

Motivation for the Virtual Game

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Figure 1 Figure 1 3D player interest graph. 2003. Bartle. [Graph]

Introduction

The primary focus of this paper will endeavour to investigate the factors that affect a player's motivation, in regard to playing a virtual game. This will encompass both the initial interest of the player and what drives them to invest their time, effort and money in a game, also in some instances additional payments may be necessary just to be able to continue a particular play experience. For this analysis to be accomplished, the numerous factors that affect a player need to be collated, the principle source material, to not only ascertain these factors and their relationship to one another but to define them, will be taken primarily from game and behavioural/social psychology literature. Examples will be made through a wide selection of game genres to provide the most relevant comparisons. Further investigation will be undertaken to interpret how players relate to these factors, the ways in which they are successfully implemented by designers, and the cost of using them unsuccessfully. This leads to the question; what is the combination of factors that aid in the construction of a situation, whereby an individual is motivated not only to initiate with a virtual game, but also to continue to pursue that given experience?

To create a fully encompassed investigation into the roles of all the multilayered factors would by far exceed the capacity of this paper. Therefore, key factors within game play that act to motivate the player, not only to continue play but that encourages the initial engagement with a virtual game, will be established. For this, the paper will be broken down into the following sections; Reinforcement, Value and Motivation. An additional study will be made into points of secondary importance from these main topics. Furthermore, this paper will retain a primary focus on the

factors affecting virtual games, with a lower priority being given to games external to this condition.

As with the current pursuit of creating an understanding of the factors that motivate an individual in regard to a game experience, an understanding is required as to what in fact constitutes a game. There have been numerous attempts at this however, through the joint work of Eric Zimmerman and Katie Salen, who have collaboratively produced a set of guidelines, which have been constructed by combining several scholars' prior iterative attempts at defining a game. This has generated what will be adopted throughout this paper, as what is currently the most apt definition available for encompassing the definition of a game.

System: abbreviated as the four elements that all systems share;

- **Objects** are the parts, element of variables within the system.
- **Attributes** are the qualities or properties of the system and its objects.
- **Internal Relationships** are the relations among the objects.
- **Environment** is the context that surrounds the system.

Players: A game is something that one or more participants actively play. Players interact with the system of a game in order to experience the play of the game.

Artificial: Games maintain a boundary from so-called “real life” in both time and space. Although games obviously occur within the real world, artificiality is one of their defining features.

Conflict: All games embody a contest of powers. The contest can take many forms, from cooperation to competition, from solo conflict with a game system to multiplayer social conflict. Conflict is central to games.

Rules: We concur with the authors that rules are a crucial part of games. Rules provide the structure out of which play emerges, by delimiting what the player can and cannot do

Quantifiable outcome: Games have a quantifiable goal or outcome. At the conclusion of the game, a player has either won or lost or received some kind of numerical score. A quantifiable outcome is what usually distinguishes a game from less formal play activities.

(Salen & Zimmerman 2004: p.80)

Even though this is not a universally accepted nor a definitive definition of a game, it will provide a consistent frame to establish, whether a mode of virtual play can be interpreted as game play. Throughout this paper the term 'game' will have been determined to have fulfilled the requirements laid down in the prior guidelines. The purpose of this is to differentiate between alternate modes of play, which will be investigated further at a later stage.

Chapter 1

Reinforcement

As each section will be dedicated to discussing methodologies that effect a player's motivation within a virtual game, a preparatory overview of motivation will be made, setting the context for the proceeding sections of this paper. Motivation can be described simply as, to cause or stimulate an action. This is an overly broad assessment of the term however; everything in life requires a level of motivation. John Yager anecdotally describes this fundamental relationship between motivation and life in his book, '*Self Motivation*'.

“A hen can supply the necessary heat for an egg to be hatched but the chick has to come out on its own will. Only if the chick has the necessary will, vigour and motivation will it come out. No hen can supply these qualities. This in-built motivation is the most characteristic attribute (and natural too) of a living creature. It is the root cause by which this entire world functions.”
(Yager 2006: p.3)

Within the context of a virtual game the systems of motivation function outside of natural drives to survive. Within this section, the methods that are incorporated to encourage an individual to enter into a sustained state of play within a game will be explored. Poole raises the question of, 'what keeps him playing? Well, psychologists have applied the term 'reinforcement' to denote the fact that, in the anticipation of more reward' (Poole 2001: p.184)

Bandura states that ‘when a given response is followed by a positively reinforcing consequence, it increases the likelihood that the response will be repeated on the subsequent occasions.’ (Bandura 1969: p.217)

This is the core foundation of understanding of reinforcement and its applicable role as a means of encouraging a player’s response. When placing this within the context of a game its application is clearly discernable, whether due to an unintentional adherence to certain unspoken conformities, or as a part of a calculated structure is irrelevant, as its effect would remain the same

Sensory reinforcement

In a retrospective analysis of older virtual games such as, *Pong* (1972) reinforcement’s role may be viewed at its most simplistic. With each time the square representation of a ‘ball’ passes the player’s avatar, which is represented as a panel in this instance, it confirms the relevance of this action through an auditory response in the form of a bleep. When a player is either able to reflect the ‘ball’ past his opponent’s panel or vice a versa, the scoring system adds a single point to the victor’s score. This creates a visual reinforcement or provides negative reinforcement acting as a punishment, for failing to successfully reflect the ‘ball’. This method of auditory and visual feedback acts as the core set of founding principles, that govern reinforcement’s implementation within virtual games.

The aforementioned role of reinforcement can be viewed as a means to inform the player to the games rule set, as clearly printed on the *Pong* original arcade machine ‘Avoid missing ball for high score.’ (Kent 2000: p.34) With each desired action within game play being reinforced, it produces a means to convey and reassure

the player of the relevance of their action, in accordance with the designed intention for the game mechanic.

