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AN INTERACTIVE EVALUATION OF A PLAYER TYPE MODEL

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ABSTRACT

AN INTERACTIVE EVALUATION OF A PLAYER TYPE MODEL

By

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Developing interactive video games is a difficult and time consuming process. To facilitate this process, game designers need a high level model of what gamers want and how to provide it to them. One design approach is to use "player types" – a construct that groups individuals based on their motivations and desired game features. By understanding these groups, a game designer can be more focused and efficient in their production process, which in turn should produce a more entertaining game. However, effectiveness of player types has not been evaluated. Is a game constructed with player types in mind more "fun"? To answer this question, a simple game was designed with multiple variations, each tailored for one for each of six player types. Before playing the game, game players were asked a series of questions to determine their player type. The game randomly assigned players to one of two groups. The first group played a game variation suited to their player type. The second group played a game variation that did not match their player type. After playing the game, players from both groups evaluated their experience. Comparing experience from both groups yielded a quantitative evaluation of effectiveness of player types in game design.

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Introduction

Background

The digital gaming industry is booming. In 2007, sales of console hardware, software and accessories totaled $18.8 billion (The NPD Group, 2008), an increase of 43 percent from the previous year. This massive figure does not include sales of mobile, PC, or subscription games. One subscription game, World of Warcraft, had over 10 million players in 2008 (Blizzard, 2008a) paying between $13-15 per month (Blizzard, 2008b).

The video game market has also grown beyond the stereotypical social male loner living in his mother's basement playing ultra-violent "shooter" games. People who play video games have increasingly diverse backgrounds and expectations. One example of this is the rise in women gamers: according to the Entertainment Software Association (2008), women now comprise 38% of the gaming market. Video games are also being used for non-entertainment purposes such as education (Prensky, 2004; Gee 2003; Squire K. D. 2004; Steinkuehler, 2004), therapy (Wiederhold, B.K. Wiederhold, M.D., 2006), and interactive drama (Magerko, 2005; Mateas M. and Stern A., 2003; Murray, 1997) . People who have grown up with games are called the "gaming generation" (Beck and Wade, 2004). Games are a growing, cultural force to be reckoned with.

What is it about video games that make them so popular? Why do certain people play certain games? How can game developers understand their audience better to create better games? With a growing market and diversifying audience of gamers, it is

increasingly important for game designers to understand gamer motivations and what game features best satisfy those motivations. Why focus on creating a game with photo-realistic graphics if the primary audience is mostly interested in socializing? A framework of video game player behavior will allow game designers to focus their energies on what is essential to their audience.

Game Motivations

A common method of understanding game players is through simple demographics. For example, several studies have examined why women play games. Yet demographics fail to capture the diversity within demographic groups.

Both academics and game developers have proposed more refined game player motivations. Two game developers, Klug and Schell (2006), formulated a list of player motivations based on their experience as game developers. The motivations they discussed were competition, exploration, collecting, achievement, fun, directing (being in charge of others), story, performing (showing off to others), problem solving, construction, control, and escapism.

On the academic front, Bartle (1990, 1996) was one of the first researchers to examine player motivations. He began his work during the eighties studying MUDs (multi-user dungeons), ancestors of modern MMOs. At the time, MUDs were primarily online fantasy games of monster hunting, treasure hunting, and trading goods (Whang, 2003). Following an approach that parallels the uses and gratifications paradigm in communication studies (Palmgreen, Wenner & Rosengren, 1983), Bartle found four principle dimensions of playing motivations: achievement, exploration,

socialization, and domination of others[1] (usually through killing or harassing weaker players). He grouped MUD players into groups called "Player Types" based on these motivations.

Bartle then described the interaction between these groups within the MUD. For example, he observed that dominators can poison the social atmosphere and decrease the number of socializers within the game. Bartle's "Player Types" and their interactions have been used as a model of player behavior in the design of commercial MMO games such as Star Wars Galaxies (Squire, K. D. & Steinkuehler, C. A., 2006). Others have followed in Bartle's footsteps and developed different sets of motivational dimensions after analyzing players from other games (Yee 2004, Yee 2005b, Whang 2003).

