Modelling Diachronic Semantics of Demonstrative Pronouns

Background: Demonstrative pronouns (*this, that*) making exophoric reference appear in every language (Diessel, 1999), and are involved in myriad grammaticalization clines (Greenberg, 1978; Diessel, 1999). In their transition from deictic exophoric pronouns to functional items there are midway points. We have found little attention paid as to why the distal is commonly grammaticalized over the proximal.

Data collected through original experimentation motivates diachronic shifts through synchronic grammaticality judgments. We propose a new definition of the demonstrative pronoun with a relatively more marked proximal demonstrative.

$$[[this]] = \lambda P.\iota x P_{w0}(x) \wedge at_{w0}(x)(l_n) \wedge speaker\ pointing\ at_{w0}(l_n) \wedge close_{w0}(l_n)$$

$$[[that]] = \lambda P.\iota x P_{w0}(x) \wedge at_{w0}(x)(l_n) \wedge speaker\ pointing\ at_{w0}(l_n)$$

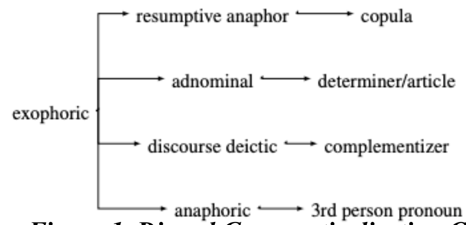

Figure 1. Diessel Grammaticalization Cline

Evolutionary Model: This new definition makes accessible language modelling techniques for language change. The Evolutionary Game Theory model was first implemented for semantic in the progressive-imperfective aspectual shift in the verbal domain (Deo, 2015). Speakers employ strategies as a function from states to lexical forms and hearers employ strategies as functions from lexical forms to states. Through various utility functions with value of communication disambiguation, economy, and probability of strategy adoption, we model population adoption of mutually beneficial strategies. The prevailing strategy involves use of the distal in contexts involving physically distal and proximal referents.

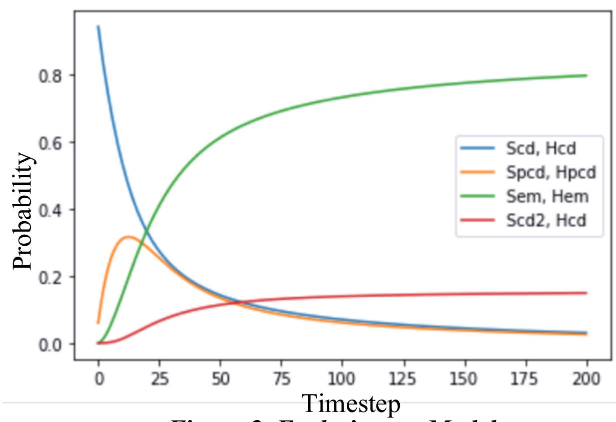

Figure 2. Evolutionary Model

Weighted Finite State Transducer: To best model language evolution we used a weighted finite state transducer (Pereira and Riley, 1997). The model transduces states and is constructed by composing a model representing the probability of a state *p(S),* word model representing the probability of a word in the speaker's reference state *p(S | W),* and a weighting of production based on the Replicator Mutator Dynamic (Deo, 2015). The composed model is a joint probability of $p(S, W) = p(S)p(W|S)$ where $p(W|S)$ relies upon the fitness of W and population likelihood of replication. We use Viterbi decoding to compute the best path through an automaton to find the *S.*

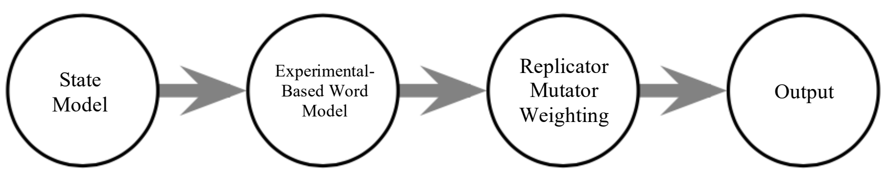

Figure 3. Cascading Models

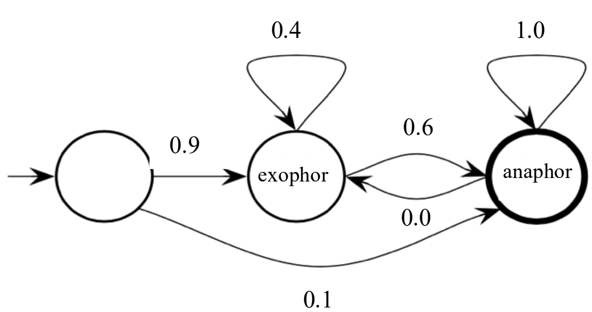

Figure 4. State Model

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