As a simple means of play, *Pong* does not possess the multilayered sophistication available in later incarnations of virtual games. However, even so their implementation stays, at its core, consistent to these principles. An example of this is the later implementation of the rumble feature, which has been incorporated into game pads since 1997 with an attachable rumble pak for the *Nintendo 64* controller ¹, this allowed the pads to vibrate to create physical feedback. This has most commonly been implemented into games to imply for example, the ground being shaken, being shot or in some cases striking an opponent, which has become a common trait within most fighting games since the release of this feature.

All response within virtual games could be viewed as a form of reinforcement, as without the satisfaction of having an impact within game space; a player would lose interest quickly. For motivation to be maintained there is a requirement for the player to be able to gain from a play experience for its activity to be continued. Games are as conveyed by Raph Koster; ‘exercises for our brains. Games that fail to exercise the brain become boring. This is why tic-tac-toe ends up falling down-it’s exercise, but so limited we don’t even need to spend so much time on it. As we learn patterns, more novelty is needed to make the game attractive.’ (Koster 2005: p.38)

When applying this to *Pong* it is clear that such a simple game mechanism would find it difficult to maintain the interest of the player for large amounts of time. However, this simple mechanic has fascinated millions invoking hours of play. ‘Upon its original prototype release in, ‘Andy Capp’s Tavern’ groups of individuals were found waiting outside just to be able to continue playing the prototype of this game.’ (Kent 200: p.37)

As according to Raph Koster, this continued motivation to play should be beyond a game that can be quickly mastered. However, Al Alcorn the designer of *Pong* implemented a system into the game, where as the rally of the square representation of a 'ball' continues, its speed increases incrementally, adding to its difficulty and in doing so lengthens play as new challenges are posed with lengthened play. Loftus and Loftus notes that; 'behaviour that is followed by reinforcement will increase in frequency. In short, video games that do something to make a player feel good will be played again and again.' (Loftus & Loftus 1983: p.14)

Reinforcement schedules

Virtual games as like all modes of gameplay must pertain to their predefined rule sets; this is relative to the systemic way in which a game is capable of delivering its modes of reinforcement. This can be initially assessed as there being two core systems of reinforcement, continuous and partial. These will be examined further in the later sections of this paper.

Continuous

Continuous reinforcement as its name suggests, is where the player is rewarded by a system where an action provides consistent reinforcement. (Loftus & Loftus 1983: p.16) This is most commonly used for initially moulding new behaviours. The Skinner box is a product of this intention. This device is used to alter animal behaviour, by using a lever or key the animal can operate the device to traditionally deliver food pellets. This is continuous reinforcement, which is the first of three sections of Skinnerian training; a term derived from this device ². There is the opinion

that this schedule of reinforcement has limited potential for maintaining player interest, as illustrated in the following quote by Poole; 'if a game provides continuous reinforcement, then it is too easy and boring. If, on the other hand, it's too hard, there won't be any initial reinforcement and this no reason to keep playing'. (Poole 2001: p.184)

This statement however, is too much of a generalisation, and it does not take into consideration the underlining actions that require a continuous reinforcement schedule. It may not be the optimal choice in all instances to use continuous reinforcement when rewarding the player in the grander scheme of the game, for example when the player receives new weapons, upgrades or Full Motion Video (FMV) sequences, this will be discussed in further detail when analysing value established through reinforcement schedules. Although a continuous reinforcement schedule is a necessary system for reinforcing minor actions, which may include sounds and animations that are required to occur consistently.

A possible example of this in the context of a First Person Shooter, (FPS) would be when a player presses or holds down the fire button when a ranged weapon is equipped and loaded. During this action there is an expectation of a set of reactions though the context of the situation; the sound of gunfire, the small flashing blast animation from the end of the barrel and the collision of the bullet; unless it has been fired at a surface out of visual range. All of these responses act to inform the player that their actions have had consequence within game space. Even though these responses to the player's action may vary in its artistic treatment, which could be due either to the designer implementing variations or having separate treatments for different circumstances, the reactions still need to be communicated consistently, so

that they can be interpreted by the player as the same response, which acts as a part of a continuous reinforcement schedule. (Crawford 1984: p.19)

Partial Reinforcement

‘Partial reinforcement is a system whereby the player is intermittently reinforced.’ (Loftus & Loftus 1983: p.16) This can be either on a random basis or as a part of a constructed ratio schedule.

Implementing this method of reinforcement creates a pattern of longer periods of gameplay without a reward being given. This encourages the player to continue playing for longer without being rewarded regularly; ‘by doing this the player is conditioned to expect fewer rewards over longer periods of extinction, making players more resistant to extinction as a whole this has been dubbed partial reinforcement effect... The decline and eventual cessation of behaviour in the absence of reinforcement is referred to as extinction’ (Loftus & Loftus 1983: p.18)

This form of reinforcement can be implemented for any reward structure where the outcome can be inconsistent, unlike a continuous schedule, which is used to create a pattern that the player through association will use to establish a definite understanding of the space and its rule set.

A partial schedule is used for what could be deemed actual rewards within a game. These could include when an FMV sequence is played, or when a specific item is collected from a defeated enemy. It provides variety for the player by adding in a variable element

If partial reinforcement were to be implemented in place of a continuous schedule, the inconsistency of the action could disturb the player’s understanding of

the space. If for instance a player were to shoot a target enemy and its health bar decreases, then on the subsequent shot the health bar is unaffected, this could disturb the player's interpretation of the congruency of the games rules set. This does not necessarily mean that a partial reinforcement schedule could not be used in this instance; in *Gears of War* (2006) no life bars have been implemented to convey an enemy's level of health. The player instead is invited to interpret the amount of damage dealt, by the reaction of the target. This visual feedback can be understood through its contextual framework, and therefore is able to be delivered through a partial reinforcement schedule.