Others have incorporated a more theory based approach. Uses and Gratifications is model of human behavior that has been used to explore player behavior (Senlow, 1984; Wigand, Borstelmann, & Boster, 1985; Vorderer, Hartmann, and Klimmt 2003). Recently Sherry et al. (Sherry, Lucas, Greenburg, & Lachlan, 2006) used this paradigm to construct a model of player motivation to predict game usage and preference. They found that arousal, challenge, competition, diversion, fantasy, and social interaction were principle motivations for video game players. Other recent uses and gratifications studies (cf. Griffiths, 1991; Phillips, Rolls, Rouse, & Griffiths, 1995; Vorderer, Hartmann, & Klimmt, 2003) include motivations such as "to pass time", "to avoid doing other things", and "to cheer oneself up."

Similarly, flow states (Csikszentmihalyi, 1990) have been proposed to have a unique, direct effect on video game usage (Sherry, 2004). Under this model, exposure to

[1] Domination was usually achieved through killing or harassing other players. Bartle referred to such players as "killers."

video games is an intrinsically rewarding experience in which video game players try to achieve a highly engaging mental state that is characterized by both enjoyment and a sense of timelessness. One of the essential prerequisites for attaining a flow state is a balance between the challenges offered by a video game and the player's skill. This balance can be achieved through good game play balancing and is sometimes optimized through inbuilt "skill levels" or other adaptive features.

Each of these outlined theories highlight specific aspects why people play video games and there is obviously considerable overlap. However, from the game designer's perspective, many of these motivations are complex, abstract concepts that are not typically envisioned when you ask someone "What makes that game fun?" More importantly, game developers need more than motivations – they need a model that maps game motivations to specific game features.

Cognitive Model of Game Playing

Weber and Shaw (Weber, R., & Shaw, P., 2007) recently offered a new theoretical model of video game player behavior entitled, "Cognitive Model of Game Playing" (CMGP). The CMGP views player behavior as being more complex than just motivations and includes other factors:[2] self-efficacy, self-regulation, biology, and prior experience. The role of prior experience in CMGP is particularly important – based on one's experiences, one builds expectations to guide future behavior. Within CMGP, video game players define their prior experiences through their evaluation of game

[2] Some of the motivations presented by other models are similar to these new factors. For example Klug and Schell's (2006) control motivation is similar to the SCT incentive of status and the CMGP concept of self-efficacy.

features.[3] The evaluation of game features guides the player's decisions on future game playing behavior. If the game features contributed to a positive experience, then the player will seek out those game features in the future. Because the CMGP provides a roadmap between motivations and desired game features, it is potentially very useful to game designers[4].

CMGP is built from Bandura's (1986) Social Cognitive Theory (SCT). SCT is a general theory of human behavior that has been applied to both the internet and mass media in general (LaRose & Eastin, 2004; Bandura, 2001). Similarly to LaRose and Eastin, CMGP follows SCT's basic assumption that behavior is determined by one's expectation of certain outcomes. These expected outcomes are formed by either direct or vicarious experiences. Through these prior experiences, one learns that certain behaviors produce emotional or cognitive outcomes. Elements of these experiences are encoded into symbolical representations that can be applied during future experiences.

In terms of video games, people learn that playing games have certain emotional and cognitive effects. They digest their experience into symbolical representations that may include many elements, ranging from the game itself, the environment around the game, etc. CMGP focuses primarily on symbols related to the game itself (game features) and how they meet the player's emotional and cognitive desires.

In SCT, there are six basic, theoretically derived incentives for human behavior: self-reactive incentives novelty, social, status, monetary, and enjoyable activity (Bandura,

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[3] Weber refers to these elements of prior experiences as game qualities. To some "quality" implies a normative evaluation, which was not Weber's intention. To avoid confusion, I use "features" instead of "qualities."

[4] Of course no model is not recipe on making the perfect game or is it a substitute for creativity. Rather, models are only guides to help game designers selectively focus their efforts.

