

ON THE SHOULDERS OF GIANTS:
AN EXPERIMENT IN DEATH
AS A MEANINGFUL PLAY MECHANIC

by

Robert Joseph Layton

A Thesis Presented to the
FACULTY OF THE USC SCHOOL OF CINEMATIC ARTS
UNIVERSITY OF SOUTHERN CALIFORNIA
In Partial Fulfillment of the
Requirements for the Degree
MASTER OF FINE ARTS
(INTERACTIVE MEDIA)

May 2009

Copyright 2009

Robert Joseph Layton

TABLE OF CONTENTS

List of Figures	iii
Abstract	iv
Keywords	iv
Concept	1
Project Description	7
User Experience	11
Prior Art	15
Evaluation Scenarios	19
Discussion	21
Conclusion	26
Additional and Future Work	27
References	29

LIST OF FIGURES

Figure 1: Overhead View of Play Environment	13
Figure 2: Side View of Play Environment	14

ABSTRACT

On the Shoulders of Giants is a generational adventure game set in a fictional world where humans are beginning colonization efforts on Mars. Rather than play as a single character, the player controls each individual character in a succession that comprises multiple generations of a bloodline. With a limited amount of time in each character's life, the goal of the player changes from accomplishing personal objectives in the short-term to preparing future generations for their own successes. The decisions of each lifetime act as the foundation for the play environment of future generations. Using death as a core play mechanic, On the Shoulders of Giants offers an unusual perspective by addressing concepts of multi-generational problems, player death, player birth, and the influence of genetics and the environment on the success of the individual.

KEYWORDS

Death, birth, family, generations, genetics, bloodlines, lineage, time, ancestors, descendants, civilization, environment, generativity

CONCEPT

The concept for *On the Shoulders of Giants* began with the desire to create a game that handles death in a meaningful way. Traditionally a game allows the player multiple “lives” where each life allows the player another try at overcoming the obstacles the game presents. Many games go further and allow for an infinite number of lives, allowing the player an unlimited amount of attempts at completing the game. The collection and consumption of lives as a commodity in games serves to diminish the value of each life. These mechanics cause death in games to be frustrating, inconvenient, or trivial.

The reasons for the current trends in how death is handled in games are varied. In a large way, games began gaining popularity when they began appearing in video arcades. The business model for an arcade game is to offer entertainment but to require players to frequently put money into the machine in order to keep playing. Typically this means the game increases in difficulty and causes the player to be overcome by enemies or obstacles until they die. Money, often represented by coins or tokens, is then inserted into the machine in order to continue the game. This system necessitates a situation where death is meaningless, as a successful game will cause the player to die frequently so as to prompt the player to insert additional tokens and generate more revenue.

Home console games didn't have the restriction of requiring the player to frequently insert money to continue playing, and so could avoid this system. However, many early

home console games were ports of arcade games, meaning they were the same game adapted to work on the hardware the user had in their living room. The mechanics of life and death were unaltered in the porting process, but without the requirement of inserting additional money the occurrence of death became merely an inconvenience or frustration.

Due to these differences, modern games treat death in a different way from arcade games. Typically a character's death results in a loss of progress in the game. This can manifest itself in various ways. Players may lose resources such as in-game currency, healing items, and character equipment. Oftentimes players are required to restart the game from an earlier point in the game level, or even from the beginning of the game itself. In many of these games lives can be accumulated by collecting them in the game or earning them through achieving high scores. In these circumstances lives act as a resource that can be consumed, purchased, won and lost; ultimately lives are a part of the economy of the game in the same way that healing items and weapons are. We can look at the presence of additional lives through the lens of the economic "law" of diminishing marginal utility: With each additional life available in the game, the value of each single life decreases. While this is not tied directly into how meaningful each life is, it offers insight into how each life is perceived by the player in the mechanics of the game.

The intent of *On the Shoulders of Giants* was to make death meaningful to the player beyond a loss of resources or arbitrary losses in progress. In the game, each character has one life, and when the character dies, that death is permanent. The concept of permanent

death (also informally known as “permadeath”) in games is a controversial one. While intellectually and conceptually a strong motivation for players, in practice players often express frustration at permanent death mechanics. In games where a single character is controlled, players often argue that the punishment of losing all progress in a game is too harsh. In games such as *Fire Emblem*, where players control multiple characters at once, the permanent death of a character (known as a “unit” in the game) means the loss of that unit's abilities for the duration of the game as well as any narrative content that is only available when the character is alive and present. This concept of permanent death in *Fire Emblem* was discussed in an interview of Toru Narihiro, who managed the production of *Fire Emblem: Shadow Dragon*, a game for the Nintendo DS. Narihiro refers to the practice of resetting the game and losing progress in order to recover a lost ally as “perfect play,” and while he mentions that “losing is a great lesson that I hope players can get through [the game],” he also admits to resetting when certain units are lost (3).

