

Individual-level causes and population-level consequences of variation in fitness in an Alpine rodent

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**University of
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- Lukas Keller
- Barbara Tschirren
- Arpat Ozgul
- Marc Kéry
- Jarrod Hadfield



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- Eelke Jongejans
- Pirmin Nietlisbach
- Philipp Becker
- Judith Bachmann





Phenotypic variation within population



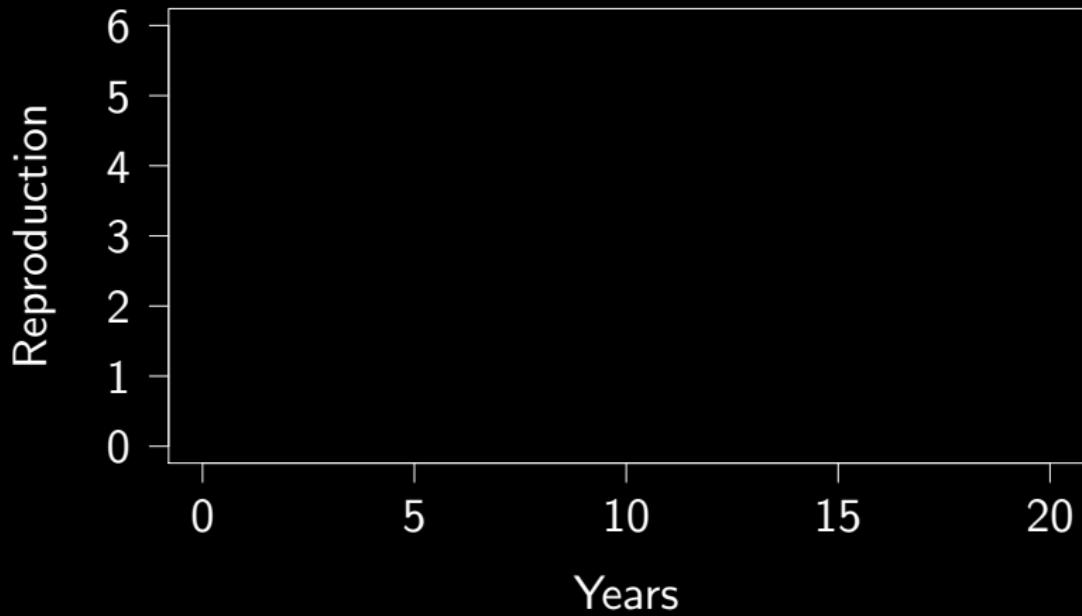
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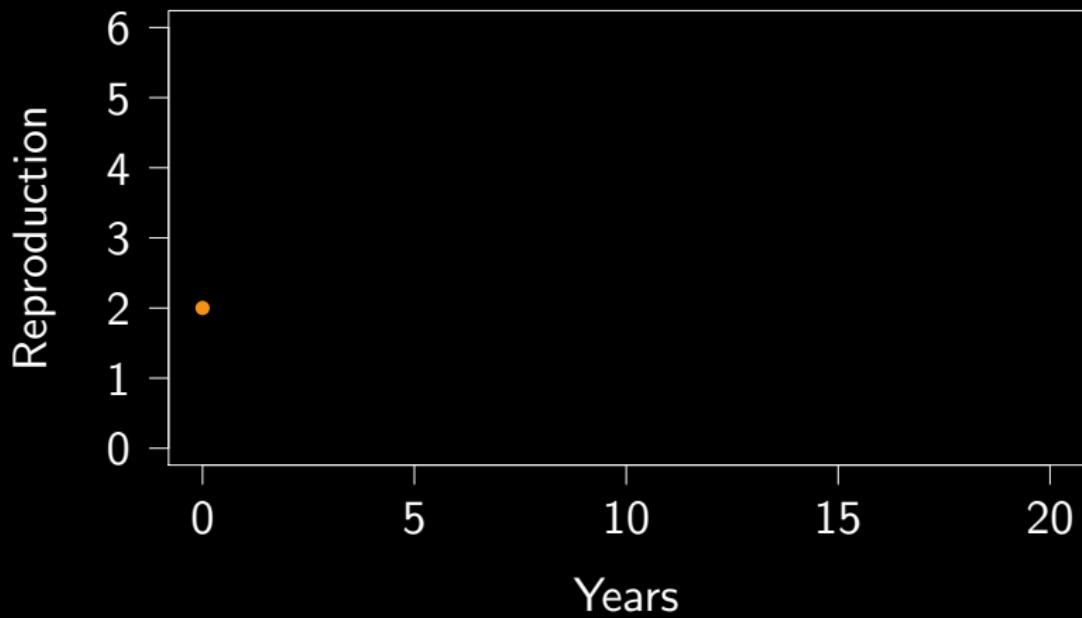