However, during the final boss fight in *Gears of War* no feedback is provided until his health has been entirely depleted, up to this point round after round of damage can be dealt with no visual response from the opponent, there is absolutely no way of interpreting whether damage is being dealt. If the boss alternatively were to respond in the initial phase of the encounter after a certain amount of damage had been inflicted; then this feedback would be sufficient to ensure that a player understood the rules of the situation that they are engaged in. In both examples given above, partial reinforcement would have been provided as a part of a fixed-ratio schedule, this is one of four subsidiary ratio schedules that are formed to create, a consistent means of regulating partial reinforcement. These are as listed as follows:

Ratio schedules

- **Fixed-interval schedule**
 - A schedule in which a fixed amount of time must elapse between the previous and subsequent times that reinforcement is available.
- **Variable-interval schedule**
 - A schedule in which a variable amount of time must elapse between the previous and subsequent times that reinforcement is available
- **Fixed-ratio schedule**
 - A schedule in which reinforcement is provided after a fixed number of correct responses.
- **Variable-ratio schedule**
 - A schedule in which reinforcement is provided after a variable number of correct responses.

(Rathus 2004: p.251)

Each of these schedules can be implemented to provide variation within a game, in turn adding a layer of complexity to an experience.

Partial reinforcement is recognised as the most powerful means to establish behaviour that is most resilient to extinction. However, for this to be as effective as possible the designer needs to implement the most addictive ratio schedule to captivate the player. In the following section the roles that each ratio schedule can be implemented into a game will be discussed.

A fixed-interval schedule relies on a set amount of time passing, before the subsequent reward is provided. As this is controlled to a specific time it tends towards the nature of continuous reinforcement, providing a consistently regular delay between instances of specific rewards. This can most generally be found in games,

where an interval schedule has been used to create a time delay between the recurrent uses of a specific attack. This could include something as simple as a reload for a weapon or the recharging of a special attack before it can be used again. An example for a fixed-ratio schedule was provided previously. It is unusual that a game would provide a reward of significant magnitude through a fixed schedule, as rewards would become too predictable. These fixed schedules have been best implemented to cover aspects that convey a part of a games rule set, rather than reinforcement aimed at motivating the player to engage with the game for longer periods of time. Loftus & Loftus determine that, 'it's to the designer's advantage to design a game that reinforces the player on the most addictive schedule possible. And this usually turns out to be a variable-ratio or a variable-interval schedule.' (Loftus & Loftus 1983: p.19)

Variable schedules on the other hand provide something far more powerful by varying the amount of time between instances of reinforcement; through this the player will be conditioned to interpret long absences of a given reinforcement as standard. However, as this is provided in a variable way the player is able to be kept on their toes, unsure of exactly when the next instance of reward will be provided.

In *Final Fantasy X* (2001) (FFX) the games central reward structure is implemented through the use of FMV sequences furthering the story line, these are set at specific key stages throughout the game. To reach each key stage the player must spend a variable amount of time in traversing the game space. As the action of completing the game is time based, rather than relying on the number of enemy encounters, this does not include the mandatory boss fights that must take place to proceed through the game. The speed of the avatar's movement is a constant, and so

when aiming to move forward time is the cost of the progression. There is also the ability to prevent the random encounters by equipping one of your party with a specific piece of armour, and even then the player is still able to continue through the game. This shows the games core reward structure to be a part of a variable-interval schedule.

Progression through FFX also requires the player to increase the level of their characters by successfully defeating opponents in a turn based combat system, which provides enemies on a variable-interval schedule, referred to in the game as ‘random encounters’. Even though there is a predefined number of Ability Points (AP) that the player must attain prior to reaching the next level. This is only achievable through successfully defeating the games randomly spawning enemies; each specific type providing a varying level of AP for the player. With AP varied by different types of opponent and equipped weapon abilities (Piggyback Interactive 2002: p.144), this clearly shows that the process of levelling is under a variable-ratio schedule, confined within a fixed-ratio schedule, as there is a set amount of AP required to reach each subsequent level.

Within this topic the varying uses of each schedule have been discussed however, the time frames that are involved have yet to be outlined. The spacing between reinforcement is a critical topic in itself, as if the period of time is too long the player will lose interest, if it is too short the value of the experience will be compromised. For this a designer needs to establish the value of the reward against the cost a player will face in attempting to attain it. Further discussion on this topic will be made later in this paper.

Chapter 1 Notes

1 - http://en.wikipedia.org/wiki/Rumble_Pak

2 - <http://www.encyclopedia.com/doc/1O87-Skinnerbox.html>

Chapter 2

Even though the modes of reinforcement incorporated into the game structure are capable of providing a player with sufficient motivation to see a gameplay experience through. There are also alternate branches that need to be considered and that is the player themselves. As the levels of complexity of games have expanded over previous years, it is currently at a point where a player can find their own modes of intrinsic reinforcement, within a game's available mechanics. Equally there is also reinforcement that can be provided from other individuals and external sources from the game itself, coined as extrinsic reinforcement. Both intrinsic and extrinsic reinforcement have a part to play, even though both function externally from the game, to a degree a game can still influence and affect these modes of reinforcement.

