Path Reference Class Duality

by Sven Nilsen, 2019

Path Reference Class Duality is that it is that there exist two equally valid interpretations:

- Many-worlds interpretation where weights represent density of observers
- Single-world interpretation where weights represent chance from observer choice

For example, in Pascal's triangle the observer can make a choice to go either left or right:

```
          1
      1       1
  1       2       1
1   3       3       1
```

In the many-worlds interpretation, this means that most observers are located near the original location.

In the single-world interpretation, this means that the observer has greatest chance of making some choices such that it ends up close to the original location.

With other words, both interpretations give the exact same predictions under unconstrained conditions.

This has some non-trivial consequences for semantics: For every "weird" prediction made under one interpretation, there exists a corresponding prediction for the dual interpretation.

Natural/weird duality	**Many-worlds is natural**	**Many-worlds is weird**
Single-world is natural	OK	Favors single-world
Single-world is weird	Favors many-worlds	*What?!*

The obvious problem is that when both interpretations fail to match human intiution, one gets surprising predictions, yet there is no way to avoid them. One alternative could be to try a third interpretation where the same prediction has a natural interpretation.

Since these two interpretations have natural predictions given unconstrained conditions, the question remains what these interpretations mean under various constrained conditions.