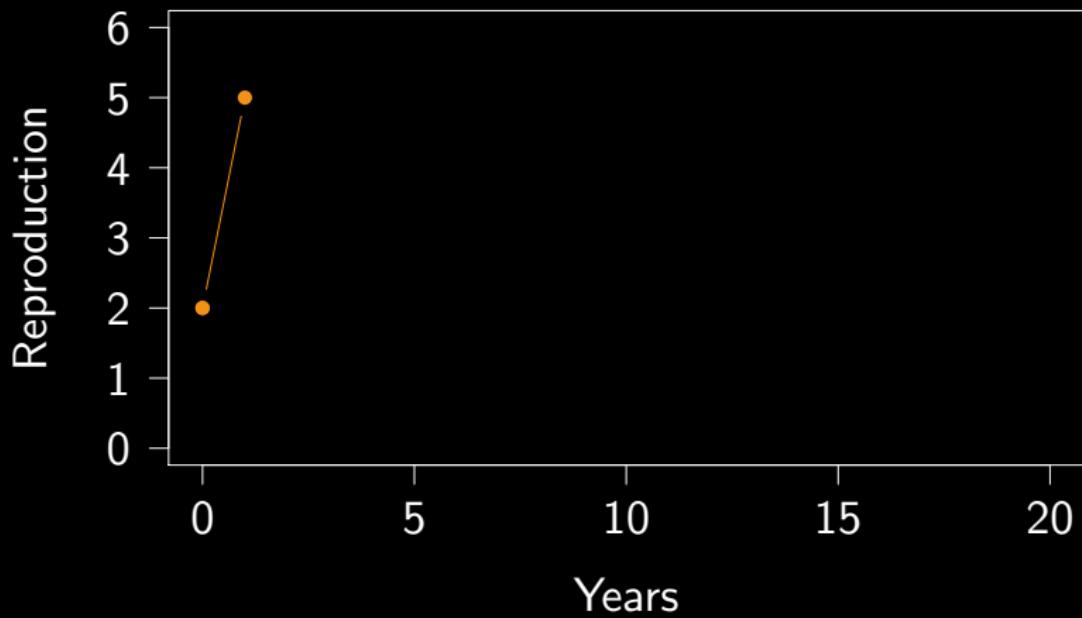
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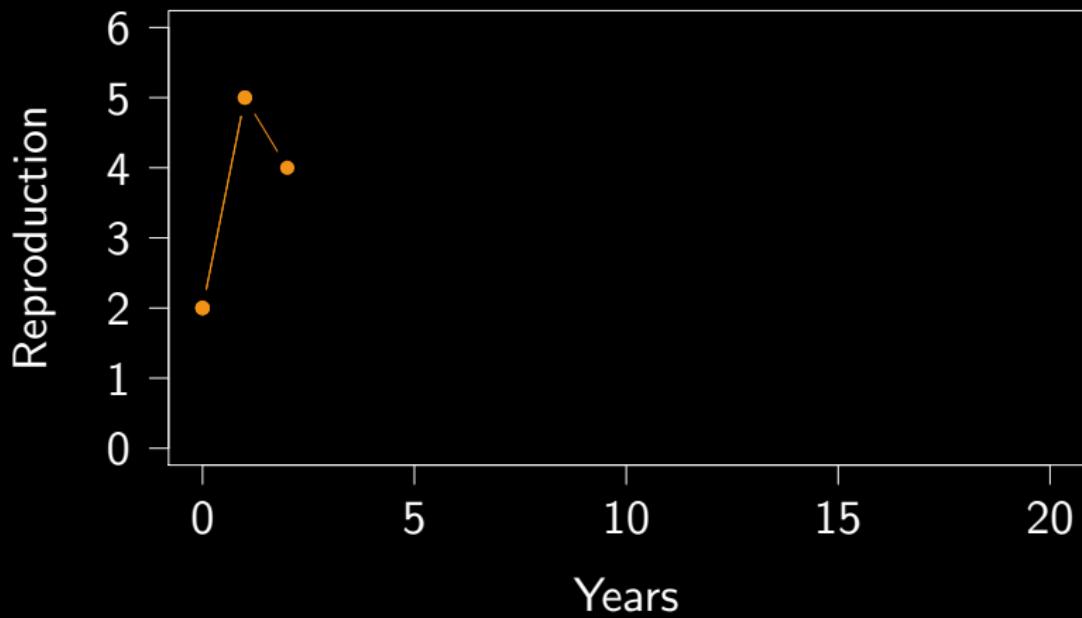


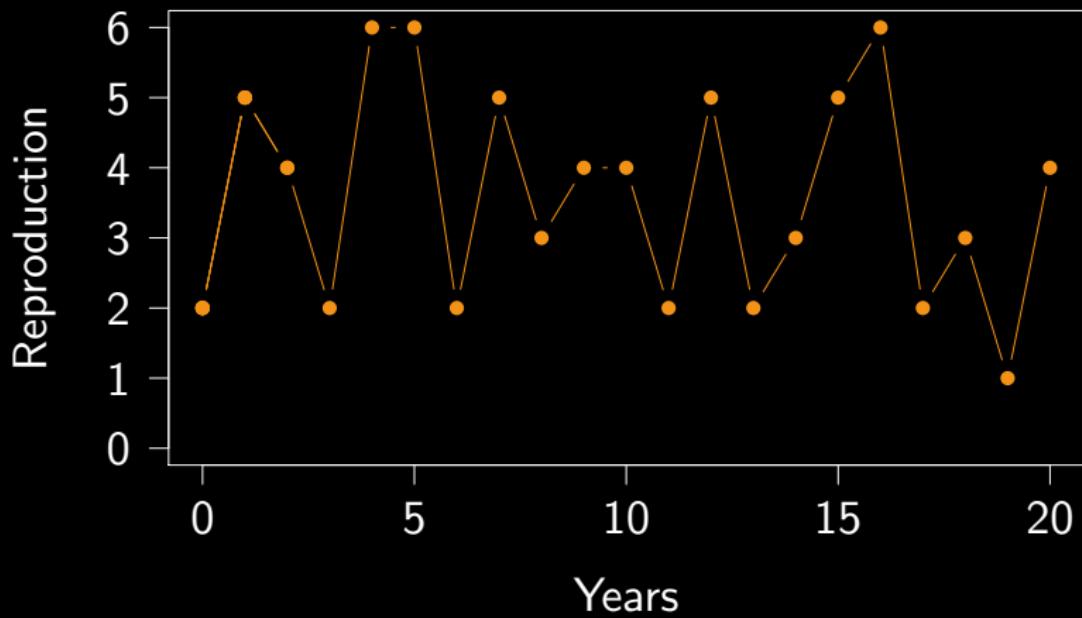
**Chance or fate? Why does
fitness vary?**