One of the first ideas for *On the Shoulders of Giants* was to leave some sort of artifact in the environment to mark where the player character had died. Traditionally games have had little reason for leaving a persistent marker of a character's death, because deaths are not permanent. Instead the level is restarted, or the player is returned to a previous checkpoint, or the game simply ends. This treatment of death relates to the player that death is an undesirable outcome or more importantly the “incorrect” outcome of a character's life, rather than its inevitable conclusion. Rather than deal with the death in a

meaningful or thoughtful manner, instead the game is reset at a point where, in the narrative of the game, the death never occurred. Some games have called explicit attention to this idea. For example, Ubisoft's *Prince of Persia: Sands of Time*, the game's story is communicated through “narration” by the player character, the Prince. The Prince delivers his narration in past-tense, suggesting the events the player is experiencing have already happened. Obviously this means the Prince has not died, but that does not prevent the player from dying in the game. When the player dies, the Prince comments aloud, “That's not how it happened” or “I didn't die in that battle,” suggesting the death was an error in the story-telling. The natural conclusion is that the hero in the game is never supposed to die, and so it follows that there should never be a gravestone for the hero unless it is featured on a “Game Over” screen.

In contrast, character death in *On the Shoulders of Giants* is not only inevitable but required to progress in the game, as each character must pass on in order for their child to continue the adventure. With this mechanic at the heart of the game, the subject of memorializing death becomes relevant. Whereas a gravestone would mean the end of the game in a traditional adventure game, in *On the Shoulders of Giants* it stands as a memorial to what the character accomplished and the life they lived. Players can see each gravestone and think back upon the actions they took with that character and how that influenced later characters. In *Constructing Death*, author Clive Seale mentions gravestones are monuments that serve as a way “to achieve symbolic immortality” (63). The use of gravestones in *On the Shoulders of Giants* reinforces this argument. Even

more specific to the game is the subject of “Generativity,” which Seale also references as “the investment people make in guiding the generation that follows them.” By this definition, *On the Shoulders of Giants* is a game about generativity. Seale comments that generativity is itself a form of monumentalism: “Men were encouraged to treat their sons, in particular, as extensions of their selves” (63). By preparing their children for the future, a person can achieve immortality not only through their genes but also through their external and psychological influence.

As the design of *On the Shoulders of Giants* centered on character death, the subject of long-term implications arose naturally. As individuals we are easily able to understand the impact that our surroundings and our immediate past and present have on us, but the further one progresses in time from the present day, the more unclear the relation between the future and the present. In other words, it is difficult for us to conceive of how the actions of those who preceded us by hundreds of years have an effect on us today. It is similarly difficult to imagine how our actions today might influence the world and actions of those descended from us in decades or centuries. Indeed, as individuals our actions are often geared to solving problems that have an immediate or near-immediate solution. When faced with a problem that seems to have no near-term solutions, we often delay action or ignore the problem entirely, leaving it to future generations to solve.

In this context it would seem that some long-term problems may never get solved, depending on the complexity or immediacy of the problem. Knowledge must somehow

pass from one generation to the next in order for problems of large magnitude to be dealt with effectively, and knowledge must be distilled so that it is not constantly relearned. Philosopher Alfred Korzybski argued that this knowledge is handed down in abstractions known as “general semantics.” Of particular note to this project is the concept of time binding, which Korzybski argued was a uniquely human trait. Time binding details the ability for humans to pass on knowledge to future generations at an accelerating rate, which allows for the advancement of civilization and the ability to avoid rediscovering or relearning the same lessons as our ancestors (89, 109).

The concept of multi-generational thinking and problem-solving is core to *On the Shoulders of Giants*. Modern-day issues such as the impact that humanity has on the environment or the financial crisis in the United States demand consideration regarding the inevitable long-term repercussions of present-day actions. The game was developed with the intent of providing this sort of long-term viewpoint and illustrating how the impact of each decision reverberates through generations.

Finally, *On the Shoulders of Giants* is a computer game conceptualized and designed for an audience that is on some level familiar with games and gameplay that falls in the adventure or platformer genres. While accessibility to a wide audience is a goal for many interactive projects including this one, the game and gameplay is designed with the assumption that the player is familiar with the mechanics found in this genre of game and will therefore be able to appreciate the differences, sometimes subtle, that a generational

direction brings to the game. Compared to other games which handle the raising or use of descendants, *On the Shoulders of Giants* is an attempt to bring generational gameplay into an adventure game where rather than conveying an established narrative that involves a lineage of characters, the game's generational elements are central to the gameplay and provide for a wide variety of outcomes.

PROJECT DESCRIPTION

On the Shoulders of Giants is a generational adventure game played on the personal computer. Players control a bloodline of colonists who have crash-landed on Mars and are attempting to survive on the hostile planet while collecting the parts of their spaceship that have been scattered around the landscape. The spaceship parts are located in various areas of the world, and in order to reach them the player must use a combination of two methods of improvement: genetic and environmental. This set of options can be viewed as the classic “nature versus nurture” debate, which argues whether one is genetically predisposed to certain traits or whether behavioral or environmental upbringing is more responsible for traits. *On the Shoulders of Giants* takes the argument that both are equally important or useful in accomplishing goals and offers players the ability to both manipulate the environment to improve the chance of success for future generations as well alter their genes through the player's choice of mate.

