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Part 1: Research

Research in Aesthetics and Punishment/Reward Threshold

According to known psychologists Dr. John Gottman, author of **7 Principles for Making Marriage Work** and Dr. Terri Orbuch's, author of **5 Simple Steps to Take Your Marriage from Good to Great**, research has shown that in the most fulfilling marriages there is at least a 5 to 1 ratio of positive to negative experiences. Marriage can be considered the most complex interaction, or highest level of interactivity, of the human condition. Interactivity can be defined as two active agents that can gather, process, and convey information to one another. Games also work on the principle of interactivity, the two active agents being between two humans or a human and a computer, but are constrained by rules and end with a win/lose scenario. Games produce high levels of interactivity between the user and computer, creating a relationship. Developers of these video games try to produce a positive experience that keeps the players interested for as long as possible. But a purely positive experience can be just as detrimental as an overwhelming negative experience when it comes to video game interactions. Triumphant over easy challenges becomes a bore just as quickly as an impossible challenge becomes frustrating. This leads to the birth of the term *cognitive flow* in the game industry, the study of balancing the player's skill level with the game's difficulty to create challenges hard enough to challenge and easy enough to give positive experiences has the potential to increase overall playtime. Therefore the psychologist's punishment/reward ratio and game developer's cognitive flow have similarities. Of course in the game industry there are exceptions to this idea such as **Dark Souls**, a AAA game created with the sole intent of making the most unfair and difficult gameplay imaginable. This suggests a discontinuity between the two concepts. The optimal calibration of positive/negative experiences and skill/difficulty level is the focus of my research. So I will be creating three variations of the same game that range from a 5:1, 1:1, and 1:5 difficulty ratios.

In addition I will examine the effects of graphical fidelity. Common concepts of mental processing state that the less information the brain needs to interpret, the quicker the correct message can be received, and the more effective the communication will be. For instance, studies in visual communication have found that people can process black and white images quicker than their colored counterparts and that abstract logos are generally more effective in brand identification. So I will also craft an abstract, stylized, and realistic version of the game for each difficulty ratio, resulting in nine games total. After the games are complete I will compile the data from numerous play testing sessions. Testers will not be made aware of the experiment until feedback forms are distributed. I'll then analyze the data and see exactly how both the reward ratio and type of aesthetics affect the user's experience.

	5:1	1:1	1:5
Abstract	Low LOD Easy Difficulty	Low LOD Medium Difficulty	Low LOD Hard Difficulty
Stylized	Medium LOD Easy Difficulty	Medium LOD Medium Difficulty	Medium LOD Hard Difficulty
Realistic	High LOD Easy Difficulty	High LOD Medium Difficulty	High LOD Hard Difficulty

LOD (Level of Detail)

Converting Static Research into Dynamic Gaming

Typical research environments involve control groups, constants, variables, and absolute conditions. The absolute conditions are needed to maintain the constants during testing, as in the 5:1 ratio of positive experiences. If the conditions allowed for users to achieve a reward ratio that was something other than 5:1 the data couldn't be used. The need to maintain a constant presents a problem when converting this research module into a game format. For every 5 doable challenges there has to be 1 challenge that is impossible to accomplish. Video games rely on hand-eye coordination along with problem solving, skill features that tend to make impossible challenges blatantly obvious. Being able to identify these impossible challenges undermines the trust the player has in the game, usually resulting in a premature exit of the player from the game. If the challenge has an incredibly small percent chance of success, the most unusually skilled players might still upset the absolute conditions. So, if the player's skill is outside the developer's influence, then we switch over to what we can control, which is spawning. Spawning is to create an object; in games it means creation in regards to an enemy or player character. I can't control if the player kills an enemy or not, but I can control what enemy spawns and how it interacts with the user. Creating two enemies, one that gives rewards and the other that gives punishments to the player will give me control over the punishment/reward ratio. One way to reward a player is to give them something to collect that aids them in some way. So when the player defeats a reward enemy, they can collect a reward. When the player defeats a punishment enemy they will always receive a punishment.

The Data

The target audience will be the diverse student body at the UTA campus, college students of any decent, gender, and age in the range of 18 to 25 years. Signup sheets will be displayed two weeks before play testing begins at the MAC (gym) and the UC (cafeteria). There will be two dates available with three time slots each. Each time slot will consist of 60 available seats (3 labs with 18 seats each). Once the seats have been filled or the deadline has arrived the sign-up sheets will be removed. The play test will be held in the computer labs on the fourth floor (TBD). Each lab will have a different artistic style and each artistic style will have three levels of difficulty (6 seats for each difficulty). At the end of each session each tester will be given an evaluation sheet. All variables assessed on the evaluation form will be rated on an 11-point scale.

The Variables

Time Played – How Long did you play before becoming bored?

Highest Score – What was your highest score?

Value of Game – How much would you pay for this game?

Visual Appeal – How visually appealing is the game?

Identifiable – How identifiable are the objects in the game?

Difficulty – How difficult is the game?

Experience – How experienced are you at playing games?

Enjoyable – How Enjoyable is the game?