Intrinsic reinforcement

Andrew J. Elliot and Carol S. Dweck refer to this as '*intrinsic value*'. 'I reserve the term "intrinsic value" for either the enjoyment that one gains from doing a task or the anticipated enjoyment one expects to experience while doing the task.' (Elliot & Dweck 2005: p.111)

Even though the terminology that Andrew J. Elliot and Carol S. Dweck have used varies from the terminology in this paper, there is no difference between their interpretation of the meaning of intrinsic value, and the interpretation that has been reserved for intrinsic reinforcement within this paper. This variation comes from a fundamental disagreement with the application of the term value. Value is essentially intangible, only existing conceptually, while reinforcement is in some part bound to a form of tangibility, whether it's just a pixel on a screen or the splash of light from a firework shimmering in the sky only for an instant. In some part reinforcement must

exist within the world in one form or another. If a sense of enjoyment is achieved there is a physical set of reactions that must have occurred on a bio chemical level. In regard to this, it is more appropriate to use the term reinforcement rather than value in this instance. (Baumlera 1975: p.22)

To continue on from this intrinsic reinforcement, is when a player generates a personal level of value for an action or experience within a given game situation. All actions are at some level motivated though intrinsic reinforcement however, behaviours that are principally based on intrinsic reinforcement rely on a player's sense of personal satisfaction, rather than receiving external reinforcement, or having reinforcement provided predominantly from the game, in response to their action.

This can be found in a variety of activities that players enter into while engaged in game space. For any interaction there must be some intrinsic value to the task that motivates the continuation of the activity. The role that value plays will be discussed in further detail at a later stage of this paper.

A consideration for this is that the game is no longer being played; rather the game's mechanic itself is being played with, by turning the mechanic into a toy.

- “With a toy, it may be difficult to say exactly when the play begins and ends. But with a game, the activity is richly formalised. The game has a beginning, middle, and a quantifiable outcome at the end. The game takes place in a precisely defined physical and temporal space of play. Either the children are playing Tic-Tac-Toe or they are not.” (Salen & Zimmerman 2004: p.95)

With this it is hard to determine how long specifically a game is actually played, against the amount of time a game's mechanic is being played with. If hypothetically in the middle of a game of chess, a player were to pick up three pieces from the board and were to start juggling them, it could defiantly be considered that a player was still engaged in the act of play with the assets of the game however, through no interpretation of the formal rules of chess could it be considered, that the player was engaged with the act of playing the game itself. This may seem obvious in the context of a non-digital game however, when this comparison is placed within the context of a virtual game, the lines between modes of play blur far more easily.

For this the term 'translunate' will be coined. This term is a amalgamation of the words 'transition' meaning to change states and the Latin word 'ludus' for play. This new term will be used to describe the dynamic nature of how an individual, seamlessly transitions between forms of play, ergo to translunate.

Any asset within a game is just an object, and only during play is its function defined. Even if an object has a clear purpose within the game world, a player is not always under the obligation to use the object as the designer intended. As within the current generation of games there is ample flexibility for how an object or mechanic can be played with. An example of this isn't extravagant in fact most often it's simple behaviours within the game space. These types of behaviours are demonstrated in the following examples; during *Gears of War* a player may attempt to shoot their name into the wall before the alpha planes that represent the bullet holes reach the games maximum capacity, and are subsequently deleted or in *Drakan: Order of The Flame* (1999) after an opponent is defeated commencing to slash at the carcass until it explodes into gory chunks, then the player proceeds to kick the pieces around before they disappear. These interactions become a translunation engine providing the player

with an opportunity to take it upon themselves to define the terms of play surrounding the interaction.

More often than not these behaviours lead the player to take a greater lusory attitude to gameplay. A lusory attitude is simply a behaviour that follows rules that would seem counterintuitive outside of the context of the game.

“...an extremely effective way to achieve the prelusory goal in a boxing match – viz., the state of affairs consisting in your opponent being ‘down’ for the count often – is to shoot him through the head, but this is obviously not a means for winning the match.” (Suits & Hurka 2005: p.9)

The examples provided in this paper above, portray interactions within game space that serve no benefit to the progression through the game itself. However, this permits the player to play with a feature within the game. This ends up in transforming an existing mechanic of a game into a toy. (Adams & Rollings 2006: p.4) Even though the game is no longer being played; value and reward are still being maintained. A player won't necessarily make the distinction that their interactions aren't a part of gameplay, as they remain confined within the game space. Consequently the player unknowingly transitions between gameplay and alternate modes of play. As defined in the introduction, there are fundamental requirements for play to be considered actual gameplay. Through providing a diverse and multilayered set of available interactions within a game world, a player can find systems of alternate modes of play, within that space to create pleasure from.

Consecutively creating a positive association between player and the game, as the reward received is highly intrinsic. This positive association of an experience will

encourage a player to promote the game itself, which then acts to encourage extrinsic reinforcement for other individuals through social reinforcement or peer pressure. (Dawkins 2006: p.129)

Curiosity and Intrigue

Both curiosity and intrigue rely on intrinsic reinforcement to sustain interest in a task. However, they are both situations that are created within gameplay, which requires a player to set the attainment value. The highest level of the implementation of these factors is most commonly used outside of core gameplay; this is due to their reliance on intrinsic reinforcement. Examples of this can be seen within a broad spectrum of games, such as *Windwaker: Legend of Zelda* (2002), where the player is given the option to travel around the ocean in search of islands. Even though on most of these islands there is some form of reward for the player's exploration, ranging from gold coins to additional heart fragments, which increase the avatars health bar, the games completion is not dependant on the collection of these supplementary items. This is a simple example of curiosity, a much more substantial case for this can be seen with narrative based games, such as the *Final Fantasy* series where the story is emphasised as a main selling point. (Salen & Zimmerman 2004: p.412).