Environmentally, players can plant fruits that will eventually grow into trees. Once grown, these trees produce more fruit, which acts as both a food and healing source for

future generations. The branches of the trees also provide additional platforms to aid in traversing the environment. Players can also construct small mechanical objects such as elevators or bridges that can further aid in traversal of the environment. Through this mechanic players can invest in future generations by improving the foundation of the environment they will be born into.

Genetically, the choice of mate also influences the abilities of future generations. Each character in the game is defined by three primary “genes”: body, mind, and heart. By mating with a physically strong character, future generations will be able to run more quickly as well as jump higher, and will be able to take more physical damage before dying due to their improved bodily health. Mating with a mentally strong character, on the other hand, provides future generations with improved building abilities that can then be leveraged to provide quicker access to various areas in the game world. Various secondary genetic traits, such as hair color, are passed down to children, establishing a visual link between the related characters. Efficient players manage both “nature” and “nurture” aspects of the game, improving the success rates of future generations by reproducing with strong mates and altering the environment to make it more suitable to live in and explore.

The old adage is that “a chain is only as strong as its weakest link.” In the context of *On the Shoulders of Giants*, this is reflected in that the weakness of any individual character threatens the stability of the entire bloodline. If a character should die without first

procreating, the chain is broken permanently and the game ends. The harsh realities of death make each life more precious and valuable as well as emphasize the value in procreation and having descendants to carry on your legacy. Thus, though character death in the game is permanent, the game will continue if an heir has been born before the player's character dies. The value of having a family and ensuring the continuation of the bloodline offsets the value of living life on one's own, free of the responsibilities that a family entails.

An objective of the design of *On the Shoulders of Giants* is the illustration of the differences in each stage of life through changes in the gameplay. Each character's life lasts between five and ten minutes in real-time, but in the game world this is represented as the vitality of the character's entire adult life. During this time, players can direct their character to explore the world on their own, find a mate, manipulate the environment, and interact with their family members in various ways. The stages of life are illustrated in how the gameplay changes in each of these situations. While the player is on their own, they are able to explore the world to the best of their abilities, untethered to a family. Of course, before the character's vitality has expired, they must find a mate so that they may produce an heir to continue the bloodline.

Finding a mate generally involves talking to NPCs of the opposite sex, comparing genes and compatibilities and finally courting the desired mate. A potential mate's attraction to the player character is indicated by a heart icon that is displayed above the NPC. By

bringing objects such as flowers to the NPC, the attraction between the characters may improve. This attraction can also be increased by staying in proximity to the NPC as well as talking to him or her more frequently. Once the player feels that the attraction is strong enough, they may click on the heart icon and attempt to mate with the NPC. Success results in conception and the addition of the mate as a partner character and the first member of the player's family.

Once the female has conceived, a short time passes until the pregnancy is brought to term. When a child is born, time advances forward roughly ten years, resulting in a small child alongside the player character and his or her spouse. Once the player's character is a parent, they are able to travel on their own, but doing so may stunt the growth of their children either physically, mentally or emotionally. These characters become the next in the line of player-controlled characters so keeping their growth on pace is vital to success in future generations.

Overall, building and maintaining a family is a way for players to safeguard against a death that will end the game, but it also prevents them from exploring the world as much as might be possible on their own. This risk-return decision becomes a fundamental choice the player must make consistently throughout the game. The security afforded by family members and future generations is balanced by the desire to venture out and explore areas that are only accessible when alone.

USER EXPERIENCE

On the Shoulders of Giants is played on the PC using a keyboard and mouse. The keyboard is used to navigate the player character through the game space, while the mouse is used for interaction with menus and various interactive objects in the game world. The game is presented in a widescreen aspect ratio, and stereo sound completes the experience.

When the user starts a new game, the player finds his player character at the crash site, where his spaceship has wrecked upon the planet. Using the keyboard to move around the environment and the mouse to interact and examine objects, the player finds that he is trapped in a small area with a few generic non-player characters (NPCs) and his NPC spouse nearby. The player's vitality meter is low and draining steadily. Before it runs out the player must click the heart icon that appears above the spouse character. Doing so initiates a mating sequence, which causes the couple to “settle down” as a makeshift home appears and the screen fades to black. Text appears on-screen to let the player know that time has passed, and when the screen fades in we see that the player's character now has a child that can follow it. The player is able to explore and interact with the child character until the vitality meter expires, at which point the screen once again fades to black as time passes.

When the screen fades in, the player is now in control of the child that was seen in the previous scene, and the child has grown into a man or woman. Text once again indicates

that another generation has passed. This newly playable character begins his adult life standing at the grave of his parents. The cycle begins anew as the player can explore the environment, find a mate, have children and eventually pass on to their heir. With this new character and its improved genes, the player can explore new areas in the game.

Exploration and adventuring in the game is handled in the same way as the opening section of the game, but with a wider variety of environments and objects to interact with. Players move their character with the keyboard and interact with objects using the mouse. Clicking with the mouse allows players to investigate what objects or other life forms are, and how heavy they are. Mouse control also allows characters to pick up and transport objects or other characters throughout the environment.