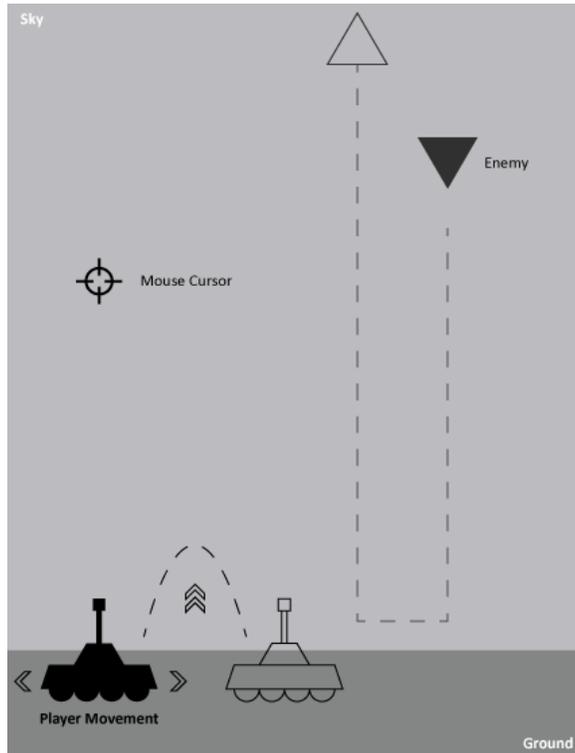
Motivation – What constantly motivated you to keep playing the game?

Part 2: Game Mechanics

The Player

The game will be simple in nature to allow me to include the biggest test group possible, ranging from first-time novice players to seasoned veterans. To create a simplistic game, I eliminated the third axis to make it a 3D game stuck on a 2D axis, usually referred to as a “Top Down Shooter” or a “Side Scroller”. The target platform for experimental purposes is for PC/Macs. With that in mind, the character controls will be the traditional “WASD” and the aiming/shooting will be with the mouse for the computer. The player avatar will be represented by a tank confined to the bottom of the

screen with gravity. Booster jets will allow the tank to jump up in the air to avoid obstacles. Physics will bring a second tier of mechanics to the locomotion of the tank through the firing of its main cannon. With every shot fired, the tank will receive equal force in the opposite direction allowing the tank to use cannon fire as a speed boost in any direction, but up.



The Power-Ups

The *rewarding enemies* will drop tokens that raise the player's score and power ups. Power up can increase basic abilities, such as mobility, defense, and offense, or grant a special ability for a short duration.

Armor equates to having stackable additional lives. When the power up is acquired, visible armor appears and then falls off when hit.

AOE or Area of Effect, when detonated, creates a radial space in which enemies get hurt. This is not a stackable ability and it has limited ammunition of three shots.

Screen Clear traditionally destroys all enemies on the screen regardless of enemy's strength or numbers. This type of screen clear fires off one projectile that quickly multiplies in a pattern. This action generally clears the screen, but not instantaneously nor absolutely.

Crowd Controller launches a slow-moving black hole, or projectile that draws enemies to its center. This is not a stackable ability and it has limited ammunition of two shots.

The Enemies

The enemies are divided into two categories, reward and punishment. The rewarding enemies will be able to fire a projectile and when killed will drop power ups that grant the player better attributes. On the other hand, the punishing enemies give no rewards of any kind and carry obstacles, such as bombs that drop either when the player destroys the enemy or when the enemy reaches the ground. Dropping the bomb, regardless of whether or not the enemy reaches the ground insures the 5:1 ratio. The longer the user plays the more difficult the game gets. Every time the reward ratio is spawned, a small amount of time is taken away from the spawn interval, which means the enemies spawn faster and faster. This escalating difficulty will continue to happen until the player is overwhelmed and defeated. A high score system will be in place for extra motivation, but there will be an hour time-cap for the test groups to play.

Part 3: Inspiration and References

Books

Gottman, John. *7 Principles for Making Marriage Work*. Random House/Three Rivers, 2000. Print.

Orbuch, Terri. *5 Simple Steps to Take Your Marriage from Good to Great*. New York: Delacort, 2009. Print.

Berne, Eric. *Games People Play: The Psychology of Human Relationships*. New York: Ballantine, 1996. Print.

Games

From Software, *Dark Souls*, From Software, 2011. Playstation.

Tomohiro Nishikado, *Space Invaders*, Taito, 1978. Arcade.

Nintendo EAD, *Star Fox 64*, Nintendo, 1997. Nintendo 64.

Nintendo Creative Department, *Super Mario Bros*, Nintendo, 1985, NES

Gearbox Software, *Borderlands*, 2K Games, 2009, PlayStation 3, Xbox 360, Microsoft Windows, Mac OS X, Cloud [OnLive]

EA Digital Illusions CE, *Battlefield series*, Electronic Arts, 2002, Microsoft Windows, Mac OS, Xbox, Xbox 360, PlayStation 2, PlayStation 3, Wii U

DMA Design, *Grand Theft Auto series*, Rockstar Games, 2001, PlayStation 2, Windows, Xbox, PlayStation 3 [PSN], Mac OS X, iOS, Android

tinyBuildGames, *No Time To Explain*, tinyBuildGames, 2011, Windows, Mac, Linux, iOS

Nintendo R&D1, *WarioWare Inc.: Mega Microgames*, Nintendo, 2003, Game Boy Advance, Nintendo GameCube, Virtual Console

Rovio Entertainment, *Angry Birds*, Rovio Entertainment, 2009, iOS, Android

Video Game

PLAY

TESTERS

WANTED

For Sunday September 14, 2014. Sign-up sheets are available online at
www.SignUpGenius.com/go/10C044DACAA28ABFD0-ornery PassCode: **Tester**



ORNERY

www.signupgenius.com/go/10C044dacaa28abfd0-ornery
PassCode: Tester

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