By using highly rendered FMV sequences to convey story line, it acts as an incentive for the player, aiding in motivating play through the game. This can only account for a limited level of motivation due to its intrinsic nature.

Amorphous-plus (2007) is a web based flash game that attempts to motivate the player almost entirely by encouraging curiosity throughout play, a further system of motivation is established through the implementation of a high score table however, it

only acts as a personal record, which in this instance is of secondary importance to gameplay. The main motivation comes from unlocking the one hundred and ten hidden awards, each ten of these that are unlocked provide a key, which in turn can be used to unlock one of twelve hidden rewards. This simple '*hack and slash*' game can be completed numerous times in '*Single Nest*' mode, where the player is set against a specified number of opponents in one of the three available sized nests, or can fight against an endless stream of opponents in '*Bounty Run*' mode. As there is no significantly unique reward for completing any gameplay mode other than unlocking awards. The core reinforcement structure relies on the player's curiosity, of what awards and rewards there are available to be unlocked. An interesting addition to the rewards available is the inclusion of a final reward behind a platinum lock. By showing that a special reward is obtainable, on the condition of fully acquiring all of the available awards in the game, ensures the player of reinforcement and so strengthens the motivation for completion. This single act helps to prevent players from abusing the game system, which could be done by resetting the game, so that ten easy awards could be collected leaving the player able to cycle through all of the available rewards by repeating this system. As all the game modes are made available from the start, their completion could be considered to be of minor importance and instead collecting the one hundred and ten awards would act as a measure of completion.

This poses a problem as the reward curve for this game peaks early on in the experience, as easy awards are attained quickly. Around half way through collecting the rewards the pace of receiving awards diminishes, only the final reward is truly

unique, and so is the only remaining substantial reinforcement that motivates the player to fully complete the game.

“With a very long interval between reinforcement, the person has no way of being sure that the reinforcement drought is ever going to end. He or she may actually give up playing.” (Loftus & Loftus 1983: p.18)

Games based on curiosity such as this have a problem, as each additional achievement will either become more obscure or difficult to attain. As the game progresses the rewards will taper off and a player may lose the motivation to continue, as the cost begins to weigh more heavily against the available reinforcement.

In design terms curiosity seems to be capable of adding a dimension of motivation, for the player that requires very little resources by the developer to implement, but as *Amorphous-plus* has shown this system of curiosity based gameplay is capable of sustaining a player over substantial sections of gameplay. Though, this may not be capable of motivating play for the full extent of the game, as rewards begin to taper off.

Extrinsic reinforcement

The term extrinsic reinforcement has been reserved in this paper for actions that create motivation external to the game itself, whereby additional motivation can be provided from outside sources. This can be derived through a variety of circumstances ranging from high score tables, peer pressure, winning tangible prizes or to being included in the *Guinness Book of World Records*. All of the aforementioned examples

are methods of extrinsic reinforcement, some of which are too external from the actual game itself to be discussed within the limitations of this paper. External motivators such as prizes or notoriety are outside of the games sphere of influence and will be excluded from further discussion. Though score boards and peer pressure can be influenced through the game itself. Due to this there will some level of discussion covering these aspects.

Social Reinforcement

In some cases motivation for play can be derived from the games ability to act as a catalyst for social lubrication.

“Games are frequently used (especially by adults) as social lubricants. The game itself is of minor importance to the players; its real significance is its function as a focus around which an evening of socializing will be built.”
(Crawford 1984: p.17)

A player receives this form of reinforcement through the social interaction, which is facilitated by entering into a game’s ‘magic circle’ with other individuals.

This demonstrates that a game’s modes of reinforcement may have secondary importance in certain circumstances, compared to those generated between individuals engaged within a specific gameplay system.

However, in some instances the level of reinforcement received may be proportionate to that earned through gameplay.

This is a key aspect in the longevity of casual games, such as *Guitar Hero* (2006). This game possesses a high social value to the activity, which acts to encourage lengthened playtime, as the game itself provides a simple yet effective means of reinforcing the player. ‘One of the major goals of game design is the old easy to play hard to master chestnut’. (Croshar 2009) These systems of reinforcement are highly likely to overlap, and the social side is likely to result in a higher level of value being placed on the game rewards. The overall effect is that the game system ends up providing a highly addictive experience. The popularity of the game is summed up with the announcement by Activision publishing CEO Mike Griffith during his keynote address at CES;

“*Guitar Hero* franchise had surpassed \$1 billion in North American revenues (a feat accomplished in just 26 months). Now *Guitar Hero* has reached another important milestone, as *Guitar Hero III: Legends of Rock* has become the first ever game to generate \$1 billion in sales.” (Brightman 2009)

The alternate to this form of social reinforcement is resultant from peer pressure, which has its own role in encouraging the initial engagement with a mode of play. This pursuit of social acceptance leads to a higher value being placed on reinforcement from an individual’s peers. Meaning, that there is a provision of reinforcement not only from the game, but also from others prior to its engagement, in turn, showing how modes of reinforcement can not only be established outside of game space, but also prior to game play.

Initial Reinforcement

Initial reinforcement within this section will cover the methods of creating motivation for a player, to initially engage with a form of virtual gameplay. Raising the question of what revenues can be exploited within a game to motivate those outside of the games magic circle, into choosing to begin a specific mode of play?