With a family, the player has additional options to consider. Players can tell their family members to either follow them through an area or ask them to stay where they are. Players may also pick up their children to help them through a difficult environment or simply to bond with them. Additionally, players may instruct their children to do tasks such as planting fruit. This will improve the child's ability to plant fruit in the future.

Aesthetically, *On the Shoulders of Giants* is presented with three-dimensional (3D) character models moving in circular levels. While the visuals are created using 3D assets, the camera views the action from the outside of the circle and follows the characters around the circle, which frames the gameplay in a two-dimensional (2D)

space. This type of gameplay is traditional to the adventure and platformer games that can be found on the personal computer (PC) or more commonly on home video game consoles.

FIGURE 1: Overhead View of Play Environment

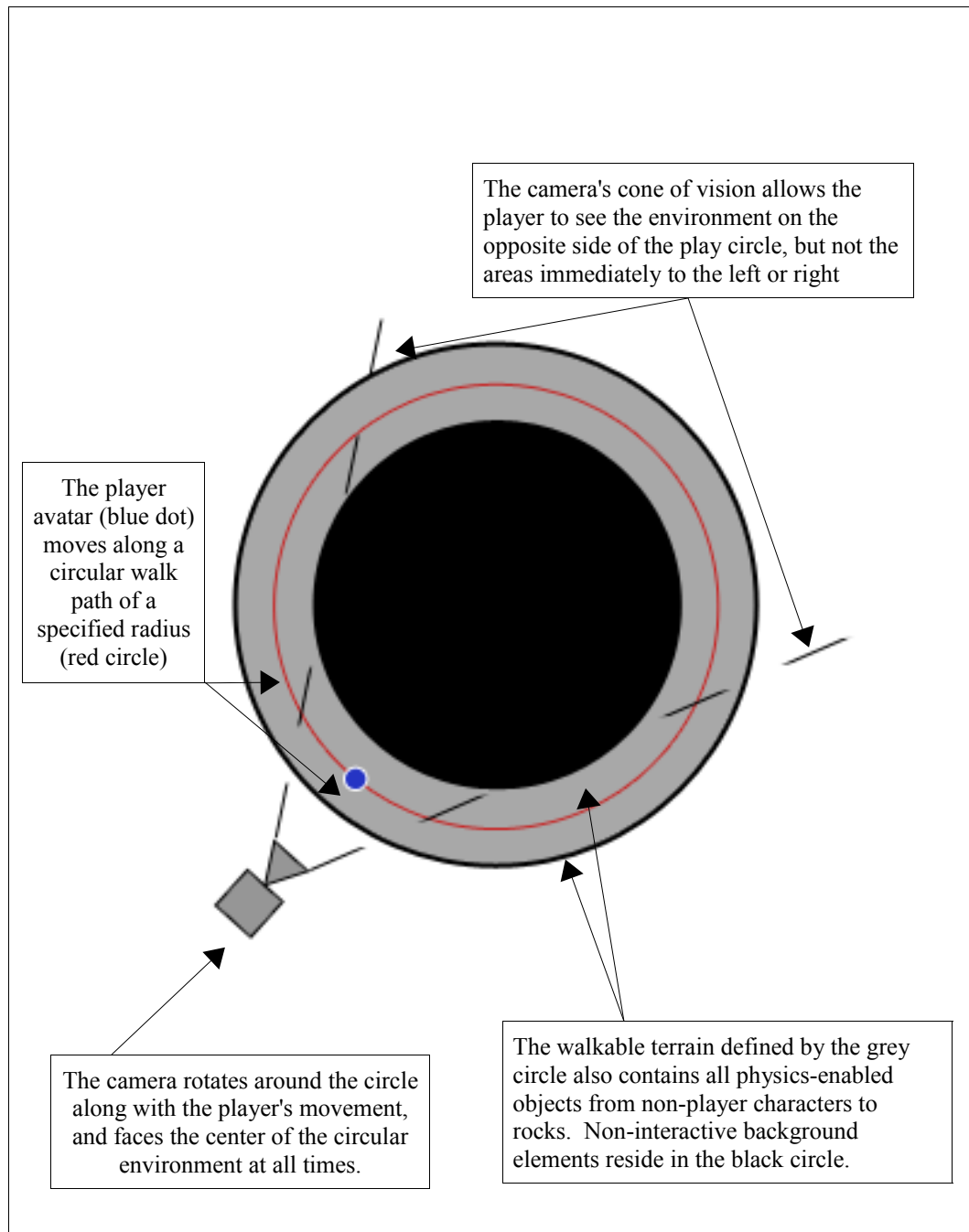
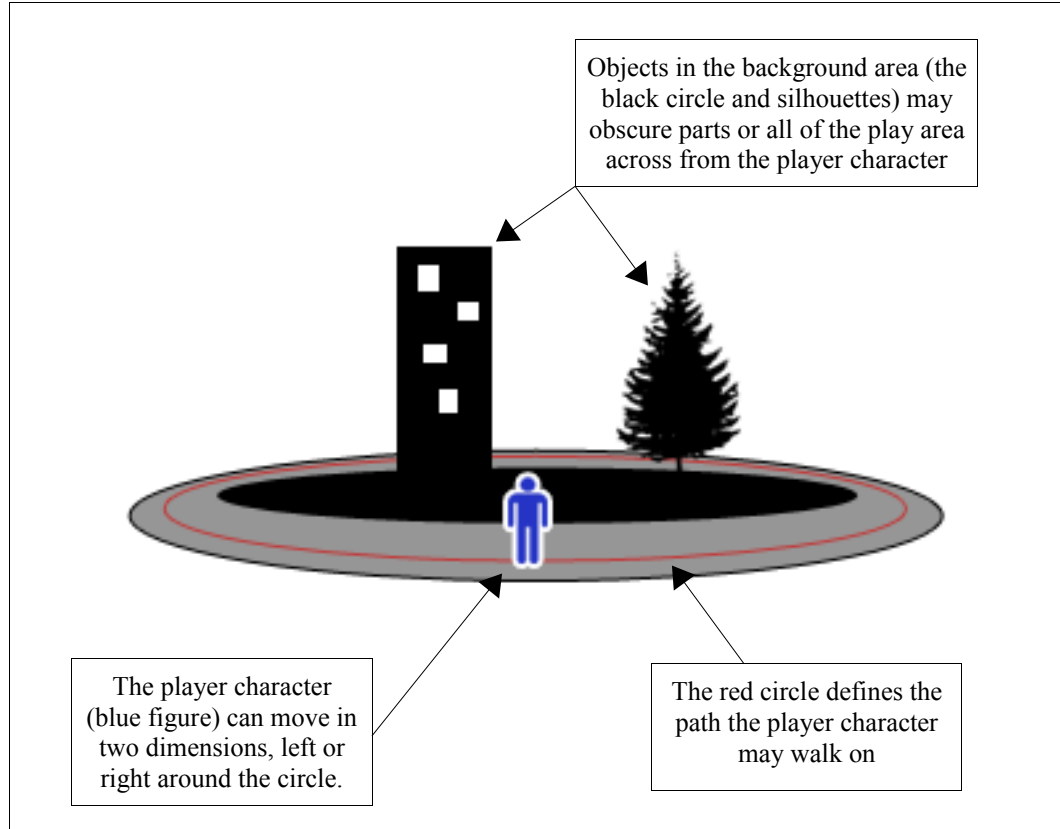


