18-month-olds' representations of vowels in regular & irregular verbs:
A mispronunciation study

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Breaking News:

Nouns and Verbs are different

Nouns

ball ~ balls ~ base**ball**

- Concrete
- Exists over time
- Generally consistent shape
- Lemma represented by same sounds across forms (plurals, compounds, etc.)

(Gentner, 1982; Gleitman 1990)

Verbs

- Relatively more abstract
- Some telic
- Fewer consistent visual features
- Often undergo morpho-phonetic changes in English (e.g. tense, aspect)

Throw ~ thr**e**w ~ **throw**s ~ **throw**n

(Gentner, 1982; Gleitman 1990)

In related news:

Verbs are more difficult to learn than nouns

Learning Verbs vs. Nouns

- Children produce significantly fewer verbs than nouns, even at 30mo. (Braginsky et al., 2017)
- Verbs are acquired later cross-linguistically (Frank et al., 2018)
- Frequency is not the reason verbs are learned later:
  - English-learning children hear verbs more frequently than nouns (Goodman et al., 2008)

Last shocking headline:

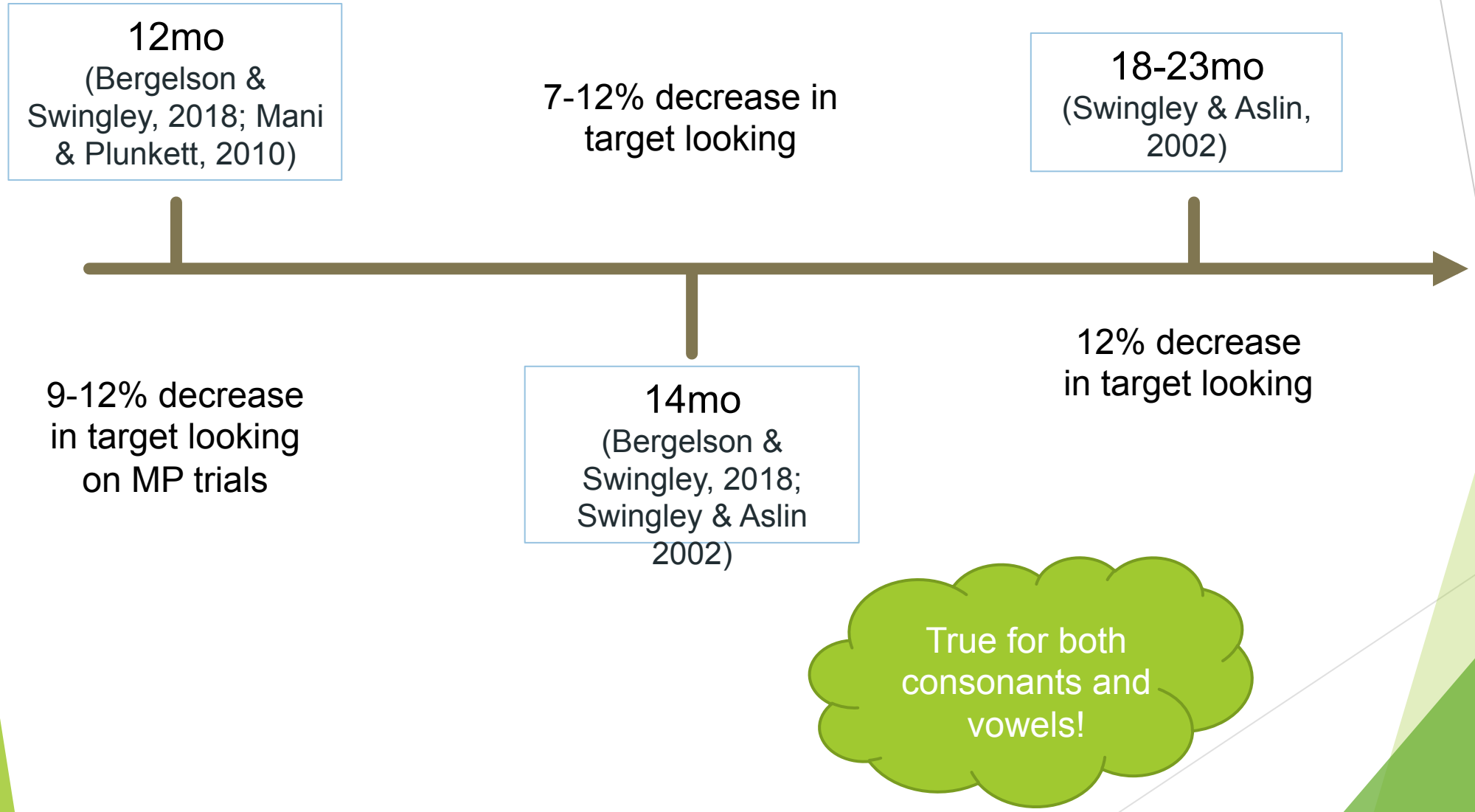
Infants have well-specified representations of how nouns *sound*