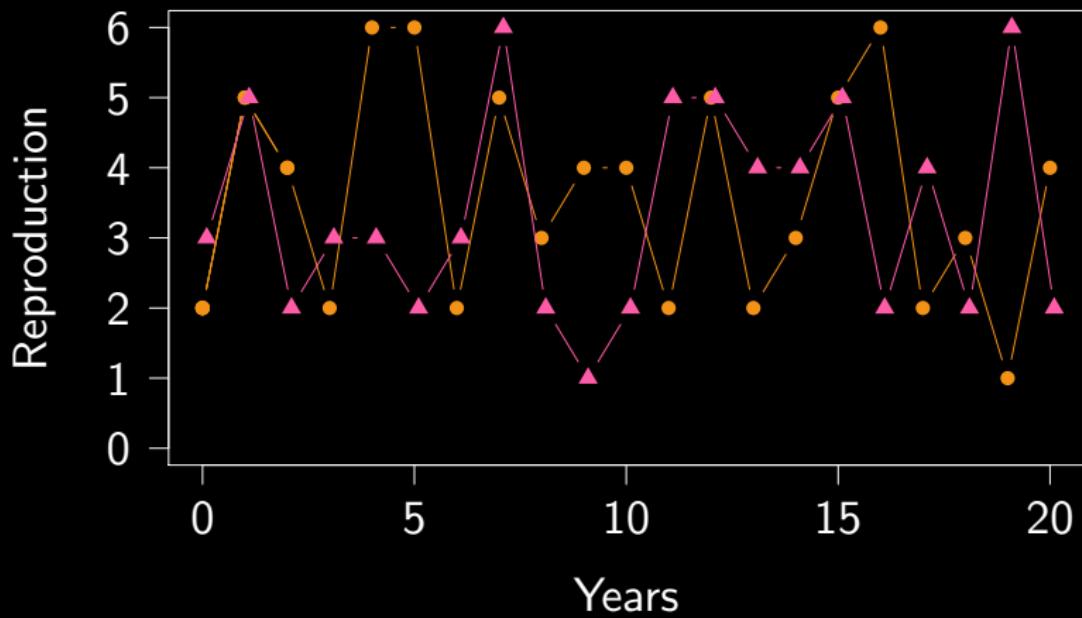


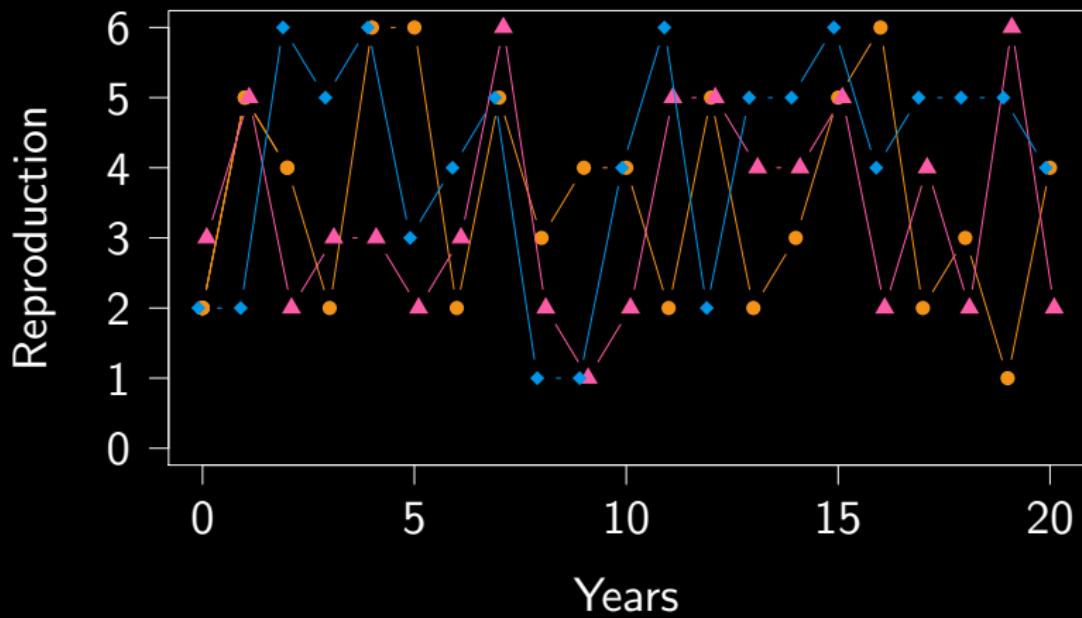




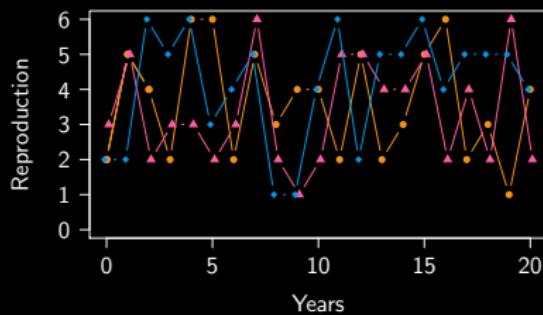




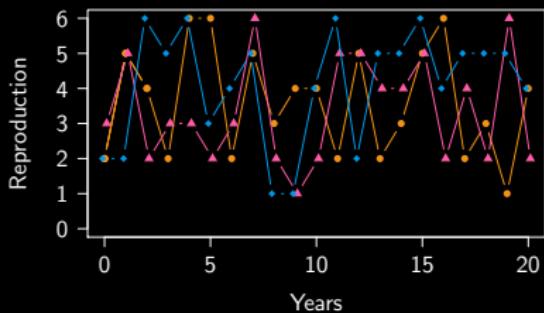




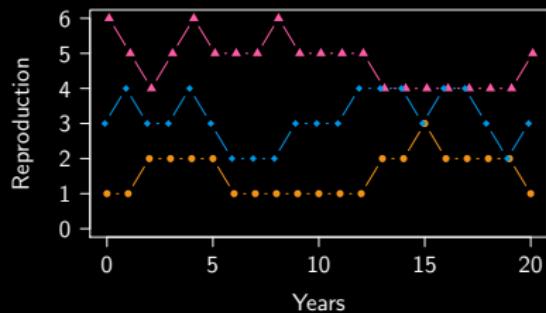
One dice theory



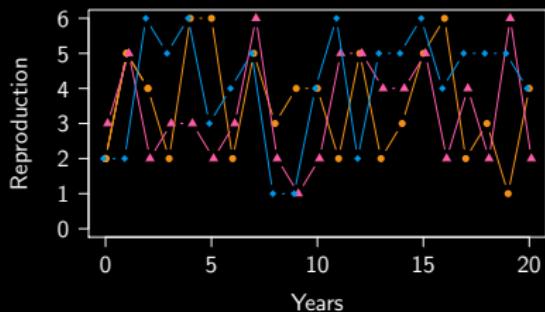