FIGURE 2: Side View of Play Environment



Visually, the planet Mars that is presented in the game is abstract, with colors that present a distinctly different feel than Earth. A largely red terrain with large rocks, black trees with brightly colored leaves, and starry skies dominate the view. The characters themselves are kept intentionally abstract and cartoonish. The males have exaggerated upper bodies that slim down to small legs, while the females have larger hips. To avoid the need to produce an exorbitant amount of content for the game, each character is built upon a similar model that is modified slightly in real-time to reflect genetic influences. The abstractness of the characters allows the player to personify the characters in the way they feel is appropriate as well as preventing the feeling that every character is a “clone.”

Finally, the abstract characters reinforce the main theme of the game, which is that the entirety of the bloodline is more important than any of the individual characters that comprise it.

Aurally the game presents the player with a very quiet environment, punctuated by the sound of characters moving across the landscape to simple music defined primarily by percussion instruments. The audio is designed to complement the relatively abstract visuals of the game and induce a contemplative mood in the player, but also one of foreboding.

The general mood of the game is one of tension, where survival is difficult alone, and ensuring the bloodline's existence into future generations is a reward in of itself. The world begins empty and desolate, and as the player advances through the game, the environment reflects changes just as the various members of the bloodline do.

PRIOR ART

There have been several games that have delved into the concepts of multiple generations of characters, to varying degrees of success and innovation. Oftentimes the concept of having generations of characters is directly tied into the narrative of the game rather than into the game mechanics themselves. While some games incorporate procreation as a mechanic, they are not the means of game progression that is seen in *On the Shoulders of Giants*.

The majority of games with a generational aspect have been largely confined to the role-playing game (RPG) genre. The *Harvest Moon* series of games has several games that allow for mating and procreation. *Harvest Moon* is a farming RPG where the player controls a farmer that can grow his own crops and sell them at market. Part of the game includes finding a mate, marrying, and starting a family. In most of the games, including the original game on the Super Nintendo, mating is done by talking to females, giving gifts, checking their diary for an indicator of a positive relationship, and eventually proposing. These games are often quite long and focus on the growth of a single character and his farm over time. Later games in the series, such as *Harvest Moon: A Wonderful Life*, allow you to have a child and have their looks and personality reflect the girl that was married to produce the child. *Harvest Moon: Tree of Tranquility* allows the player to start a new game as the child they produced in a previous game.

In *Fire Emblem: Seisen no Keifu* for the Super Famicom (Japan), the game takes place in two parts. The first part of the game involves building relationships between units through dialogue and placing units adjacent to each other on the battlefield. Each relationship can advance three times, at which point a proposal can be made. This proposal influences the second stage of the game and the stats of the child that is produced between the two characters. Two magic-using characters will likely produce a child that is adept at magic, for instance. However, the content of the characters is largely predetermined. Character portraits in the game are linked to specific characters,

and each potential mother has one child that they will inevitably produce. The offspring of the character is changed purely on a statistical basis.