Recapturing a positive experience

Firstly, there is an attempt to recapture a positive experience. To this end people become loyal in a sense to things that they believe make them happy. If for instance an individual enjoys playing a game, then this feeling of enjoyment is sought after, and the individual attempts to engineer a situation whereby to replicate a similar experience. This is something that is more prominent in the film industry, with numerous magazines and websites dedicated to following the lives of celebrities. This is reflected in some individual's loyalty to certain actors or actresses by following their lives and careers. (Staples 2006: p.368) For whatever reason there is the underlying belief that something is being gained from this loyalty, whether it's the enjoyment of watching an individual perform, an admiration of their life or merely for someone's physical image, all of which relate to that individual's success in the minds of their followers. (Maxwell 2007: p.80)

Opportunity to explore personal interests

It is in the aid of creating a venue for exploring player behaviours, that Richard A. Bartle investigates player types in his book *Designing Virtual Worlds*, listing eight specific varieties, which are depicted in the diagram below;

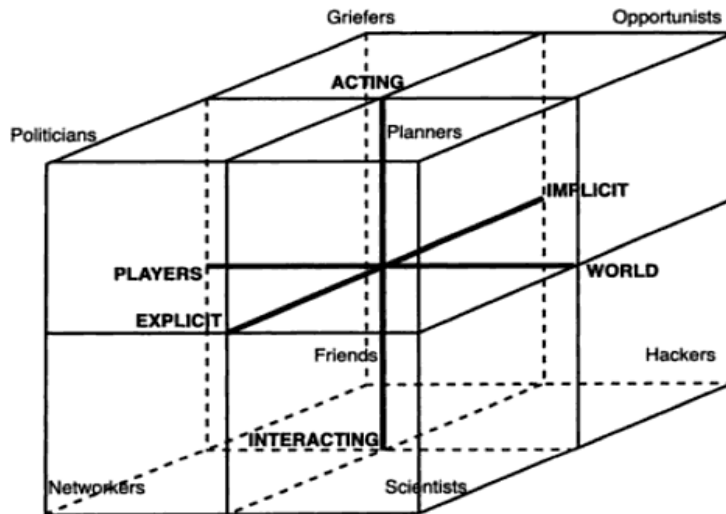


Figure 1.0 3D Player Interest Graph.

(Bartle 2003: p.169)

Bartle's model covers modes of behaviour that a player may enter into when an opportunity to do so is provided. Though not all players will necessarily enter into every role listed during their experience within a game, though at any one time a player will most likely be engaged into one of the roles Bartle depicts above. Bartle's terminology will not be described further, as the specificity of the terms are not required for this paper.

The terms provided above currently, are based on the assumption of being a part of an online game, with the ability to facilitate for a virtual community. What Bartle is clearly showing is that there are archetypal behaviours that people will enter into. This is important, as it creates a frame of terminology that can be implemented to create opportunities, to accommodate for the largest player base. In doing so allows a player to not only explore a venue that currently interests them, but is able to shift through

different modes of behaviour dynamically. Now as discussed so far, these are all clearly systems that affect a player only during gameplay. However, there is an opportunity to escape this confine to affect individuals outside of those already engaged with the game media. By increasing the level of diversity in this way within a game, increases the probability that the game will be enjoyed by a wider spectrum of individuals.

This covers the instances of interaction within a game, which can create opportunities for an individual player to find a suitable mode of reinforcement, though there are other means outside of interaction that can create a potent system for intrigue. As people learn through associations there will always be a preference affecting an individual, early on this is more likely to be a preference to a genre of game, something that is easily distinguishable in the early phase of introduction to the media. As time passes further preferences linked to virtual games may emerge, an interest in a particular artistic style, developer or even publisher. What in the end this comes down to is based on past associations, something more visibly developed in the film industry, with fans of directors and actors watching their latest movie releases', in an attempt to follow their working careers. When an individual associates with something positively they will actively chase that initial sensation, searching for other instances promising a similar experience or just providing the premise of possibility that a similar experience will be provided. Peer pressure can influence this situation, whereby an individual will promote their positive experience to others and may influence them to engage with a particular instance of game.

This becomes a part of a system of memes, this term coined by Richard Dawkins in his book, *The Selfish Gene* is a word adapted from the Greek word *mimeme*, meaning something that is imitated.

“Examples of memes are tunes, ideas, catch-phrases, clothes fashions, ways of making pots or of building arches. Just as genes propagate themselves in the gene pool by leaping from body to body via sperms or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via a process which, in the broad sense, can be called imitation.” (Dawkins 2006: p.129)

This is the spread of ideas through various methods from advertising to public relation events; this is the hype that surrounds any game.

The current games industry directs large amounts of time and energy into following current consumer buying trends, in an attempt to follow popular culture. In doing this a considerable number of developers/publishers endeavour to tap into a larger market, in some cases ignoring the novelty which was encountered in the first popularisation of a trend, which will have only existed for a brief moment and after that individuals will have a sense of brand loyalty. *Guitar Hero 3* as mentioned previously is the highest grossing game of all time, *GTA IV* (2008) made over five hundred million dollars in sales in the first week of release. (Crecente 2008) Breaking *Halo 3*'s (2007) previous world record of three hundred million dollars. What can be clearly seen is these records are only being held and broken by sequels.

Activision's CEO Bobby Kotick speaks on behalf of Activision for their recent dropping of several game titles that did not possess sequel potential

"With respect to the franchises that don't have the potential to be exploited every year across every platform, with clear sequel potential that can meet our objectives of, over time, becoming \$100 million-plus franchises, that's a strategy that has worked very well for us,"(Jenkins 2008)

This is in the pursuit of reaching the largest target audience and constructing a fan base that can be exploited to promote the experience to others. There is however, an equal likelihood that if a negative experience is had, this will be promulgated just as effectively by an individual. Since the original *Tomb Raider* (1996) there have been eight sequels to date (2009). Even so this title has in no way reached the broad fan base that other titles have. With Eidos recently announcing disappointing sales of the newest iteration of the series (*Tomb Raider: Underworld* (2008)) resulting in the company substantially lowering their annual predictions. (Jenkins 2009) This is a prime example of how releasing sequels consistently, will not guaranty that a game will be successfully received on every iteration.

