The NDR_a: A single route model of reading aloud

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Existing models

- State-of-the-art models of reading aloud are dual-route models
- Lexical route:
  - orthography to phonology mapping is mediated by lexical representations
  - responsible for reading known words
- Sub-lexical route:
  - direct mapping from orthography to phonology
  - responsible for reading unknown words and non-words

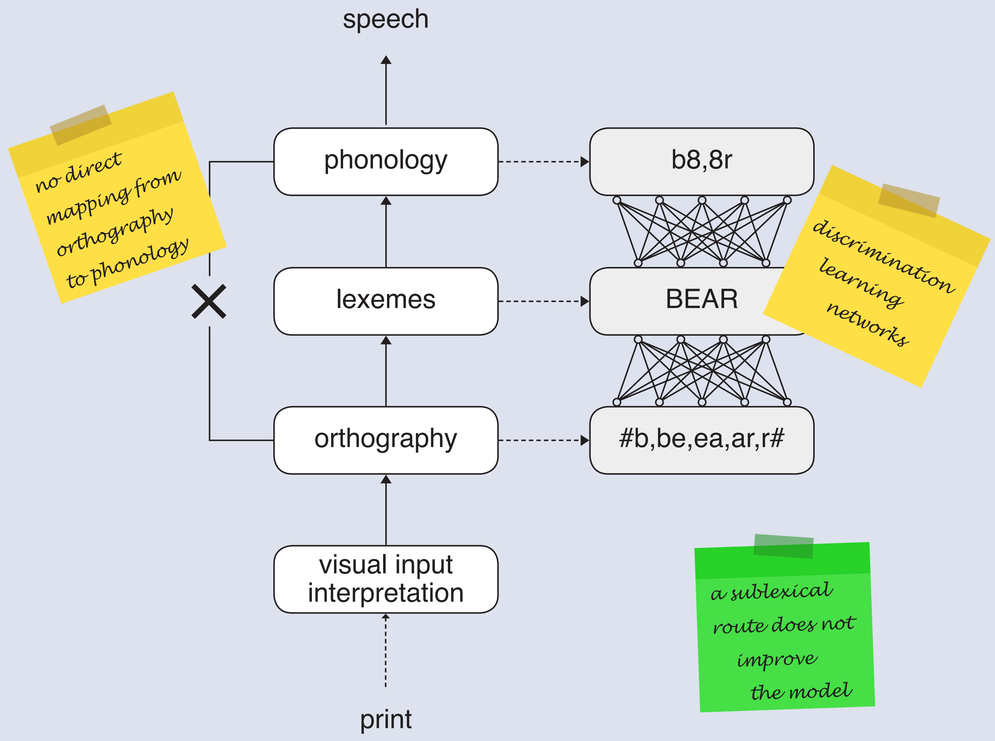
NDR_a

- A single lexical route is responsible for both word and non-word naming
- Non-words are read through the activation of lexical representations of orthographically similar words
- The computational core of the model is based on a general-purpose discrimination learning algorithm (Rescorla & Wagner, 2010)

Simulation study

- How similar are the simulated naming latencies generated by the NDR_a to observed naming latencies?
- Do the simulated naming latencies for words show the same predictor effects as observed naming latencies?
- Do the simulated naming latencies for non-words show the non-word effects documented in the literature?

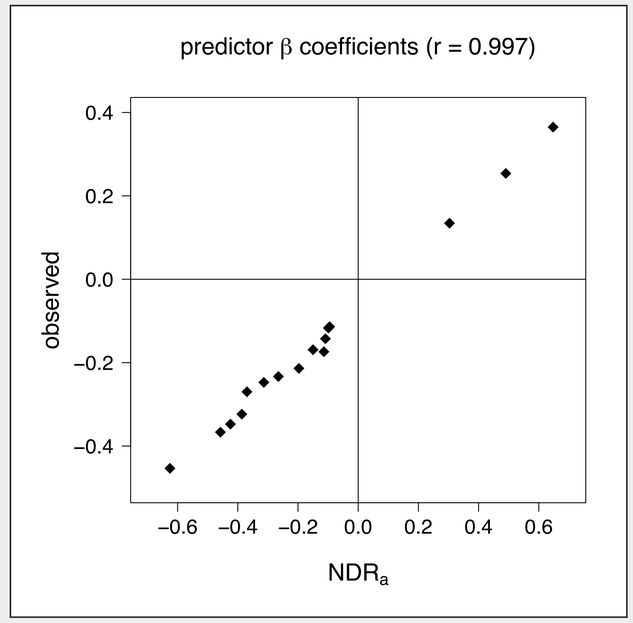
Naive Discriminative Reading Aloud (NDR_a)



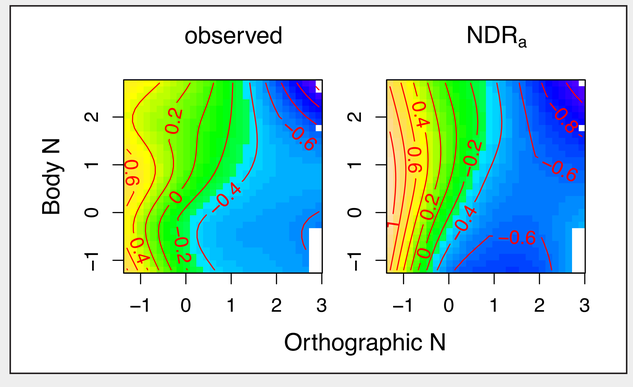
Results

- Correlation between observed and simulated naming latencies: **r = 0.500**
- Word naming: the NDR_a captures the effects of a wide range of predictors on observed naming latencies, including the effects of frequency, length, regularity, consistency, and neighborhood density measures
- Non-word naming: the NDR_a correctly predicts a non-word naming disadvantage, a pseudohomophone advantage and effects of length and neighborhood density measures
- The NDR_a correctly predicts a **non-word frequency effect**

Predictor effect sizes



Neighborhood density effects



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