Romance of the Three Kingdoms, while not featuring mating and procreation, does feature deep lineage as a substantial part of the game. The units and characters in the game are based upon historical Chinese generals and strategists, and so those with a long and prestigious lineage become fearsome foes or allies in the game. Conquering an enemy with a long line of heirs may take an extremely long time due to the slow-paced nature of the warfare and the continual reinforcement of new blood.

An interesting example of heredity and reproduction being a primary focus of a game is in *Ore no Shikabane wo Koete Yuke (Over My Dead Body)*, a RPG released for the Sony Playstation in Japan only. In the game, players control the offspring of a family of warriors that fell to a demon's curse that causes extremely rapid aging and a two-year lifespan as well as the inability to reproduce with other humans. The gods allow you to reproduce with other gods, however, allowing you to produce increasingly powerful children. This game's mechanics involve you using your new abilities to fight enemies of increasing strength until the demon can be defeated and the curse lifted. The concept of generations is tied directly into advancement in the game and is a great example of using offspring as a way to advance the game in a meaningful way.

Other RPGs that have generational aspects to them include games such as *Phantasy Star III: Generations of Doom*, *Lufia II: Rise of the Sinistrals*, and *SaGa Frontier II*. Each of these games involves the use of future generations to advance the plot or influence character statistics in some fashion.

Outside of the realm of RPGs are games such as *The Sims* from Electronic Arts, for the PC. In these games, coined as “god games,” players are able to move a family of characters around and interact with them as they execute complex artificial intelligence routines. Effectively the game becomes a “living doll house.” One of the features of the game is that females can become pregnant and have a child, and the child will impose a new set of needs, wants, desires and fears into the simulation.

Of special note is *Spore*, a game also released by Electronic Arts for the PC. Rather than be about generations in the strict sense, the gameplay of *Spore* revolves around evolving a creature through various stages of life. Characters advance from the primordial stage to becoming amphibious, land-walking creatures, and finally space-faring creatures. Evolution is handled by the player, who can customize their creatures in an editor.

Beyond games, various literary works have been written about multiple generations and in particular the colonization of Mars. One of the primary books used as reference in the development of *On the Shoulders of Giants* is Ray Bradbury's *The Martian Chronicles*. The book details the colonization of Mars from various viewpoints, including from that

of the Martians before Earth men arrived, as well as the transportation of inescapably human actions from Earth to Mars. The message behind the book, warning of repeating the same mistakes on a new planet and the universal nature of the human condition regardless of setting was a strong force behind the aesthetic decisions in the making of *On the Shoulders of Giants*. The *Mars Trilogy* of books by Kim Stanley Robinson, especially *Red Mars*, also influenced the direction of the game. The Robinson science-fiction books not only detail the difficulties of humanity's attempts to colonize the planet but also how multiple generations of characters live and die on the planet and how far-reaching their actions are with regard to the advancement of Martian civilization. However, the game generally took a more fantastic direction similar to *The Martian Chronicles* as opposed to the more scientific-based literature of the Robinson trilogy.

EVALUATION SCENARIOS

The intent behind the development of *On the Shoulders of Giants* was to create a game that dealt with death in a way that is more meaningful than in other games as well as to engage the user in thinking about long-term, multi-generational issues. To gauge the success of *On the Shoulders of Giants* rests upon whether or not users feel provoked intellectually about these subjects.

In early prototypes of the game, the game loop was slightly different in structure but massively different in execution. Instead of using a mate to determine an offspring's genes, the actions of the character during their turn influenced the genes of their child.

For instance, if a father killed a lot of monsters then his child would be proficient at killing monsters. This led to an aspect of gameplay that was desirable to retain – players were excited for their children and were using the actions of their current generation to improve the abilities of their future generation.

For the computer version of the project, the primary method for evaluating the effectiveness of the project was to allow the player to talk during play as well as ask questions and then suggest refinements or additions of their own. Handwritten feedback was also taken. When users responded with questions or suggestions about interacting with the character's family or future generations, it was viewed as positive feedback

For all types of players, from those with large amounts of game experience to those with very little, the beginning of the game produced confusion and anxiety. The circular world confused some players, and many thought they could move forward or backwards before realizing only movements to the sides were possible. Beyond this, the looming vitality meter countdown proved to be a source of concern for players, as they wondered how they could prolong their lifetime or “heal” or otherwise avoid the character's inevitable death. Once the first death had occurred, however, and the player controlled the next child in the bloodline, player understanding of the game's core mechanic grew and these feelings of anxiety were reduced. Attention then turned to wanting greater interaction with family members and greater interaction with the world.

One of the biggest common threads between comments by play-testers was curiosity about possible personalities that could be applied to children, and how to have a larger role in raising the children. This led to future plans for teaching mechanics and happiness meters that would influence how characters responded and interacted with the player character.