Chapter 3

Value

There has been some mention of value in the prior sections of this paper however; this is a critical topic in relation to understanding the magnitude of specific modes of reinforcement on the player, to the degree that this subject needs to be fully explored. Without value reinforcement is meaningless. Firstly, how reinforcement is evaluated needs to be established, for this researchers Eccles and Wigfield created a model to portray how value is evaluated, this is broken down into four key factors according to their model:

- attainment value; significance of the outcome,
- intrinsic value; interest in or pleasure derived from the actual task,
- extrinsic utility value; usefulness for attaining other goals,
- and cost; effort, time, and risk involved.

The first three values have a positive correlation with motivation and the last has a negative correlation. The combination of these components determines the value attributed to a task. (Oxland 2004: p.66)

From this model an interpretation can begin to be made on how an individual creates levels of value within an experience. This will be approached by discussing the link between Eccles and Wigfield's model and expectancy-value theories.

“Expectancy-value theories are currently speculated that an individual’s motivation is based on two elements, the expectancy of success in the given task and the value that the person places on the successful completion of the task.” (Oxland 2004: p.66)

This can be seen as a presumptive measure by an individual of assessing the cost and the attainment value for completing the task. This provides an additional element to take into consideration, that a player will have an inbuilt presumption of their abilities. Zoltan Dornyei, lists three processes that cumulatively form a process whereby an individual will evaluate their belief of success. ‘The processing of past experiences (attribution theory)’, judging one’s own ability and competence (self-efficacy theory), and attempting to maintain one’s self esteem (self-worth theory)’ (Oxland 2004: p.66)

If the expectancy for success is too high it would be conducive to there being no challenge in the task and in some instances lower motivation. As mentioned in the earlier sections of this paper a game needs to provide a challenge. A player that is capable of successfully completing a *Guitar Hero* track on hard mode; is unlikely to consider playing on easy mode, as there would be no challenge generated by doing so. Both attribution theory and self-efficacy theory account similarly for how an individual would evaluate the expectancy of success.

Self-worth theory accounts for the ways in which an individual will seek to maintain a level of self-esteem. By attempting to maintain this, there is an increased likelihood an individual will refrain from entering into a scenario, where ridicule may be received or that regular failure will be encountered, which could challenge someone’s assessment of their own value. Whereby a player will have a preference to do what

they know they are good at, there are some instances in which a task may only be attempted within the safety that privacy provides.

Both value and expectancy of success have been summarised to create a basis for discussion on this topic. This is a difficult subject to broach as the level of subjectivity on this matter is fairly high. Whereas one person would extract value from beautifully rendered FMV sequences to motivate play, another may evaluate an experience based solely on the quality of its story line. This shows that there is no means to quantify value universally.

The researcher Susan Savage-Rumbaugh currently studies an ape called the Bonobo. Through her teams research they have shown the Bonobo, who have had no training, and acting purely on their own interests playing Pac-man. There are a number of motivators that could be investigated for this scenario however; evaluating the level of value the Bonobo placed on the experience would be far too speculative, for an interaction that possessed only intangible rewards other than, providing stimulation for the mind. (Rumbaugh 2009)

The concept of an ape playing a human game crosses conventional assumptions and generalisations that are made when regarding human behaviour. This encourages us to question the beliefs of understanding that we place on the methods, if any to quantify intangible reward and the value that is subsequently generated. By doing this it portrays the difficulty of creating a universal model for assessing value.

Taking this into consideration it is possible to be able to evaluate whether a reward is being provided efficiently within a game. By assessing what lowers the value of a reward, an understanding can be made more clearly, of how to maintain the highest level of value from each instance of reinforcement.

Devaluing Reward and Cognitive dissonance theory

So far only the compelling nature of reinforcement has been outlined. However, in some instances what may seem as positive reinforcement, has been shown to actively lower an individual's enjoyment of a task. This is the first part of determining how value can be maintained. Individuals can interpret an experience as more enjoyable if there is less reinforcement. The following example given by Geoffrey R. Loftus and Elizabeth F. Loftus; 'Games may be more reinforcing, not less, if you have to pay for them.' (Loftus & Loftus 1983: p.27)

This paradoxical behaviour was investigated by Leon Festinger and his team over the course of the mid 20th century, into what they later dubbed as cognitive dissonance. An adequate example of this can be taken from Festinger and Carlsmith's experiment where;

“A group of people performed a repetitious, tedious, and thoroughly boring task. After completing the task, the group was asked by the experimenter to lie to a new group of people- to tell them that the task was more fun than it actually was offered only \$1. Finally, after the lies had been told, the people were asked to rate how much they enjoyed the original task. It turned out that, contrary to what you might expect on the basis of reinforcement effects, the \$1 group claimed to like the task much better than did the \$20 group.” (Loftus & Loftus 1983: p.27)

As Loftus and Loftus note from this study that 'if there's extrinsic reinforcement, as there was for the \$20 group, that's fine. But if there's insufficient extrinsic

reinforcement had to be generated – the subjects had to decide that the task was more intrinsically fulfilling.’ (Loftus & Loftus 1983: p.27-28)

Over reinforcement

If these research conclusions are to be taken as true there needs to be a method whereby reinforcement can be evaluated. For this it will be important to establish what the consistent reinforcements are within a game, and what constitutes secondary reinforcement. There is the primary action itself, and then in response to that action there is auditory and visual reinforcement that will be made consistently throughout a game. However, on top of these there can be additional instances of reinforcement that are external to the consistent elements. This could according to supporting evidence in behavioural psychology lower the cognitive dissonance which, in turn lowers the overall enjoyment of the task. This may appear in a variety of circumstances, the first of which is by the designer over reinforcing an action, resulting in what appears as a patronising effect on the player.