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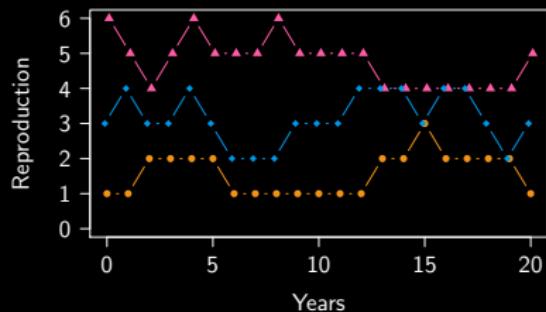
Real pattern



One dice theory



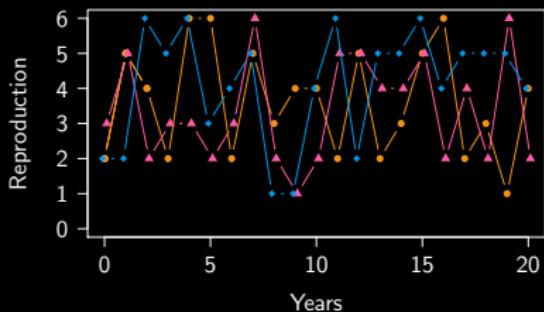
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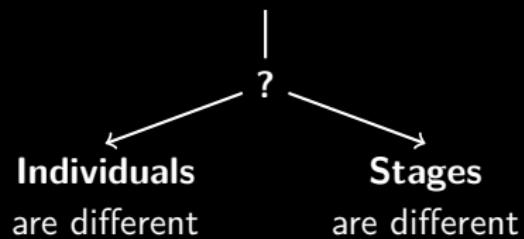
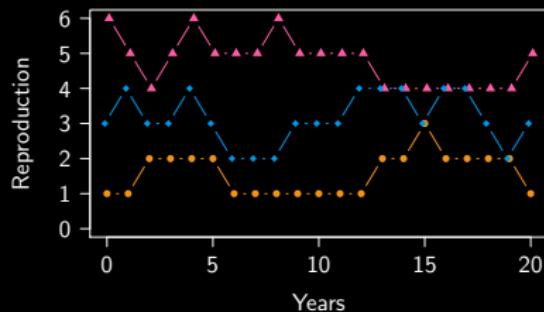
Individuals
are different

?