1986, pp. 232-240). CMGP further sub-divides the SCT incentives based on whether the incentive is targeted at one's self, other, or the game. For example, for status, one may try to get a good score as source of personal pride, to beat one's friends, or to simply master the game itself.

Although the motivations between SCT and other models are not the same, there is considerable overlap. For example, comparing to Bartle and SCT, the social motivations are the same. Bartle's achievement and exploration factors correspond to SCT incentives of status and novelty. Bartle's "killer" is driven by power and infamy, and is thus understood as combination of SCT status and social motivations. Similar comparisons can be drawn with other models.

An important aspect of SCT is that people can regulate their actions and mood. This self-regulation has four parts: self-monitoring, judgment, self-reactive incentives, and self-efficacy. Self-monitoring is the capacity to be aware of one's self and actions. Generally, this self awareness is used to evaluate the outcomes of behaviors – what is my state and what am I doing that may be affecting that state? However, one may engage in activities that suspend self-monitoring to pass the time or partially to escape from a stressful situation. Judgment is an evaluation of behavior compared to personal and social standards. That is, I may choose not to play "Barbie Horse Adventures: Wild Horse Rescue" because, being male graduate student in his thirties, that would be viewed as "unusual" or "weird" by social standards. Self-reactive incentives are psychological motivations for maintaining personal or social standards. In video games, there is an additional sub-dimension – the player is part of a fictional world that has its own fictional standards. In a role-playing game, the one may want to play a character whose personal

and cultural norms are different from their own. Finally, self-efficacy[5] is the belief in one's ability to successfully complete an action. In video games, self-efficacy takes three forms. One, if the player has difficulty using the game controller or understanding the interface, then the player would be less confident in his or her ability to play the game. Two, if the game is too hard, then the player will become frustrated and stop playing. Finally, the player needs to feel that they can accomplish their goals within the game world. For example, if a player feels strongly about exploring a mountain range within the game, but the game does not allow the player do so, the player may feel discouraged from playing the game in general.

As mentioned in SCT (Bandura 1986, p. 153), biological factors also contribute to one's overall behavior. The CMGP includes biological factors through temperaments, which are defined as "... biologically rooted individual differences in behavior tendencies that are present early in life and are relatively stable across various kinds of situations and over the course of time" (Bates, 1989, p.4; see also Sherry 2001). Sherry (2001) showed that temperament was a consistent and causal factor in forming television use motivations. Thus, CMGP incorporates temperaments as additional factors that determine one's game playing behavior.

After developing this framework, Weber and Shaw constructed a two part study to evaluate this model. First, it was necessary to generate a complete list of game qualities. Weber and Shaw interviewed fifteen individuals that varied in gender and game experience to construct a list of video game features. Weber and Shaw grouped

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[5] Within SCT, self-efficacy is not part of self-regulation, but a separate concept. However, self-efficacy has a similar effect on behavior as self-regulation factors. For clarity, CMGP groups it with the other self-regulation factors

game features into a hierarchy system with the broadest features (graphics, sound, etc) in the top tier, and more specific features (graphics aesthetics, graphics style, etc.) into second and third categories. Next, using an online survey, game players were asked (a) about their incentives (SCT motivations, self-regulation, and temperament) and (b) to evaluate a recent game experience using the game qualities from the interviews.

Borrowing from Bartle (1990, 1996) participants were statistically clustered into groups or "player types" based on their behavioral incentives. Weber and Shaw then identified what game features were most important to which player types (see appendix A). Although Weber and Shaw lacked a large enough sample to tie the more specific second and third tier game features to particular player types, they were able to use the broader first tier game features to explain a significant amount variation of game play time variation within the sample ($P < .01$; $F_{29, 166}$; $R2 = 27\%$).

Because this model incorporates game motivations, self-regulation, and biological factors, and then ties them to game qualities, it is potentially very useful to game designers. The last remaining step is to prove its usefulness. Does a game designed with using this model produce a better experience for the game player?

