Motivation

- Epistasis gives rise to rugged fitness landscapes
- Surpassing local peaks requires crossing valleys of low fitness
- Theory has thus far been limited to the simple, symmetrical, Mendelian genetic case
- We extend the theory to allow for transmission bias, capturing phenomena such as:
  - Segregation distortion (e.g., meiotic drive)
  - Epistasis and selection in cultural traits

Model

Q. How long will it take to cross the valley, if ever?

Results

Crossing time, from new mutations

Crossing probability, from standing variation

Conclusions

- Drift, mutation, and recombination speed crossing, but it generally remains unlikely
- Meanwhile, transmission bias can greatly increase the probability of crossing