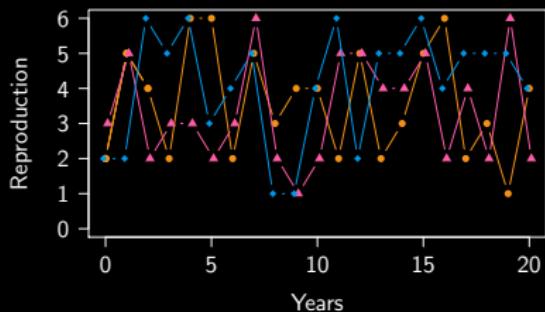
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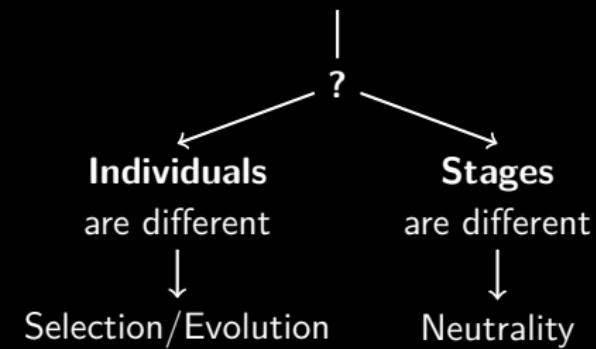
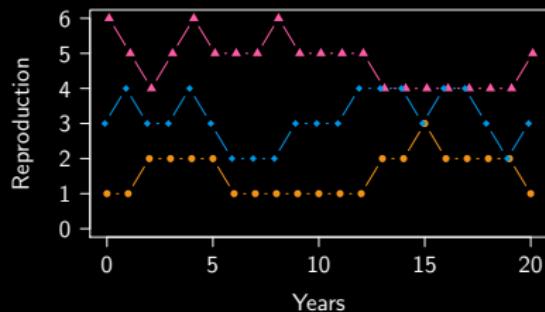
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Real pattern



Neutral theory for life histories and individual variability in fitness components

Ulrich Karl Steiner^{a,b,1} and Shripad Tuljapurkar^a

^aDepartment of Biology, Stanford University, Stanford, CA 94305; and ^bInstitut National de la Santé et de la Recherche Médicale U1001, Université Paris Descartes, 75014 Paris, France

Edited* by Burton H. Singer, University of Florida, Gainesville, FL, and approved February 3, 2012 (received for review December 3, 2010)

Individuals within populations can differ substantially in their life spans and their lifetime reproductive success, but such realized in-

yes and that this stochastic variation has significant implications for both ecological and evolutionary studies.