Hypothesis

H1: Game players that play a game with first tier game features that matches their player type will have a better game experience than players who play game customized for another player type.

Within CMGP, people with similar incentives share game features that satisfy those incentives. Players who play a game that match their incentives should rate their experience better than those who don't. I focused on the first tier of game features (graphics, sound, etc.) because of limitations in Weber and Shaw's initial study.

Method

Participants

Participants were recruited from undergraduate classes at a Michigan State University. These students received extra credit in their respective classes for their participation in this research. Students were provided with a web link which allowed them to download the game and play it either in a computer lab or at home.

All of the participants were "gamers" - people who have played at least one video game in the last month. It is possible this definition of "gamers" excluded players with specific combinations of motivations and quality indicators For example, someone who was an avid game player but gave up playing video games because of the time demands of graduate school would not be classified as a "gamer". However, this definition of "gamer" was required in order for the participants to understand and adequately respond to the questions that are video game specific.

Procedure

A 2D game was built that involved rescuing crew members and cargo from a crashed space ship (see Appendix B). The game was programmed in such a way that specific game features (as defined by Weber and Shaw's study) could be programmatically adjusted to match particular player types (see Appendix C). The game contained a built-in survey engine and network features to transmit player survey responses to a central server. The game was constructed in Torque Game Builder and made available for Mac and Windows.

Participants visited a web site that contained download links for the Windows and Mac versions of the game. After downloading the game, participants unzipped the game

and ran it. Once on the game's main menu screen, participants had to take an initial survey before playing the game. This first survey asked about the participant's demographics, play motivations, and temperament.

Once the survey was completed, the game determined which player type most closely matched the participant's responses. Weber and Shaw's original study included a discriminate analysis of the player types and their motivational, regulatory, and temperament factors. This analysis generated a table of relative weights of how important each factor was to distinguish player types. For this study, the game calculated six player type scores for each participant. This score was the sum of factor scores multiplied by their corresponding player type's factor weight. The higher the resulting score, the more closely the participant matched the player type. The participant was assigned to the player type that had the highest player type score based on the participant's responses.

The game then randomly assigned the participant to one of two groups: player type matched and player type non-matched. Participants in the first group played a version of the game with features that matched their player type. Participants in the second group played a game with features that matched a player type different than their own.

The participants played the game for ten minutes. After ten minutes of game play, the game paused and asked participants to evaluate their experience. The responses were then transmitted and recorded on a server. The player could then continue to play the game if they wished, but could not change their evaluation.

Measures

When players start the game, they were asked for basic student information (so they can claim their extra credit), basic demographic information (age, gender, etc.), general game play information (how often do they play, what games do they play, etc.), and player type information. The player type questions are the same questions from Weber and Shaw's original study.

After ten minutes time, the player were asked a single seven point Likert-style questions about their game experience and asked to provide additional comments about the game.

Analysis

T-Test and univariate analyses were conducted using SPSS version 16.0 (SPSS, 2008).

Results

A total of 96 valid responses were collected. These participants were determined to belong to 5 of the 6 player types defined by Weber and Shaw. Butterflies were the most common (42.4%), and Competitors were not present in the sample at all.

Player Type	Frequency	Percent
Hedonist	9	9.1
Loner	31	31.3
Competitor	0	0
Butterfly	42	42.4
Leader	7	7.1
Follower	10	10.1
Total	99	100.0

Table 1 Frequency of player types with the sample.

A t-test was used to compare the differences in the experience ratings of 49 participants who played a game that matched their type and 50 participants who played a game that did not. On average, matched player types ($M = 3.75$, $SD = 1.45$) rated their experience better than the unmatched player types ($M = 4.06$, $SD = 1.49$). This difference was not statistically significant ($t = 1.03$, n.s.). These results do not support the hypothesis.

A univariate analysis of variance was performed to determine if there was difference in the overall experience between matched and unmatched players within player types. The differences on were barely significant ($df = 4$, $p = 0.053$). A plot of the estimated marginal means of this analysis shows that Hedonists and Butterflies enjoyed a version of the game different than their player type more than a version that matched their type. Loners, Leaders, and Followers preferred the game version that matched their type (see figure 1).