Quantifying Phonetic Representations

Mispronunciation (MP) effect – How much more do infants look at the referent of a spoken word when it's correctly vs. incorrectly pronounced?

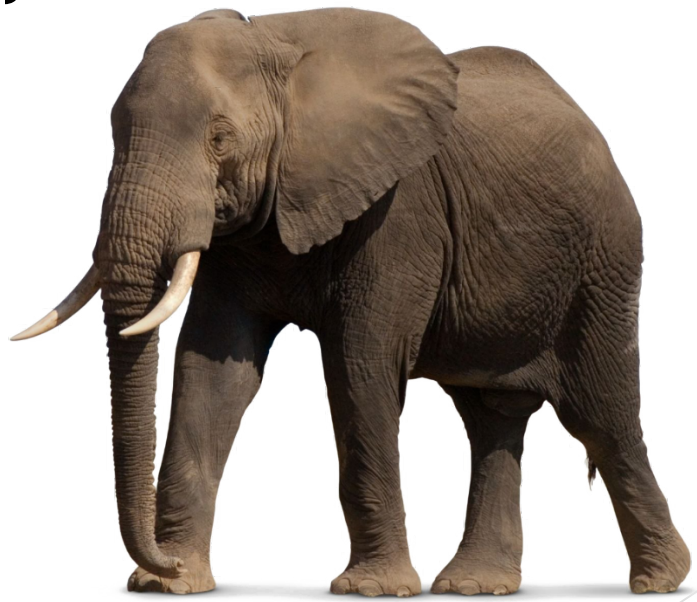
apple > *opple* = MP effect

By 12mo, noun MPs are a big deal

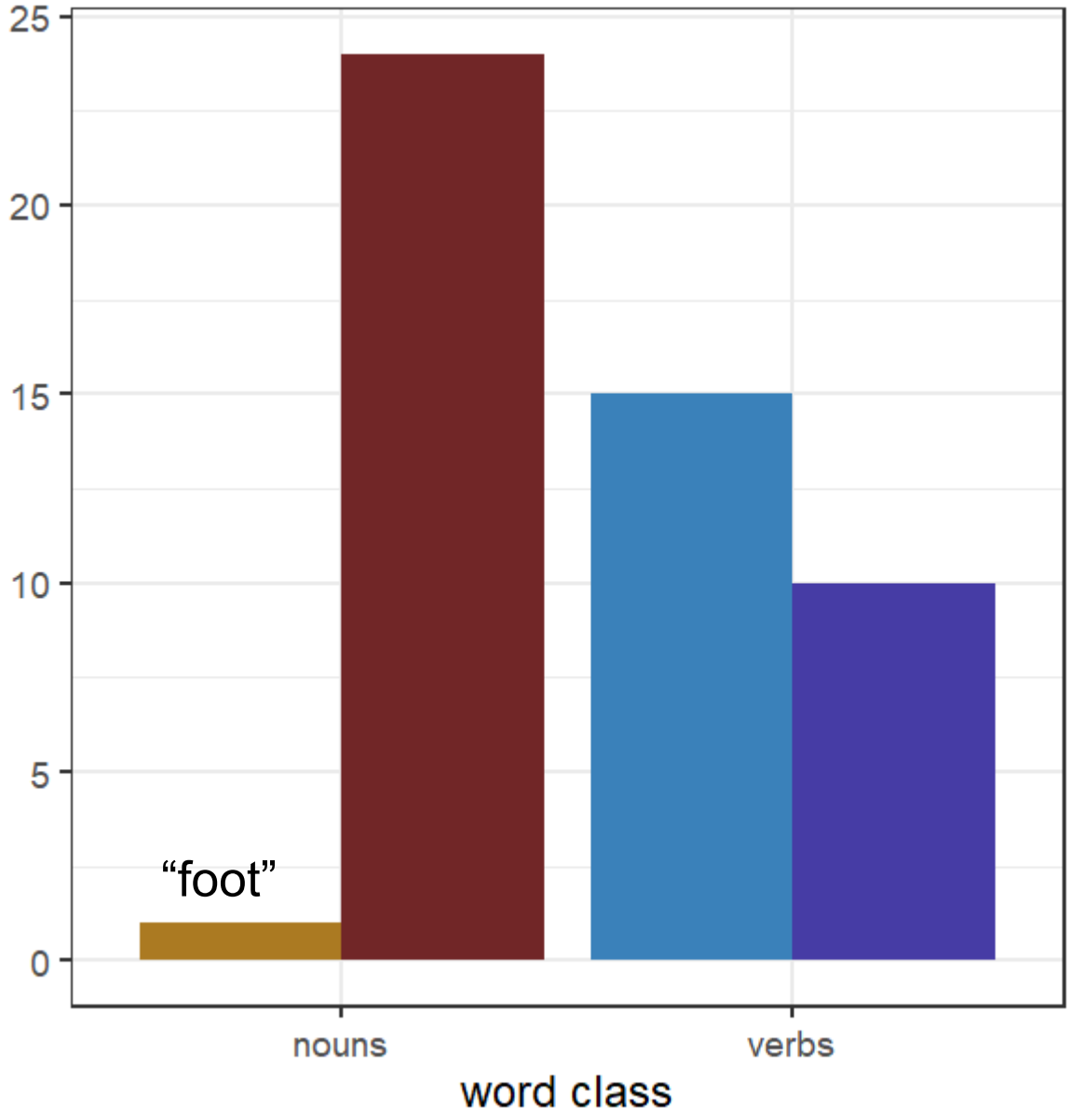


Open Question:

- Given robust noun MP effects…
- How do infants represent the sounds of verbs?
  - Elephant in the room: Regularity
  - Irregular verbs change vowels



Regularity in Common Nouns and Verbs



Of the top 25 noun & verb *types* infants hear:

- Only 1 noun is irregular
- 15 verbs are irregular

Over Verb Tokens:

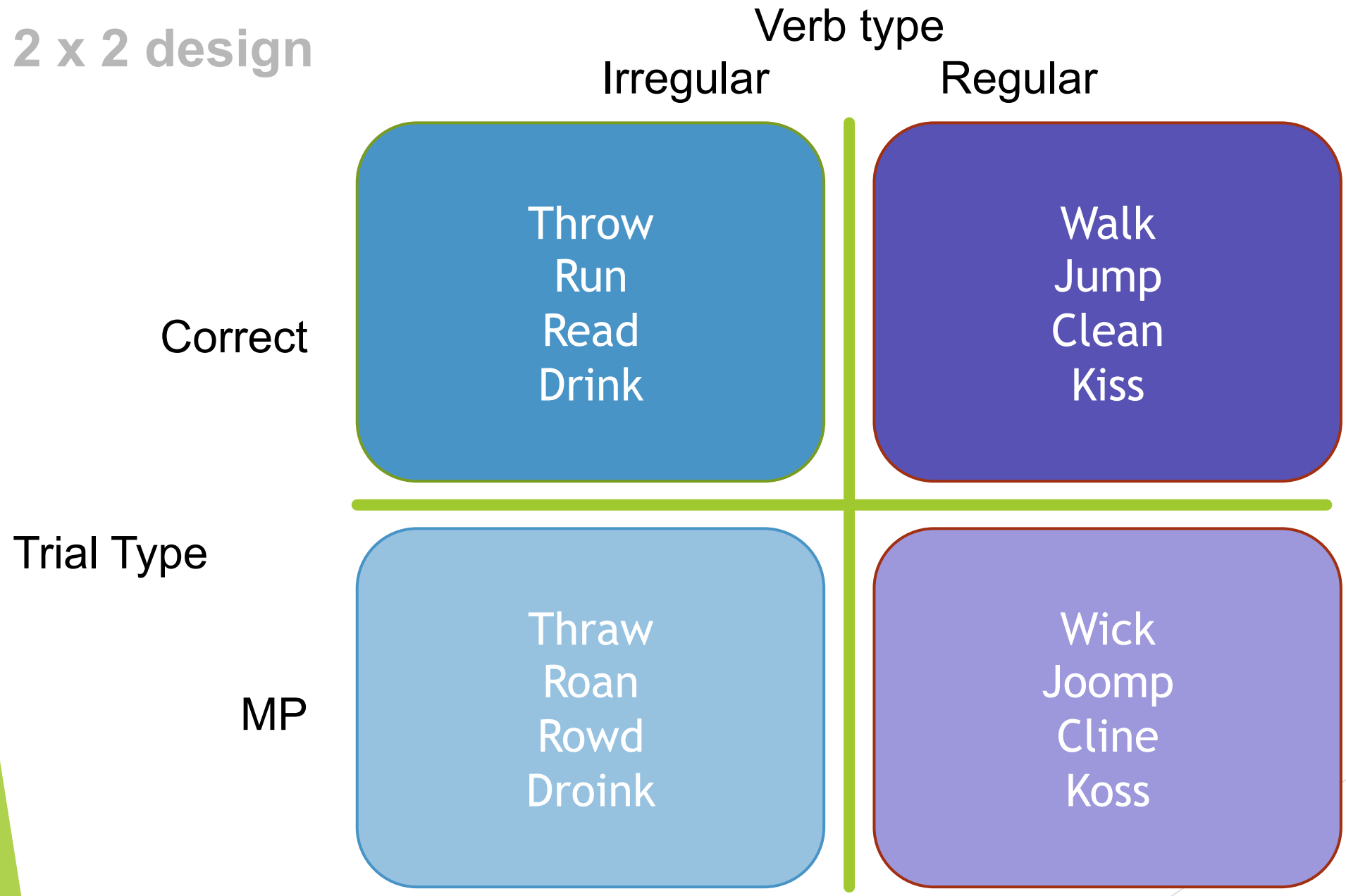
- Irregular forms occur 20% of the time.
- "Walk": 100% same vowel
- "Throw": 80% *throw*, 20% *threw*

The current study

Do toddlers detect MPs in common verbs?

Does verb *regularity* play a role?

2 x 2 design



N= 32
Trials,
8 verbs

Study Design

Look, she can clean!
Look, she can cline!
Look, she can read!
Look, she can rowd!

Items

Pair	Target	MP (IPA)	Carrier Phrase	18mo understand (WordBank)
1	Throw	Thraw /θɹɑ/	She's gonna _____	89%
	Walk	Wick /wlk/	She's gonna _____	80%
2	Run	Roan /ro:n/	Look! She can _____	73%
	Jump	Joomp /ʤump/	Look! She can _____	63%
3	Read	Rowd /raʊd/	Look! She can _____	79%
	Clean	Cline /klaɪn/	Look! She can _____	64%
4	Drink	Droink /dɹoiŋk/	She's about to ____ it	93%
	Kiss	Koss /kɑs/	She's about to ____ it	98%

- ☐ Regular
- ☐ Irregular

Participants

32 16-20mo USA English learners

We tested 18mo because:

- Test items understood by >60% of 18mo (Frank et al., 2017)
- Robust MP effect for nouns (e.g. Swingley & Aslin, 2000)

By parent report on CDI-WG, infants knew on average:

- 168 words
- 27 verbs

Predictions

Hypothesis 1: Verbs' vowels are unpredictable

Prediction: No MP effect with either verb type

Hypothesis 2: Irregular verbs' vowels are unpredictable

Prediction: No MP effect with irregular verbs, But MP effect with regulars

Hypothesis 3: Accurate representations, despite vowel variability in irregular verbs

Prediction: MP effect with both verb types