# The Challenge of Symmetry

“One quality that players universally seek in games is fairness. Players want to feel that the forces working against them do not have an advantage that will make them impossible to defeat. One of the simplest ways to do this is to **make your game symmetrical, that is, to give equal resources and powers to all players.** […]If you want to put players in **direct competition with each other and you expect them to have roughly equal levels of skill**, symmetrical games are a great choice**.** They are particularly good systems for **determining which player is the best, since all things in the game are equal but for the skill and strategy that the individual players bring to the game.** […]In these games, **perfect symmetry is not always possible** as there is often some minor issue such as ‘who goes first’ or ‘who starts with the ball’ that gives one side a small advantage over the other. Generally, **random selection, such as a coin toss or die roll, is the solution**.” (Schell, 2015)

## Digesting Schell

* Symmetry = equal resources and powers to all players = equality of opportunity for the player
* Symmetry is good for direct competition and when players have a similar skill level
* As such, symmetry puts the game in a natural state of equilibrium where the only major differing variables are that of the skill and strategy possessed by the players
* Perfect symmetry cannot always exist
  + Questions such as “who starts first?” often deliver a level of player advantage
    - Going first in a card game such as Hearthstone, for example, is almost always advantageous even with balance considerations taken into place (second player starts with an additional card and a card that gives the player an extra point of mana for a turn)
  + The typical solution to this, however, is typically some form of random selection (e.g. coin toss, die roll etc…)

## The Bottom Line

* Symmetry is stated as a quintessential part of the brief; a level of symmetry is mandatory to achieve the objectives outlined
* As exemplified by our previous market research, the age, gender, experience and passion for games within our target audience differs dramatically
  + From this, it can be argued that the overall skill level of our target audience differs dramatically
  + Consequently, we cannot “expect [players] to have roughly equal levels of skill”
  + If a player isn’t challenged by a game, they become bored leave the flow state
  + If a player is finding a game too difficult, they become anxious and leave the flow state
* The bottom line comes down to the following:
  + **How do we keep players of differing skill levels engaged whilst also meeting the ‘symmetrical’ component of the brief?**

## Balancing Differences in Player Skill

As previously stated, a large design challenge on this project is going to be balancing the game so that players of differing skill levels will remain engaged. A previous idea floated by our group was to implement a dynamic difficulty adjusting algorithm that would identify the skill level of each player and adjust the difficulty appropriately. The issue main issue with this, however, is that it defies the ‘symmetrical’ objective of the brief. Consequently, below are some early concepts of mechanics that could balance the game. As expected, the below solutions require frequent playtesting to determine their successfulness.

## Brainstorming Solutions

* Do nothing; balance the game to be as close as possible to perfect symmetry; address minor advantages such as starting player through RNG as to not directly discriminate against any player
  + Given the simplicity of the ‘simple tap’ mechanic, this may work surprisingly well as game is not mechanically complex – anyone should be able to pick up and play. **Simplicity of the game naturally reduces the skill ceiling, bringing the level of any given players’ skill closer together.**
* Negative feedback loops
  + Gives an advantage to the losing player and allows them to get back into the game
  + Both players have the opportunity to benefit from this if they are in last place; it does not explicitly damage the winning player, rather aids the losing player
  + Potentially causes an issue where the previously losing player turns the game around and wins the game entirely due to the negative feedback loop (i.e. on an entirely even playing field, the player would have lost).
    - Can lead to players feeling cheated by the game; **why shouldn’t the most skilful player win every time?**
    - Schell – “Which is my important: that my game is a reliable measure of who has the most skill or that it provides an interesting challenge to all players?”
  + An additional consideration; at what point do negative feedback loops turn a game asymmetrical?
    - The inclusion of any negative feedback loop whatsoever immediately destroys the concept of pure symmetry, as the losing player is suddenly given an advantage; a way back into the game.
* Dynamically adjusting difficulty
  + This idea, previously mentioned above, is different to a negative feedback loop in the sense that, instead of rewarding the losing player, it punishes the winning player
  + In relation to our game, the idea was to give the less skilled player either more of a weighting to their ‘pull’ of the metaphorical rope, or permanently increase the duration of their timing window
  + Changing the weighting of player pulls undoubtedly pushes the game into asymmetrical territory
  + Adjusting timing windows could potentially work as a negative feedback loop, if only temporarily while a player is losing (the advantage doesn’t carry on if the player then starts to win)
  + Regardless, even if done invisibly to both players, punishing the winning player for being more skilful seems unfair and is asymmetric in nature
* Power-ups
  + The “Mario Kart” solution; both players have access to power-ups, however the more powerful power-ups are distributed either entirely or mostly-to the losing player
    - In Mario Kart the further behind a player is, the more likely they are to receive a better power-up, such as Bullet Bill or invincibility. As a player climbs up the podium and overtakes other players, the power-ups they receive get worse.
    - This is an example of a form of negative feedback loop, however in the case of our game this would also involve adding pick-ups as a mechanic
    - Addition of pick-ups as a mechanic causes further design challenges:
      * What items to add?
      * How many different items to add?
      * How to distribute those items?
      * How does a player activate their powerup?
        + Will the way in which this is implemented confuse the player and complicate what should otherwise be a “simple tap”