A possible example of this is in *Fable II* (Lionhead, 2008) within the starting stage of the game the player is required to collect five coins, on each occasion when collecting one of these coins there is a flourish of sound, virtual sprites, as well as being annotated to the bottom right of the screen, until the task is complete. Also, your sister in the game then proceeds to tell you that you have collected a coin. There have been sufficient cues to signify the action itself, the additional reinforcement in the form of literally being told, lowers the possible cognitive dissonance that would have been derived from the activity. In this case there was very little reinforcement needed. The implementation of this additional form out balances the action, and in turn can

become something that patronises the player. This is an extreme instance, as it occurs only within the tutorial section of this game. But illustrates that there needs to be a balance between reinforcement, and the effort that was required to achieve it. *Metal Gear Solid 4: Guns of the Patriots* (2008) rewards the player with constant FMV sequences throughout the game. The average completion time is around 3 hours of gameplay with over 10 hours of FMV sequences. This out balances the gameplay and so lowers the value of the reinforcement of acquiring any FMV sequence. Compare this with *Final Fantasy X* that can provide over 100 hours of gameplay, with only a dozen or so cut scenes, not totalling more than an hour of cumulative play time. Scarcity in itself generates value;

“the Final fantasy series’ game play is often driven by this imperative, whether trying to advance through the game to see the next cut scene in the story, or trying to find the magical ‘summon’ spells within the game, which a lot of people have noted are primarily worth finding in order to enjoy the spectacular animations which accompany them.” (Salen & Zimmerman 2004: p.411)

Magic Circle

These values are constituted by the player, while apart of what has been dubbed the games 'magic circle'. Katie Salen and Eric Zimmerman provide a simple means in which the concept of a games magic circle can be described; 'in a very basic sense, the magic circle of a game is where a game takes place. To play a game means entering into a magic circle, or perhaps creating one as a game begins.' (Salen & Zimmerman 2004: p.95)

Due to the intangible nature of entering into gameplay, it is instrumental in a player's understanding of such an experience to have an equally intangible boundary around any given game. It is within this conceptual bubble of play that a game is able to create meaning to action, which a player can interpret and assign the level of value. (Adams & Rollings 2006: p.7) Without the contextual placement within game space, the incremental numerical increase of the scoreboard is nothing more than an addition system.

"The games designer Brian Moriarty refers to the concept of becoming engaged with a game space as entrainment, derived from the French word 'entrainer' which possesses a dual meaning of: to carry along, and to trap. It is the process of falling into a patterned activity, such as when baseball fans spontaneously create a stadium wide "wave" in a co-authored, massively multiplayer spectacle." (Salen & Zimmerman 2004: p.341)

It is this draw to a specific desired experience that is a key factor in the motivation to enter into a particular mode of play. As each player's value for any given activity varies and is specific to that individual. Chris Crawford sums this statement up by his example of:

“If a player is motivated to play a game for mental exercise, that player will probably prefer those games that offer better mental exercise than do other games. A game cannot be fun if its factors do not satisfy the motivations of the player.” (Crawford 1984: p.17)

In this respect a player must be willing to first to enter a games magic circle for its modes of reinforcement to be able to have any effect. In this stage, reinforcement has no means of contribution to this initial motivation for a player's interest in the game.

Conclusion

From the topics that have been covered in this paper previously, a summation of their interconnected relationship to generating motivation will be outlined within this final section.

When implementing a system of reinforcement two key schedules have been identified, these are continuous and partial. In defining a virtual world's boundaries, having the regularity of a continuous schedule develops both clarity and consistency for the space. While any major reward it would seem, is most effectively placed within a variable ratio or interval schedule.

By withholding the exact conditions for receiving the next instance of reinforcement, a player is kept guessing as to when the next major reinforcement will be provided. This system overall has been shown to be the most highly resilient to extinction. In between key instances of reinforcement additional smaller forms of can be implemented to substation a player's motivation. During gameplay the greater the contrast between levels of reinforcement that are provided to the player, will directly correlate to how powerfully a player responds to them, and to what level a player evaluates their value to be at.

However, it has been made evident that play can act as its own reward structure, outside of what would be considered to be gameplay. It is possible for a player to transition in and out of modes of play seamlessly, never distinguishing between the mode of play that is actually being engaged with at any one time. In this regard it can be to the designer's credit, to account for the possibility of assets within the world acting a *transludation* engine for the player. The benefit from encouraging a playful attitude to gameplay in such a way, is that the player will create systems of

intrinsically generating value from interactions within the game space, that otherwise had very little intended reinforcement from the perspective of the game's developer. From the possibility of providing a heightened sense of value within a game, there is in turn an increased likelihood that an individual will promulgate this positive meme.

This is only a summation of what has been covered in this paper however, this paper's goal was to create an initial study into the principles and theories under the heading of exploring the foundations of motivation, that are confined within a virtual games initial magic circle. Further exploration would need to be made into each previously outlined system; there are numerous facets of discussion that have yet to be covered. Such as what is the smallest reward that could motivate play for the largest audience? From there what reinforcement could provide the highest contrast that would create a reward that a player deemed valuable? How can time against reward be assessed? Will cognitive dissonance balance out a lack of value? How much could this effect compensate for a differential in cost against provided reward? This paper has provided an initial exploration, into the factors of motivation that can be generated and implemented through gameplay. Whereas this paper is clearly not a definitive break down of the issues surrounding motivation, the frame has however, been laid out for possible further discussion.

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