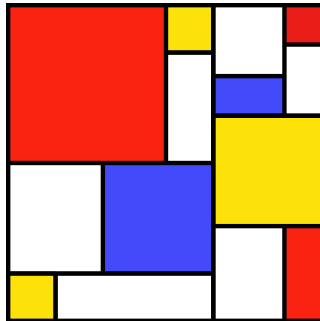


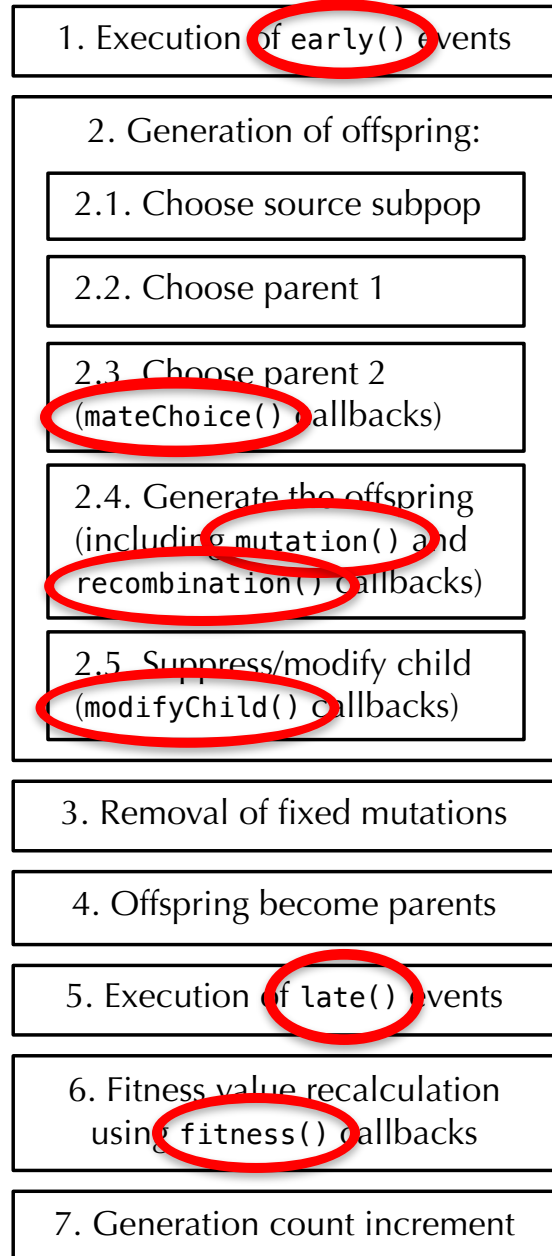
# SLiM

## Workshop Series



#12: Callbacks III (`modifyChild()`)

*The sequence of events within one generation in WF models.*



# The WF Generation Cycle

- Callbacks:
  - early() events
  - mateChoice() callbacks
  - mutation() callbacks
  - recombination() callbacks
  - modifyChild() callbacks
  - late() events
  - fitness() callbacks
  - interaction(), reproduction()

*The sequence of events within one generation in WF models.*

# modifyChild() callbacks

- called in offspring generation
- override default generation
- modify generated offspring
- often used to implement:
  - lethal mutations / epistasis
  - spatial dispersal / boundaries
  - gene drive mechanics
  - self-incompatibility
  - non-genetic inheritance

1. Execution of early() events

2. Generation of offspring:

2.1. Choose source subpop

2.2. Choose parent 1

2.3. Choose parent 2  
(mateChoice() callbacks)

2.4. Generate the offspring  
(including mutation() and  
recombination() callbacks)

2.5. Suppress/modify child  
(modifyChild() callbacks)

3. Removal of fixed mutations

4. Offspring become parents

5. Execution of late() events

6. Fitness value recalculation  
using fitness() callbacks

7. Generation count increment

The sequence of events within one generation in WF models.

# modifyChild() callbacks

```
modifyChild( [<subpopID>] )  
{  
    ...  
}
```

- apply to *one or all* subpops
- called for each **focal offspring**
- provided with gamete genomes
- return value:
  - **T** (proceed with generation)
  - **F** (terminate generation, draw new parents)

1. Execution of early() events

2. Generation of offspring:

2.1. Choose source subpop

2.2. Choose parent 1

2.3. Choose parent 2  
(mateChoice() callbacks)

2.4. Generate the offspring  
(including mutation() and  
recombination() callbacks)

2.5. Suppress/modify child  
(**modifyChild() callbacks**)

3. Removal of fixed mutations

4. Offspring become parents

5. Execution of late() events

6. Fitness value recalculation  
using fitness() callbacks

7. Generation count increment

The sequence of events within one generation in WF models.

# modifyChild() callbacks

- there is a *focal offspring*
- **pseudo-parameters:**
  - child, childGenome[1|2]
  - childIsFemale
  - parent1, parent1Genome[1|2]
  - parent2, parent2Genome[1|2]
  - isCloning
  - isSelfing
  - subpop
  - sourceSubpop

1. Execution of early() events

2. Generation of offspring:

2.1. Choose source subpop

2.2. Choose parent 1

2.3. Choose parent 2  
(mateChoice() callbacks)

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(including mutation() and  
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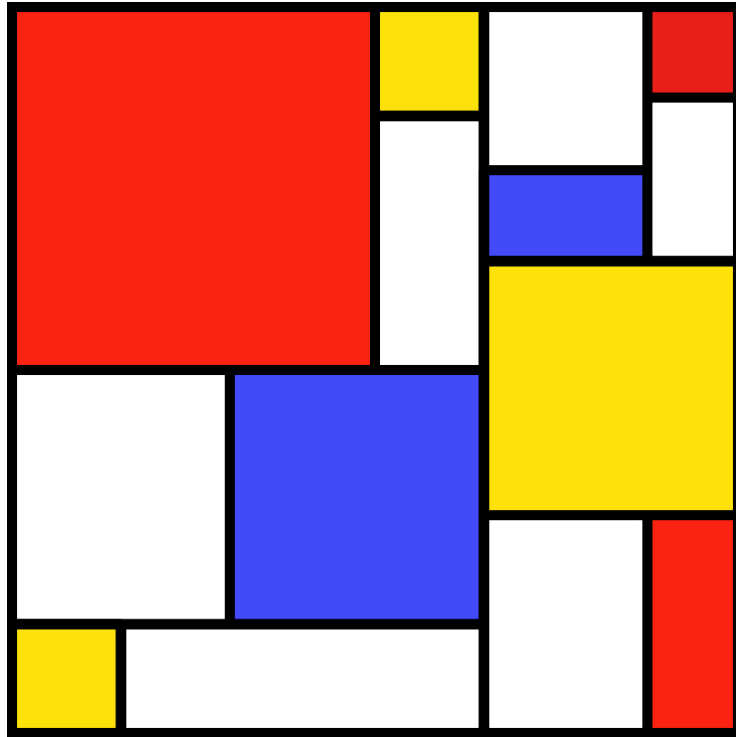
3. Removal of fixed mutations

4. Offspring become parents

5. Execution of late() events

6. Fitness value recalculation  
using fitness() callbacks

7. Generation count increment



SLiM Workshop Exercise #12