**Research Positive and Negative Feedback Loops**

Within games there are mechanisms known as feedback loops, there are two types of these loops – positive and negative feedback loops.

A positive feedback loop happens when the player does something, which causes that same something to happen again, then causing the exact same thing to happen yet again, getting stronger and stronger with each iteration – just like a snowball rolling down a mountain where it starts out small, but the more it rolls the more snow it collects creating a stronger and bigger snowball when it reaches the bottom.

As an example, think of a game where the player gets more power ups after each level is complete, but the player must gain a high score to acquire the power ups. This is a positive feedback loop: if the player gains a high score, the player acquires power ups for the next level, the next level becomes easier to gain a high score because of the power ups, which will give the player even more power ups, so on and so forth.

In the example above, the reverse is also true. Say the player gets a low score, meaning the player will receive fewer power ups for the next level, resulting in the next level being even harder to score high on, and so on until the player so far behind that they feel it to be impossible to ever win.

In the second example it may seem the player is experiencing a “negative feedback loop” because the players experience seems so negative, but this is not the case. Both examples are cases of “positive feedback loops” because the cause and effects become greater in magnitude over each iteration of the core gameplay loop.

A negative feedback loop is used in relation to a positive feedback loop, it’s a mechanic which can be implemented to help ensure the positive feedback loop doesn’t become overpowered or create an unbalanced game. When something happens in a game resulting in the player being locked into a positive feedback loop (such as one player gaining an advantage over another), a negative feedback loop helps to make it harder for the same positive feedback loop to happen again. If one player gains an advantage over all the other players, the negative feedback loop makes it easier for all losing players to gain back an advantage (and harder for the winning player to generate a greater lead).

Three important attributes of a positive feedback loop:

* They create a disengaging experience with no challenge, especially as the feedback loop grows stronger.
* Games tend to end quickly.
* An emphasis is put onto the early game, because the decisions made in the early game usually determine the overall winner.

Three important attributes of a negative feedback loop:

* They create stability, causing players to be more tightly compact throughout gameplay – creating a more tense and exciting game.
* Games tend to last longer.
* They put emphasises on the late game, since early game decisions do not contribute to the end game as much as late game decisions do.

Our team’s current iteration of the game “Super Sushi Showdown” only introduces positive feedback loops, which could prove to be a problem. Part of the brief for this project was to create a game that is engaging and creates urgency between two players, but by only including a positive feedback loop the game decreases the chance of meeting the brief fully.

Our current positive feedback loop starts when a player taps a piece of sushi that is parallel to the NPC who’s requesting that piece of sushi. When the player taps perfectly they steal customers/points from the opposing player. The objective of the game is to steal all your opponent’s customers/points to win, or have the most customers/points when time runs out to win.

If a player is highly skilled at the game they will be rewarded with customers/points after every tap, especially if they are playing against a lesser skilled opponent. This will result in matches that end quickly (due to the higher skilled player being able to steal customers/points in quick succession). This positive feedback loop could also help a player to become disengaged/bored (due to there being no challenge from the lesser skilled player). Also, no urgency or tension created in gameplay especially towards the late game (due to the higher skilled player having such a big advantage). The exact same can be said for the lesser skilled player. The losing player will be become disengaged, because they’ll feel it is impossible to gain back the lead and overcome their higher skilled opponent.

To overcome this fault within the game, it is vital to create a negative feedback loop that will help to create urgency, keep players engaged and help a lesser skilled player feel like they always have a chance to win.