Three things are needed in order for speciation to occur:

- Disruptive selection on a trait (in this case due to frequency dependence)

- Assortative mating

- A link between partner choice and selected trait (at first this is implied since magic trait)

Look at speciation dynamics if individuals can choose which resource to utilise based on perceived fitness.

Eco-evolutionary dynamics = interplay between ecological and evolutionary processes

Implement ecology and evolution on same time scale

Test robustness of classical ecological speciation models

Model set-up:

1 population of N individuals

2 resources of R1 and R2 size

Individuals have heritable ability X between -1 and 1 to utilise the resources

Initial X favours resource 1 (close to -1, say -0.8)

In random order, individuals choose which resource to utilise based on size of resource, number of other individuals currently present at the resources and their X (Ri/(Ni+1)\*e^-(X±1)^2)

When all individuals have chosen, resources are distributed across individuals present

Individuals utilise the resources and get a fitness (Ri/Ni\*e^-(X±1)^2)

Resources are refilled at the end of the generation

F females and M males in population

Females have a range CI they prefer their partners to be within

Initial CI is large (random mating)

Females are chosen semi-randomly based on fitness (weighted lottery)

Males are chosen semi-randomly based on fitness out of a pool of all males with X within X±CI

They create a female and a male with X the median of their Xs

Chance of mutation of X and CI of offspring

Parents are replaced by offspring at the end of the generation