Neutral matrix method

		next year		
		1	2	3
1	0.9	0.08	0.02	
	2	0	0.7	0.3
3	0	0.2	0.8	

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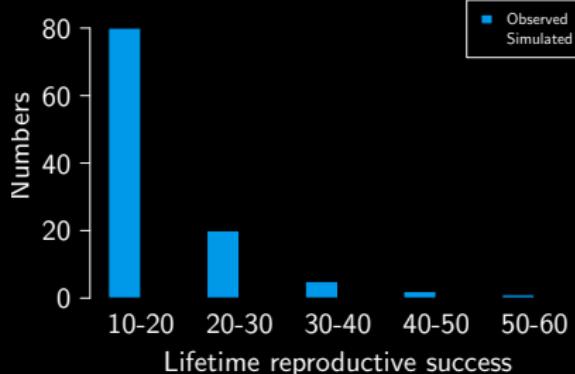
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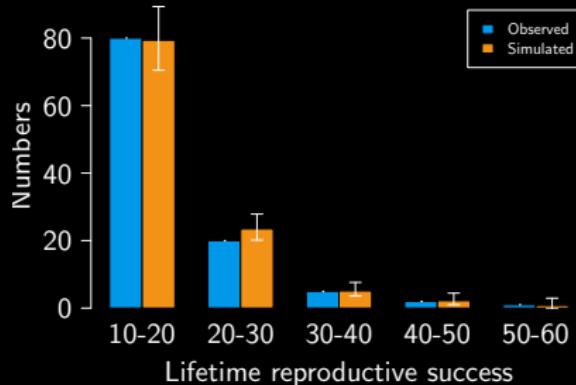
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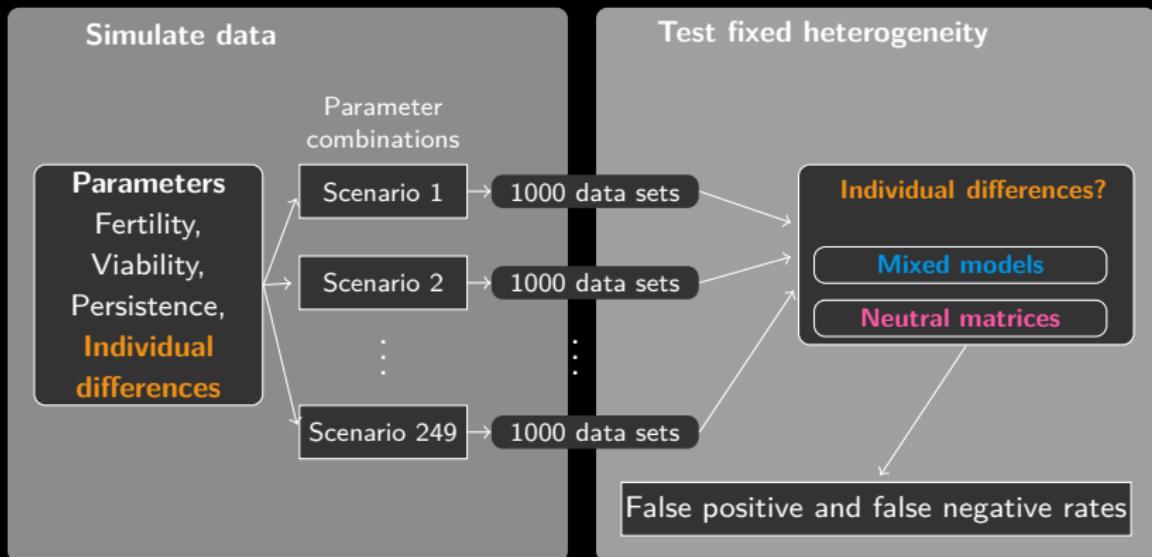
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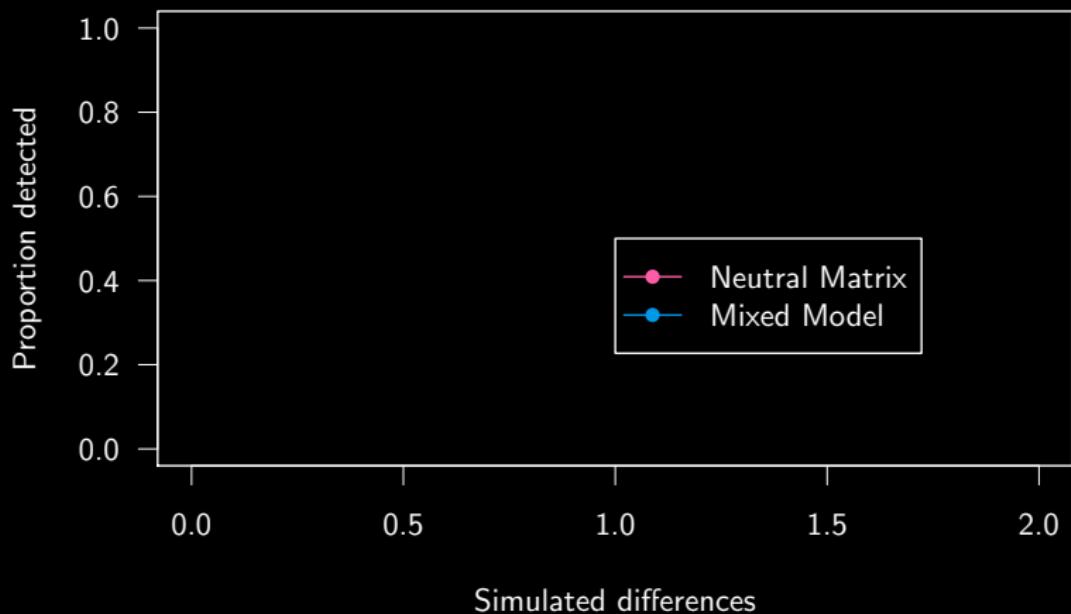
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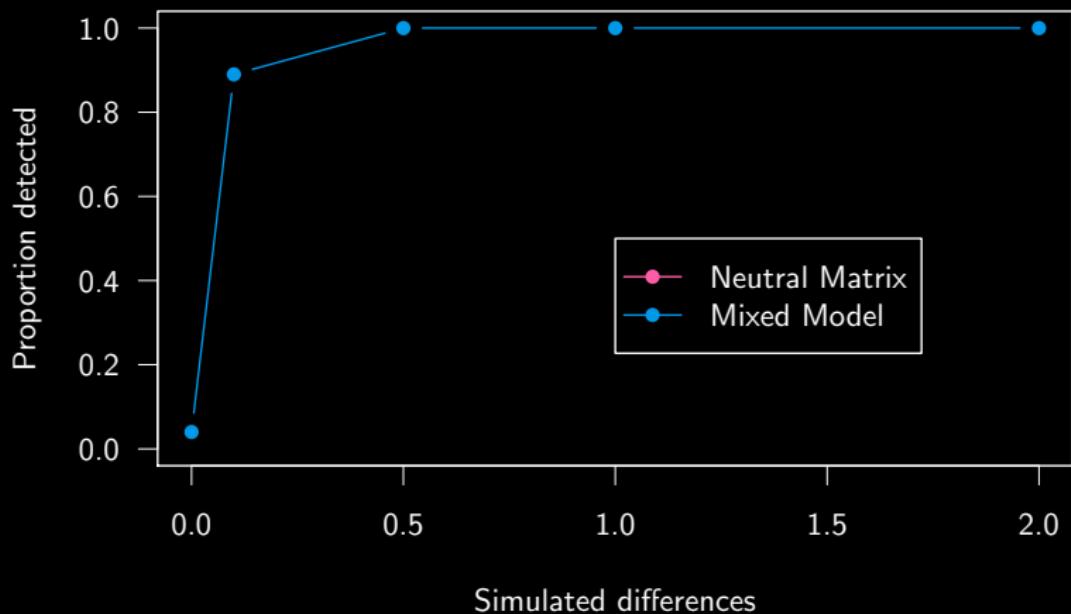
Method