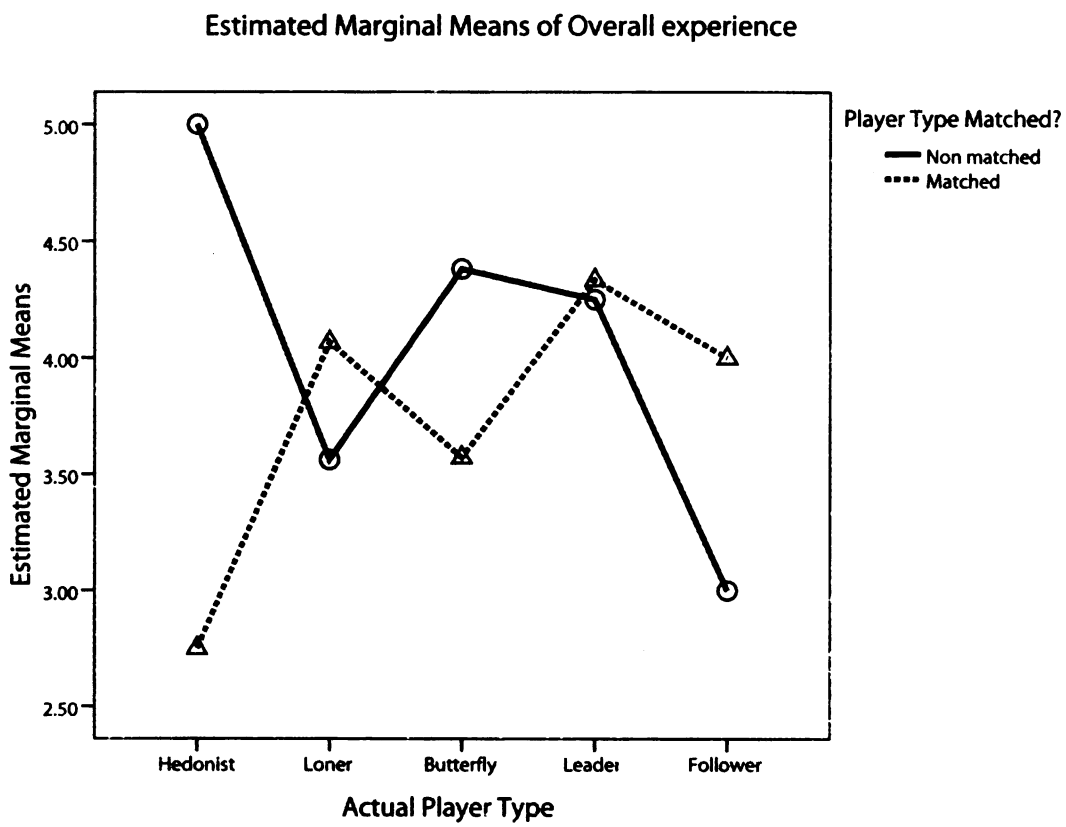

Figure 1 – A comparison of the differences in experience between different player types as determined by a univariate analysis of variance.

Discussion

The comparison of the experience of participants who played a matched and non-match game does not support the hypothesis. A subsequent analysis indicates that there may be a difference between groups when broken down by player type. However, difference isn't consistent among types. For example, Hedonists and Followers both have large differences between their marginal means, only in opposite directions. Loners and Butterflies exhibit smaller differences, yet again in different directions. Finally, the difference between the two Leaders groups is very small.

The lack of a clear direction on these results may be due in part to the study's design. Each game version varied player type related game features. In some cases, this meant simply including or excluding a feature. For example, the game customized for Loners and Competitors presented a story through character dialog. Other versions of the game lacked that story. In other cases, some features were muted or downplayed. For example, sound effects are important for Competitors and Leaders. It would be very unusual and distracting for a game to not have any sound effects. So for these player types, the sound effects were played at full volume. Other types heard the sound effects at half volume. Furthermore, its possible students may have tested the game on a computer that either has the sound muted or lacks speakers.

