Quantifying the evolutionary dynamics of language
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Rules in languages

- Simplify language production

- Enable "infinite" array of comprehensible formulations

- They wax and wane over millennia

Rules on English verbs

1. **Regular**, "-ed"

2. **Irregular**
   - Old rules, "sing, sang, sung"

   - No rules, "go, went"

Rules dynamics

- "for every 'sneak' that 'snuck' in, there are many more 'flews' that 'flied' out"

- Only 3% of verbs are irregular

- The most common verbs are irregular (*be, have, come, do, find...*)

Evolutionary theory: Uncommon irregular verbs are easy to forget and hard to learn

Data

Vast period spanning the Norman invasion, the invention of the printing press, and modern times. Regularisation path of sample verbs:

$$177 \xrightarrow{\text{Old to middle}} 145 \xrightarrow{\text{Middle to modern}} 98. \qquad (1)$$