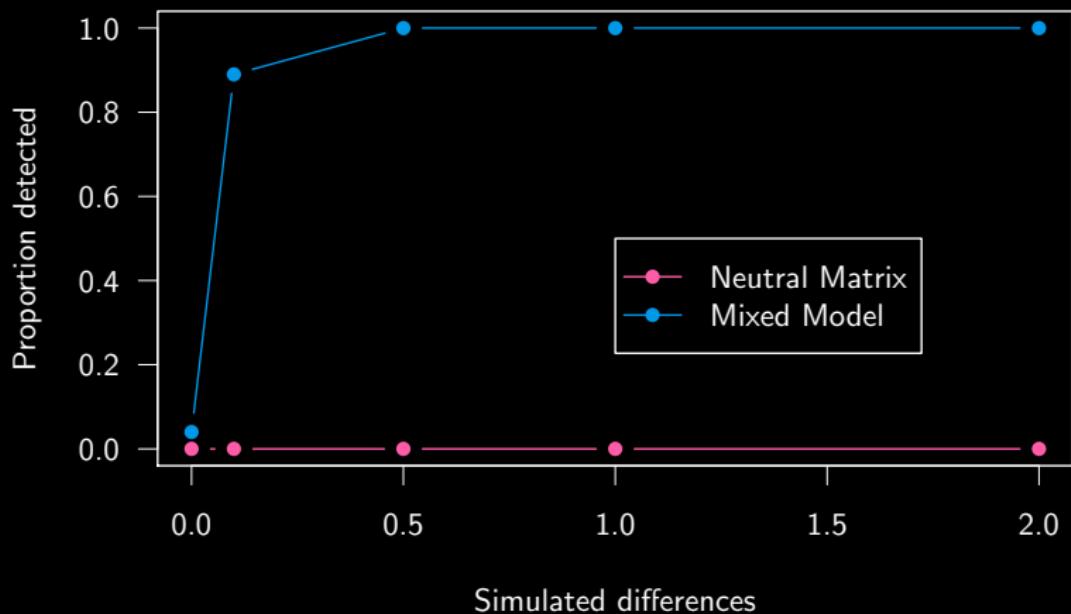
Results



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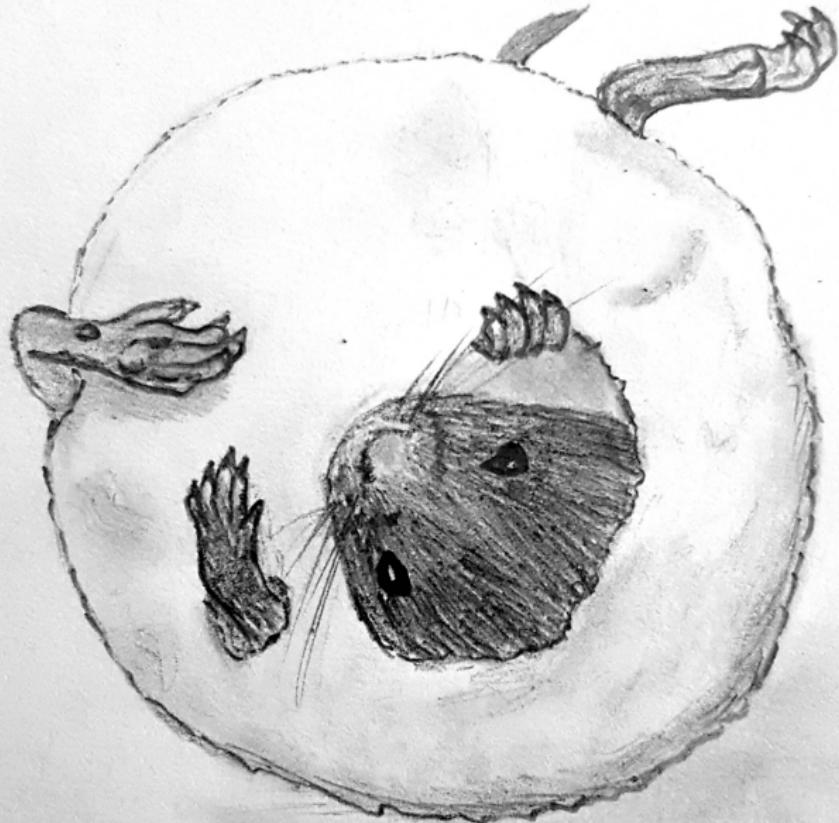


Conclusion

Implications

-

What drives phenotypic change?



Snow vole (*Chionomys nivalis*, Martins 1842)

- NOT white



Snow vole (*Chionomys nivalis*, Martins 1842)

- NOT white
- Rock-dweller



Snow vole (*Chionomys nivalis*, Martins 1842)

- NOT white
- Rock-dweller
- 30-45g



Snow vole (*Chionomys nivalis*, Martins 1842)

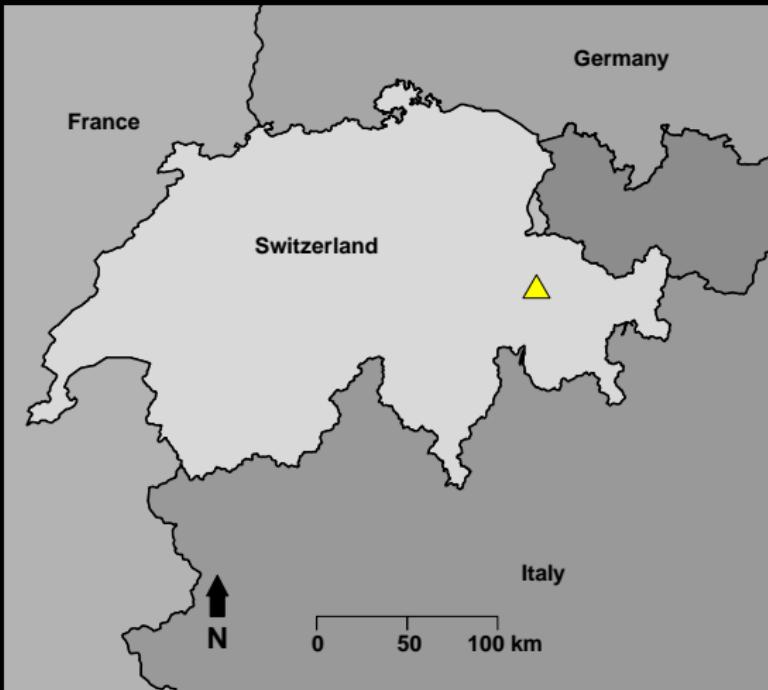
- NOT white
- Rock-dweller
- 30-45g
- 10-14cm long + 5-8cm tail