The inclusion or exclusion of a game feature may not be enough for a player who values that feature. For example, Loners value story in their experience. However, if players of this type hated the story, then it reasonable to expect that would have a strong negative effect on their overall experience. Since this study did not ask participants to evaluate individual features (such as story), it is not possible to control for player type relevant features that were disliked and thus negatively impacted the experience.

Furthermore, the magnitude of difference between features may have also confounded the results. Although sound volume was one of several features designed to appeal to Competitors and Leaders, was it strong enough to make a difference between the matched and non matched versions of the game?

It's possible that some participants played the game on a computer that lacked speakers or had the system volume muted. In this case, these participants would have not been exposed to the game features being tested.

In addition, within CMGP, the more detailed game features in the second and third tiers were stronger predictors of game play behavior than features in the first tier. However, Weber and Shaw's study lacked a large enough sample size to determine which of these features were important to the each player type. Further refinement of the Weber and Shaw's model may produce a more specific list of game features that better appeal to player types.

Finally, the game was designed to be played for ten minutes. This limited exposure may not have been enough for players to form concrete opinions on particular game features. A longer game time may produce clear differences between the groups.

Limitations

Participation for this study was voluntarily. People who choose to play the game may have different game playing motivations or quality evaluations than those who do not.

It is interesting to note that Competitor s were missing from the sample, especially since participants were recruited in a similar manner from a similar population and Competitor were 16.2% of the sample in Weber and Shaw's original study and. It is unclear what effect this absence had on the results.

Future Directions

Although the overall difference between groups was not significant, it is encouraging that the difference between player types was significantly different. Because the differences were not consistent among player types, however, further research is needed. A future experiment is being planned that will incorporate a) a longer

play time, b) stronger difference between game types, and c) a more refined measure of the player experience that includes the player's evaluation of individual game features.

Conclusion

Shaw and Weber demonstrated that the CMGP is a framework that can be used to understand how game players evaluated prior game experiences. Unlike other models of player behavior, the CMGP ties particular game features to groups of people. For this reason, the CMGP is potentially very useful to game designers. Despite flaws in the experimental design, the results of this study indicate the possibility that this model could possibility be used to focus game designer's energies on the most important elements to their audience. I am looking forward to revise and retesting this experiment to better determine its effectiveness.

APPENDIX A

Player types and their preferred game features.

Based on the participant's responses to the behavioral questions, Weber and Shaw used a cluster analysis to group them into six groups or "player types."

Hedonist

This player seeks enjoyable novel experiences with other people, but is not interested in competing with them or acquiring wealth. The player is interested in personal achievement and has the highest desire for control among player types. This player type is the happiest. Important game qualities: replaying with new goals, music, replaying as different characters, playing games with other people.

Loner

This player wishes for enjoyable experiences. The player wants to be in control and compete against other players. However, beyond the player's competitive standing, he or she type is disdainful of others think. Of all of the player types, this one has the lowest desire to socialize with other or value their opinions on his or her activities. This player type is also the most unhappy and possibly uses video games as means to cope with their bad mood. Important game qualities: game controls, replaying with new goals, player character, music, voice, game world.

Competitor

This player is primarily driven by achievement and competition. The player is not interested in new experiences or interacting with others. The player is more active, persistence, more rhythmic, and less flexible than all other player types. Important game qualities: game controller, non-player characters, music.

Butterfly

This active player type plays games primarily as a means to socialize with others, more so than any other player type. The player is disdainful of in-game goals, active, likes to be control, and generally is not aware of what how he or she is feeling. Important game qualities: non-player characters, replaying as different characters, sound.

Leader

This player type plays games primarily as a means to socialize with others. This player type seeks control and hates interacting with game characters. This player is more oblivious of their own actions and feelings than other player types. Important game qualities: replaying as different character, playing games with other people, sound.

