQuestion1	0	3	1.459	1	1.103	**20%**
MFQ3::PlayerBvsGameQuestion2	0	4	1.292	1	1.122	36%
MFQ1::GameQuestion1vsGameQuestion2	0	2	**0.708**	1	0.55	**8%**
MFQ2::GameQuestion1vsGameQuestion2	0	4	1.292	1	1.233	**10%**
MFQ3::GameQuestion1vsGameQuestion2	0	3	1.304	1	1.063	32%
PlayerAvsGame	0	4	**1.232**	1	0.958	**17%**
PlayerBvsGame	0	4	1.310	1	1.053	33%
GameQuestion1vsGameQuestion2	0	4	**1.099**	1	1.016	**25%**

Data Examination

Categorical Effectiveness. Given that the maximum difference that can exist between Likert data of this sort is 5, the upper quartile mean threshold is 1.25. Player A's mean passed through this threshold 50% of the time while Player B's mean achieved the same 33% of the time. The majority of the medians, however, are 1, meaning that means that are further from the upper quartile threshold are likely so only as a result of less common, but more extreme distances from the norm that have a disproportionate effect on the mean calculation.

MFQ Effectiveness. In addition, a clear difference can be seen between MFQ questions when examining the ranges of the mean and standard deviation. Translating

Player A concepts into the story for question 1 were very close to 1.0 while Player B's extraction of those concepts had an average below 1.0, indicating an efficient translation through the narrative with a preference for extraction.

In comparing the averages of their respective means, one can see that questions have varying levels of effectiveness as well, with MFQ1 at 0.977, MFQ2 at 1, and MFQ3 at 1.329. In examining the questions' comparison to their internal pairs in the game, MFQ1 can also be seen to stand out from the other two with far more similar scores (0.708 vs. 1.292 and 1.304).

Individual Question Effectiveness. Another key element of the analysis is how questions appear to have tendencies not only between MFQ questions, but also internally between pairs associated with a given MFQ question. Concerning MFQ 1, question 1 and question 2 tended to have similar scores. However, in MFQ 2 and 3, question 1 was consistently much higher than question 2. This supports the theory that individual questions can have different levels of translation effectiveness.

CHAPTER FOUR

Discussion and Conclusions

On The Data

Question Evaluations

Data-Supported Implications. The fact that individual questions had a tendency to perform uniquely indicates that the context around questions as well as the manner in which those questions are phrased, i.e. aspects associated with the question's narrative representation, have a significant effect on the question's recorded translation effectiveness.

If this were accurate, then it would stand to reason that a number of factors could influence the ethical translation potential of video game scenarios, including an increase in the narrative context's immersion and a refinement of the phrasing used to deliver the ethical content.

MFQ Performance Differences. The differences between MFQ questions' performance could be the result of certain questions focusing on a topic that has more clearly defined lines of loyalty associated with it. For example, it is easier to evaluate one's opinion on "is betraying someone forgivable?" than it is to do the same for, "Would you be willing to sacrifice for the sake of someone you care about?" (as was the case for MFQ1 and MFQ2). The latter question has far more unknown variables associated with it: "Who am I sacrificing for?", "How am I sacrificing and how bad is it?", etc. The

former question in comparison has only one axis of contemplation, e.g. "How badly did they betray me?"

Additionally, there is a possibility that people have less experience confronting the latter question (for example, if they've never had to sacrifice anything significant for a loved one) whereas most people have experienced some form of betrayal in their life time. Those who have experienced a confrontation with the latter question are more likely to state how they actually think on the topic and are more likely to better empathize with the "character" in the story. They would therefore likely be better at predicting how the character would respond, given the character's in-game testimony.

Potential Sources of Error

Some of the questions failed to enter the upper quartile. In particular, "MFQ2::PlayerAvsGameQuestion1", "MFQ2::PlayerBvsGameQuestion1", and "MFQ2::PlayerBvsGameQuestion2" each had an absolute value difference mean of 1.5 or more, indicating that the question presented in the narrative and its associated responses were poor adaptations of the Moral Foundations Questionnaire's analogous questions (referenced in Table 1).

Narrative Causes

Poor Choice Design. Of the 104 participants that fully completed the study, nearly half of them (51%) needed to be thrown out due to data-corrupting assertions in the surveys. For example, some Player A participants indicated that they could not convey their desired thoughts while some of the Player B participants stated that they did not feel as though they understood the thoughts of the character they were investigating.

Although the former *may* have been something they would have experienced regardless while answering the original MFQ questions, it is entirely likely that the presentation of the questions in narrative format could have triggered these reactions. In that case, the questions used in this study may not have been sufficiently designed for the participants' optimized understanding.

Another consideration is that the responses themselves were unclear when taken out of context and provided to Player B. When conveying the initial players' responses to the second player, the entire context of the response cannot be dropped into the story suddenly (or at least, the game would feel unnatural if that were to happen). As such, the story-extractor's awareness of the context of a response is technically limited and can damage the study designer's intended connotation or interpretation for when reading the response. This possibility also appears to be likely due to the number of recorded survey responses stating that participants were confused by something the first player had supposedly said (49%)

Narrative Depth. One potential reason for the non-upper quartile results may be that the narrative content itself was not long or engaging enough to stimulate players' desire to invest their imagination in the story and engage with the characters. Based on prior research, a reciprocal relationship exists between interactivity, presence, identification, and engagement. The lack of a fully interactive story with an expansive and intriguing lore to explore (as is typical for hyperlink-based interactive fictions of this sort), or in other words, the lack of interesting *interactions* may have led to a loss of engagement and with it, presence and identification.