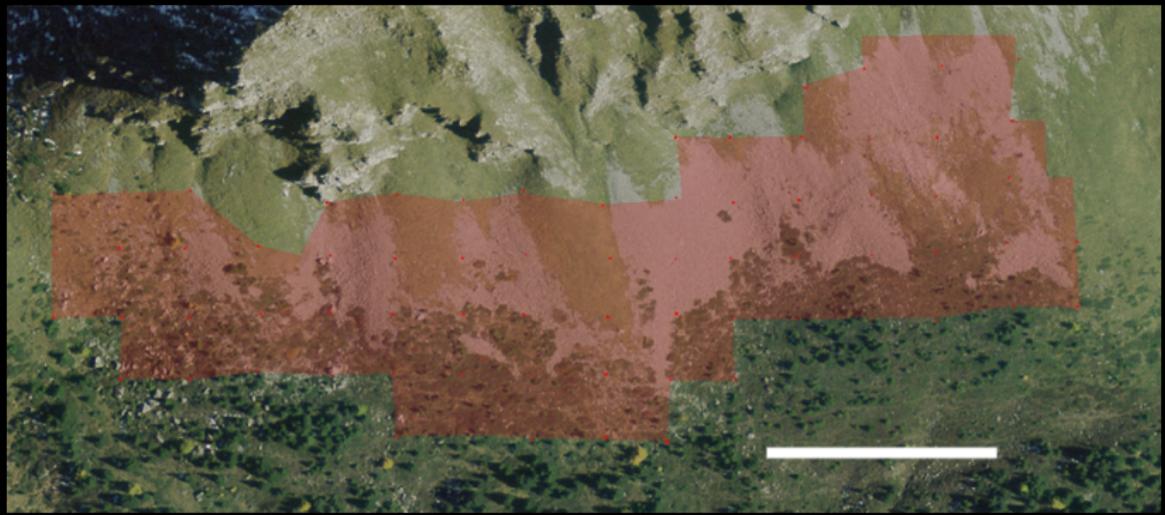
Snow vole (*Chionomys nivalis*, Martins 1842)

- NOT white
- Rock-dweller
- 30-45g
- 10-14cm long + 5-8cm tail
- Slow life pace













What we measure

What we measure

- Morphology
 - Body mass
 - Body length
 - Tail length



What we measure

- Morphology
 - Body mass
 - Body length
 - Tail length
- Capture/Recaptures
 - Death/emigration
 - Location



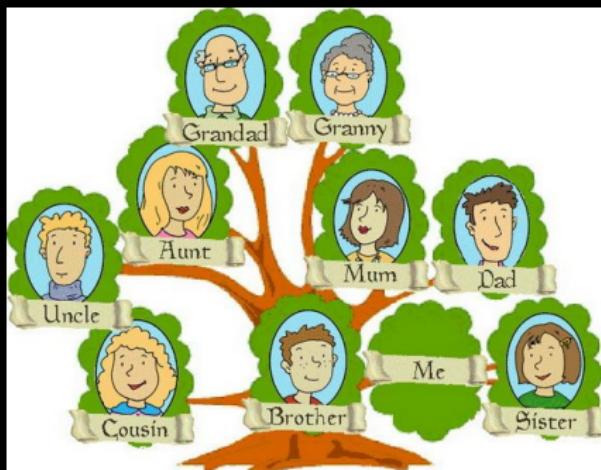
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- DNA
 - 20 “neutral” markers
 - Sex identification
 - Any genotyping



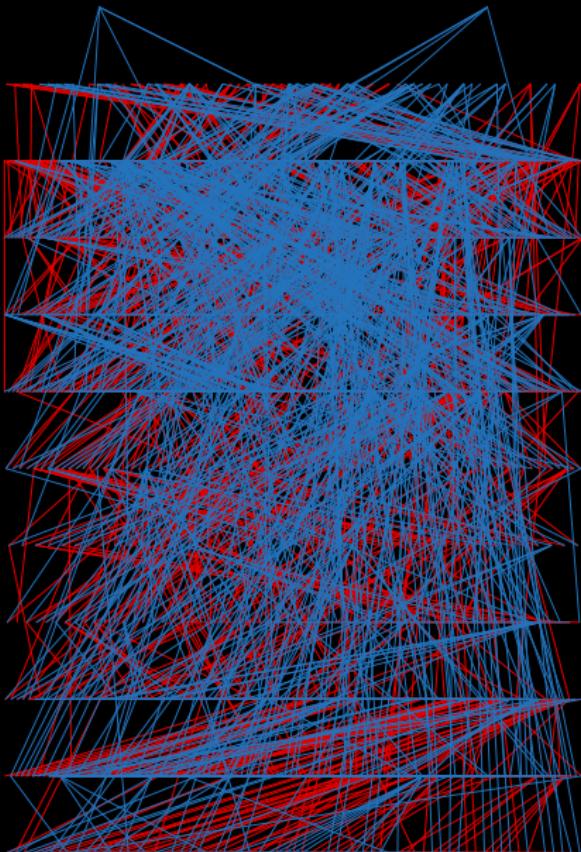
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Are snow vole evolving? Why?

**Do selection and evolution
fluctuate?**

What is left?