DISCUSSION

When the project was first proposed, the game involved generations of a family in a medieval setting, continuously throwing themselves at taking down a dragon that was harassing them. While the setting changed, the end goal remained the same: to provide a game where the goal was something that could only be accomplished by coordinating the efforts of a sequential lineage of characters and the sum of their life's work. The focus, however, for much of the project relied heavily on what the players could do in a single lifetime. Players were to be able to build, to grow, to manage a town, shop, trade with other players, fight enemies, and so on. It was a massive project, and yet for all of its features the innovative contributions the project could make were being overshadowed and to some extent squandered.

Once the project centered on death as a central play mechanic, it became easier to scale the project down and focus on the mechanics that reinforced the premise that death was not only meaningful but vital for progress. Originally the game had a system for battle

integrated into each character's life, and fighting monsters and enemies was a primary feature of the gameplay. In the end, all gameplay involving fighting monsters and enemies was removed, as it distracted from the more important aspects of raising a family and preparing for the future. The primary reason for the inclusion of fighting was to add more conventional gameplay as well as to provide consistent danger to the characters and keep the potential for death on the mind of the player. The “fight for survival” that was originally intended was more easily accomplished and communicated with a system of environmental hazards and defensive lifeforms that would react with hostility only when characters encroached upon them. This type of gameplay allows players to focus on the established platforming mechanics as well as the vital process of preparing for future generations.

Focusing too much on preparation became the next problem. A complex system of environmental manipulation and “terraforming” was developed, where players were able to shape the land itself and interact with an ecosystem. Rather than simply growing a tree, players would first have to find a source of water, tend to the tree as it grew, find nutrients, and so on. While this mechanic seemed to have promising similarities to the process of raising a child, it ended up distracting players from it. However, the primary reason for the removal of this gameplay was the fact that it actually consumed a large amount of time and mental energy from the player, and made each individual lifetime too long. As each lifetime was extended, the importance of death as a core mechanic was diminished. However, the ability to impact the environment and change it in some way

for future generations was also deemed necessary for conveying the message that the actions of each life make a difference on future generations. The solution was to allow the player to make changes with simple actions that had a large impact. In recognizing that each stage of a character's life was being reduced to a small amount of time (a fact that led to each life stage being referred to as a “snapshot” during development), it made sense to also reduce the act of creation and change into single acts with significant implications on the environment. These changes made the issues of death and making meaningful choices during life more immediate and significant to the player.

For a great majority of the project's development, a function allowing players to save their game and return to it later was both planned and implemented. This feature was removed. While its removal was controversial and altered the design significantly, it accomplished two goals, both vital to the project. The first result was that the game was necessarily shortened so that a player could complete the game without requiring an unreasonable time investment. The reduction in the final game time meant that each character's individual lifetime had to be shortened, and this had a large impact on the final design of the game. Short lifetimes meant that death was a more consistent force in the narrative of the game, and it also led to the reduction or removal of some features (such as the aforementioned terraforming and building mechanics). The second result was that it prevented the tendency for players to reset the game when poor choices were made or death occurred suddenly. With the knowledge that saving was impossible, players are able to accept death more readily and try to make the best of each lifetime rather than

attempting “perfect play,” as was seen in the *Fire Emblem* series of games.

A perhaps more subtle objective of the design of the project was to tackle the subject of death in a manner that would make players consider their own lives and how they view their own mortality in reality. Philosophically a person's mortality is a rich subject: It provokes questions such as, “What is the meaning of life?” and “What comes after death?” Our views of death change over the course of our lifetimes, as well. In our youth, death may seem a distant threat, if it is thought of at all. As we grow older, and our passing grows more imminent, we may look at death with unease and tension, or even despair. *On the Shoulders of Giants* addresses this subject by asking: What does it mean for a person to look back on their life with regret? What does it mean for a person to look at death as inevitable release, with the knowledge that they are leaving behind a life well lived?

During each character's lifetime, a vitality meter counts down to the moment when a character will expire. During this time they can accomplish many things and they will make many choices. Because death is inevitable and unable to be delayed, each choice is significant. Performing one action may require time such that it prevents another action from being taken in that character's lifetime. The desired result is that when a player sees their current character's time coming to a close, they feel (at least) one of two things: regret at not being able to accomplish all that they wanted, or acceptance and an eagerness to pass on and see what the future holds.

Through constant iteration of concept, philosophy, design and implementation, the project has been brought to its core concept: a game about how one life leads to another and most importantly how death plays an important role in defining a life. It's a natural human desire to be remembered after death, though logically it makes little sense as fame and recognition have no use to a dead person. Still, we consider what it takes to be remembered, and what it takes to make a mark on history. *On the Shoulders of Giants* posits that while each individual will not and cannot be remembered, each person's actions are their own monument to their life and this monument persists as the foundation of the successes or failures of future generations.

A major concern in dealing with a game based on generational mechanics is the sheer amount of content required to make a large number of characters that are highly individualized. Many big-budget titles are able to deal with this by defining the specific possible combinations beforehand or by making the characters fairly generic. Perhaps, then, the truly limiting factor is not the content but the ability to tune the game for a wide variety of gameplay methods. Games that use generational content tend to rely on a menu-based method of input that allows characters to perform a wide variety of generic actions that are easily altered in code, but the player does not see a real difference in how the game is played from moment to moment. The game space is effectively a constant, but the statistics driving the character's impact on the space have changed.