Follower

This player type like to interact with game characters. This player type hates interacting with game characters (more than any other player type). Unlike the other socializers, this player type is very flexible, is somewhat inactive, and doesn't care what other people think of him or her. Important game qualities: game controls, player characters, playing games alone, game world/setting

APPENDIX B

Game design

High Concept

A band of ruthless space criminals, the Black Hole Pirates, has shot down the space freighter *Cuardach.* Before the ship was destroyed above a remote planet, it jettisoned its cargo and its crew fled in escape pods. As a member of the Galactic Ranger Expedition, it your job to recover the cargo and rescue the crew.

Space Wreck is a top-down action adventure game. The player pilots an upgradeable combat hovercraft on an alien planet. The players goal is to both rescue cargo and crew from the pirates.

Background

Space Wreck is set in a future time where humanity has expanded and explored the galaxy. Between the great "city-states" of the galaxy lie many sparsely populated star systems. On the surface, the city-states are fiercely independent and nationalistic. However, the differences between their cultures and political systems are largely cosmetic. Despite superficial autonomy, the city-states are largely guided by trans-galactic companies who encourage consumerism and materialism.

The few people who seek to escape from the mono-culture of the city-states settle in the "Frontier" – a term that broadly covers the sparsely populated star systems between the great city-states. These settlers include both idealists trying to build the next great civilization, harden criminals, and people simply seeking a little more freedom.

The Galaxy Expedition Rangers (G.E.Rs) are a paramilitary organization hired by a consortium of trans-galactic companies to act as both custodians and constables of these remote regions. Although the consortium does not see much value in the Frontier, many vital trade routes run through these regions.

The Black Hole Pirates is one group that preys on the cargo ships in the frontier. The pirates are branded as Class A Criminals by the GER. However, they view themselves as modern day Robin Hoods who are stealing from the rich companies and donating to the poor (which happens to be them!). The pirates have a famous appreciation for good food and wine.

Twenty years ago, one of the pirates, Russell Hammerhead decided to abandon his thieving and gluttonous ways to raise his daughter. Russell agreed to become a cargo pilot for "G-Mart," a large trans-galactic discount department store. However, before leaving, he helped himself to what he considered to be his fair share of the pirate's horde – a bottle of 10,000 year old Gamarian port. Ever since then, the Black Hole pirates have been searching for Hammerhead to recover this treasure.

Game Play

Space Wreck is a top-down action adventure game set on an alien forest at night. The player pilots one of several high tech, upgradeable hovercrafts. The player's overall goal is recover cargo and crew from a crashed freighter ship, the *Cuardach*.

The game is controled using a context sensitive, point and click interface. Clicking on an open area makes the ship move to that destination. Clicking on destructible targets (pirate drones, small rocks, etc.) makes the hover craft fire at that

target. However, the ship does not move towards the destructible target. It is possible to strafe or kite an enemy by clicking a destination and then clicking on the enemy. The player can collect cargo and rescue crew members by driving the hover craft near them. Finally, the player can interact with friendly crew members by clicking on them. The mouse cursor changes colors based on resulting action (see table 2).

Target	*Cursor Color*	*Click Result*
No target, path obstructed	Red	Nothing
No target, path unobstructed	Green	Craft moves to clicked destination
Crew members	Blue	Begins dialog with crew member
Pirate drones Small rocks	Orange	Ship turns and fires at target

Table 2 Summery of mouse click commands

The player competes against the pirate drones to collect cargo. The crew of the *Cuardach* wants the cargo so they can make their delivery. In addition, the cargo is radioactive and threatens the natural environment. However, the pirates are looking through the cargo for the port! Drones will try to destroy the player's vehicle by either firing on the player's ship or trying to ram it. If player's hover craft's shields are depleted, the player will be teleported to a safe location. In exchange for recovering the cargo, the crew of the *Cuardach* will let the player purchase upgrades for their hover craft.

As the player explores the different locations, the player will also discover escape pods from the *Cuardach*. Each escape pod contains a single crew member. Some of the escape pods are easy to find, some are hidden while others are being held hostage by

more powerful pirate drones. The *Cuardach* needs to rescue all of the crew members before it can be repaired and resume its journey.