Without presence, the player can't be expected to provide accurate responses that match the context of the world around them. Without identification, players are less likely to role-play who they think they are. While the background information for the first story's protagonist was intentionally left vague so that players could fill the role with their own ideas and background, the fact that the character is named independently, may have led to players failing to sufficiently associate themselves with the character they controlled. The subsequent dissonance could have influenced their responses differently than they would have without the narrative context, i.e. when comparing it to their original MFQ scores.

Technical Causes

Evaluation Complexity. Another reason the results may have been skewed is merely because of the vagueness and imprecise science of interpreting other people's thoughts on complex topics. Asking a player how someone would respond to a moral or ethical issue is by itself more difficult than asking them about something more direct and concrete such as descriptive details about what they said or did. Instead, this study jumped immediately into giving a secondary player a statement and asking them to interpret and re-apply that statement under a new context which is a much more difficult task.

<div align="center">

Suggestions for Future Research

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Narrative Suggestions

More Interactive Experience. A game experience that leveraged the medium more by fostering a sense of presence through stronger interactions with the characters

and environment may prove more successful at creating a harmonious and free narrative

space with which players can identify with. By strengthening that relationship, past

research suggests that players' embracement of the narrative space will improve,

hopefully removing the likelihood that their moral communication will become clouded

(assuming, of course, that the player is not role-playing an alternative moral agent).

Increased Play Time. Since the story was relatively quick and static

(approximately 15 minutes, minimal interactions with the environment and characters)

the level of engagement was likely low. However, the longer a narrative goes on and the

more it holds onto a player, the more engaged a player is likely to become. A potential

future study could explore the relationship between time spent as a character in a story

and how that influences their moral interpretations or actions in the short term.

Improved Narrative Design. The 51% invalidation rate is a strong indicator that

the in-game questions' narrative design could be improved. As such, future experiments

could have improved statement comparisons that avoid issues related to context

ambiguity, lack of moral agency in decision-making, and inter-question disparity.

Technical Suggestions

Simplified Design Construct. As previously stated, the complexity of the task

itself may have resulted in the fundamental task itself being hard to do. Since the current

study failed to adequately account for this possibility, future research could avoid this

mistake by first testing the communication of simpler information through narrative and

then following it up with more advanced topics and tasks.

Compare Reading Levels. Because the "game" extraction can more or less be

related to reading comprehension, it may be useful to compare the results to national and

international reading levels and design a story-game that can target the same audience as those exams are meant to test. In this experiment, the upper quartile of effectiveness was prioritized; however, if one could properly compare that a nation's reading scores in some way, the research would be able to give a better sense of the meaning behind the numbers recorded.

Conclusion

Games have developed at an astounding rate, and increasing pressure to deliver strong narrative experiences is now a critical component of industry standards. Much research has been done on the presence, identification, and para-social relationships evoked by interactive experiences like video games. Adding to this research community the notion that games can themselves be used as a form of communication between people through narrative showcases the potential for interactive stories to radicalize players as participants in the creation of narrative, both by contributing to the shared narrative that others experience and by allowing themselves to indirectly connect with their fellow gamers.

The study disclosed in this paper confirms that this sort of narrative-embedded player interaction is highly plausible, even with the vague and interpretive, yet sophisticated content used in the study such as concepts of morality and ethics. Video game researchers are therefore encouraged to delve into this realm of study should they deem its potential applications valuable to the development of the game industry and beyond.

Potential Applications. Hitherto now, the only way for players to join the creative side has been for them to become developers themselves or join a "modding" community

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in which they add, remove, or edit the content of existing games to create plugins that change the gaming experience (perhaps by adding a new quest, character, weapon, etc.).

Based on the study, it would be entirely possible for player interactions with a shared narrative world to allow for a game where players and NPCs interact with and remember each other equally, translating knowledge across each game client. In fact, an entire "rumor" system for NPCs would be possible where characters, player or NPC discuss player and NPC ideas homogenously, making a simple stroll through the game world both immersive and socially educational about the other players and their ideas.

Even more impressive would be the capacity for a game to maintain a virtual representation of the player character whenever they are not actively playing. By understanding the values associated with player actions and decision-making, players could come across other pseudo-players that interact with the world in the living player's stead, possibly even having whole character interactions with this phantom character. The potential use of this construct in generalized sociological simulations and political or economic analysis is also a crucial possibility to consider.

The Future. Given the intensely revolutionary potential for this research, it is imperative that researchers investigate the proper application of this study and its implications if they pursue a future in which human players have a more involved role in the development of interactive stories. Important to consider also, however is the equal potential for this technology to be used for the manipulation of people and their relationships with others across virtual spaces. Games are the new medium on the block and as such require the attention of the research community to ensure that they are developed both expertly and safely.

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