The approach taken in *On the Shoulders of Giants* is different. The way the game is played changes with each new character because their abilities have changed and so the player must look at the environment in a fundamentally different way. If a character is unable to jump, movement through an area becomes about creating a pathway that allows for characters to walk across it. When gaining access to a character with a high jumping skill, however, the player looks at the environment more vertically, and looks at steep hills as places to jump upon as opposed to walls that cannot be passed. The gameplay occurs in real-time so the feeling of moving each character in the space is what gives each character their individual flavor. In addition to different abilities in the game space, the environment itself changes over time, a feature that sets *On the Shoulders of Giants* apart from most other generational games. A sapling may grow into a tree and bear fruit, and it may offer platforms that didn't exist to previous characters. This interplay between the expanding bloodline and the environment in which they exist is core to the game. Ultimately, however, what makes *On the Shoulders of Giants* interesting is the focus on future abilities and the constant planning in a real-time environment. Rather than be an adventure game with generational elements, it is a generational game with adventure elements.

CONCLUSION

On the Shoulders of Giants, a game about death as a meaningful play mechanic, suggests looking at aspects of life and the future from a perspective that we may not typically

consider individually. Nevertheless the cycle of life and death as well as the propagation of ourselves through our descendants comprises an essential aspect of humanity and civilization. On the surface it is something that is understood by everyone but is rarely explored with depth in the space of games. Still, the subject matter is ripe for exploration and offers a huge opportunity for learning. *On the Shoulders of Giants* addresses the desire in each of us to achieve a kind of immortality through our descendants and invites the user to contemplate what their monument to the future will be. User feedback to the experience has been largely positive, but it has also invited a great deal of suggestions for improvement and expansion, which again suggests the richness of the topic.

Through gameplay that emphasizes the importance of procreation and planning for the future, *On the Shoulders of Giants* promotes an awareness and discussion of the impact the actions of each generation have on each other. Goals are often impossible to accomplish in one lifetime, so the player uses each lifetime to aid in the ends of its descendants. While short-term goals will vary from lifetime to lifetime, the ultimate goal of a better life for future generations remains. When our deaths come, hopefully we can look back upon our lives with happiness and be content with what we have accomplished, as well as hopeful for the future, even if we are not there to experience it firsthand.

ADDITIONAL WORK

As with any software, there are a variety of improvements and features that could be added to improve the overall effect of the project. Initially the project had a distributed

multi-player component, where each player could affect the environment of another player, and mating between families was possible. This feature still retained the single-player focus of the game, but allowed for other players to add to and affect the game of each other player indirectly. Though this feature is currently absent from the project, its addition could add another dimension to the conversation about generations of a bloodline. The focus could expand from a single family's bloodline to viewing civilization as a giant bloodline of its own. In addition to the multi-player mechanics, the expansion of the happiness and teaching mechanics are good candidates for additions to the game. Players wanted more hands-on with each of the characters and exert more influence on both their children and the immediate world, so adding more features to this effect is a high priority for future work.

The development of *On the Shoulders of Giants* also led to discussion related to the treatment and expectations of violence in games. In games where character death is insignificant, violence is often viewed as meaningless or comical. This may be related to the lack of any sense of true loss due to the fact that characters will be revived later or have more lives at their disposal. The investment made into each life is minor, so the death of these characters doesn't represent a meaningful loss. An exploration into a situation where a character or some other entity has been cultivated and grown, and where death represents a loss of not only time but personal meaning between the player and the entity, would be very interesting to pursue.

REFERENCES

- Bradbury, Ray. The Martian Chronicles (The Grand Master Editions). New York: Spectra, 1984.
- Fire Emblem: Seisen no Keifu. Computer software. Kyoto: Nintendo Company Ltd., 1996.
- Harvest Moon: A Wonderful Life. Computer software. Tokyo: Natsume Company Ltd., 2004.
- Harvest Moon. Computer software. Tokyo: Natsume Company Ltd., 1997.
- Harvest Moon: Tree of Tranquility. Computer software. Tokyo: Natsume Company Ltd., 2008.
- Korzybski, Alfred. Manhood of Humanity. New York: E.P. Dutton & Company, 1921.
- Narihiro, Toru. "Iwata Asks - Fire Emblem: Shadow Dragon." Interview with Masahiro Sakurai. Fire-Emblem: Shadow Dragon. 24 Feb. 2009 <<http://www.fire-emblem.com/shadowdragon/interview/interview1.html>>.
- Ore no Shikabane wo Koete Yuke. Computer software. Contrail, 1999.
- Prince of Persia: The Sands of Time. Computer software. Montreal: Ubisoft Montreal, 2003.
- Robinson, Kim Stanley. Red Mars (Mars Trilogy). New York: Spectra, 1993.
- Romance of the Three Kingdoms (series). Computer software. Ashikaga: Koei Company, Limited, 1986-2005.
- Seale, Clive. Constructing Death: The Sociology of Dying and Bereavement. Cambridge UP, 1998.
- The Sims. Computer software. Redwood Shores: Electronic Arts, 2000.
- Spore. Computer software. Redwood Shores: Electronic Arts, 2008.