The player wins the game when all of the cargo and crew members have been rescued.

Experiment related hurdles

This project's goal was to evaluating whether the CMGP is useful to game designers. It is important to note how using CMGP, especially within the confines of an experiment, affected the game's design.

Designing a game that emphasizes some features and not others is not a particularly difficult constraint. For example, while music is important to hedonists, sound effects are not. For hedonists, one can imagine a music/rhythm game. However, developing a game that caters to multiple player types with dynamically changeable features proved to be very difficult. The most obviously problem dealt with story. To cater to Loner player types, the game includes a brief cutscene and a series of dialog sequences that play out at certain locations on the game map, usually within the first two minutes of game play. The story acts as an in-game tutorial and provides context and background information to the game. Because incorporating story was both the hardest and most dramatic feature to implement, it was the first to be completed. The pacing of the game was designed around it.

When it became time to implement the non-story version of the game, several problems arouse. First, the story doubled as the tutorial. A brief dialog had to be added to the introduction of the non-story version of the game to explain the basic controls. Next, the pacing of non-story version of the game felt boring. While the story version

was broken up by dialog and interesting characters, the non-story version was left with uncomfortable gaps where little happens. Finally, the story version has more content (dialog, characters, etc.) than the non-story version which made it feel like a more professional and polished experience. It's not clear what player-type neutral features could have been added to the non-story version to compensate for this.

APPENDIX C

Experimental Game Features

Weber and Shaw's study enumerated 13 broad game features: A.I., controls, game characters, game setting/world, graphics, music, player characters, questionable content, replayability, socializing, sound effects, spoken dialog and story. Of these features, A.I., controls, graphics and setting/game world were identified as not being good features that could be included or not included in different version of the game. Furthermore, questionable content was not included because it may have potentially have offended certain participants. Socialization and spoken dialog were determined to be impractical. Finally, according to Weber and Shaw's research, replayability can be refined further into customizable goals and choosing different player characters. The following is a summary of what features are turned on and off based on the player type assigned by the game:

Quality	Player Types					
	Hedonist	Loner	Competitor	Butterfly	Leader	Follower
Custom goals	Yes	No	No	Yes	No	No
Game characters	No	Yes	Yes	No	No	No
Music	Yes	Yes	No	Yes	No	No
Player characters	No	No	No	Yes	No	Yes
Replay with different characters	Yes	No	Yes	No	No	No
Sound	No	No	Yes	No	Yes	No
Story	No	Yes	No	No	No	No

Table 3 – A summery of what game features that were emphasized for each player type.

Player type features

Custom Goals

The game had two victory conditions: collecting 50 boxes of radioactive cargo or rescuing 10 crew members. Hedonists and Butterflies could choose either goal. Other player types were randomly assigned on of the two goals.

Game Characters

Loners and Competitors saw characters other than themselves as part of the story sequence. Other player types did not see other game characters.

Music

Regardless of the player type, the game always plays music. For Leaders, music plays at full volume and they can tweak the music's volume. For other player types, the sound plays at half volume and they cannot tweak the sound volume.

Player Characters

Butterflies and Followers are allowed to customize their character's portrait in the beginning of the game. The player was allowed to change their character's gender, hair color, skin color, and eye color. They were also allowed to choose a name for their character.

Loners and Competitors could see their character's appearance during the story dialogs. However, the character appearance was randomized and could not be changed

Hedonists and Leaders never saw their character face.

Replay with different characters

Hedonists and Competitors are allowed to purchase a different hover craft with different abilities and replay the game.

Sound Effects

Regardless of the player type, the game always plays sound effects. For Competitors, sound effects play at full volume and they can tweak the sound effect's volume. For other player types, the sound plays at half volume and they cannot tweak the sound volume.

Story

Loners experienced the game tutorial and get an introduction to the game's story through a series of character dialogs. Competitors also received the same story content not because story is important to Competitors, but because game characters are important to Competitors. It is difficult to present game characters without a story. Players of different types received basic dialog boxes that explain the game's basic premise, objectives, and controls.

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