Introduction: I compare simulations modeling nominal class changes from Latin to Romance. The simulations take into account token frequency and sound changes. Without token frequency, the model better reflects the history of Romance, while the sound changes reveal what mergers could have come about purely via sound change. These results corroborate literature stating that token frequency *weakens* analogical models and provide insight into precursors existent in Latin that caused an overhaul of the nominal system in modern Romance languages.

Background: Modern Romance has vastly simplified the Latin nominal system (5 declensions, 3 genders, 6 cases). While most Romance languages have completely lost nominal case (collapsing to the accusative), two other minority systems exist (Ledgeway 2011): (1) Gallo-/Rhaeto-Romance: NOMinative VS OBLique. (2) Daco-Romance: NOMinative/ACCusative VS GENitive/DATive. These systems descend from an earlier ternary NOM/ACC/OBL system; however, there is dispute over whether the ABLative first merged with ACC (Clackson & Horrocks 2007) or with GEN/DAT (Banniard 1992).

Model: Connectionist models have long been used to model diachronic class change (Hare & Elman 1995, Polinsky & Van Everbroeck (2003)). This simulation tests how closely a model taking into account *only* phonology and frequency can replicate history. The input to the model is a bit vector representing the declension, gender, case, and number of each noun (n=500). For training, each token is introduced a number of times proportional to its case/number combination (=type) frequency, and (in half the simulations) its token frequency in Latin. The model imperfectly predicts the phonological form of the suffix using a classification algorithm. The results are fed as the new expected outputs for the following generation, compounding "errors" over time and thus simulating language change, over 10 generations. 50 trials were run for each model, with each trial representing a hypothetical descendant of Latin. The results were analyzed with and without sound changes that affect the nominal endings: (1) final m $>$ $\varnothing$. (2) short high V (i, u) $>$ mid V (e, o). (3) V: $>$ V.

Results: Figure 1 reveals that the majority of trials merge GEN and DAT regardless of sound change. However, Figure 2 demonstrates that there is a much higher chance of NOM, ACC, and ABL merging once sound changes are implemented. Figure 3 shows that leaving out token frequency leads to greater accuracy in the results. The results support (1) the view that type, and not token, frequency predicts directionality in analogical change (Baayen & Lieber 1991), (2) an early merger of GEN and DAT (likely driven by similarity in the relatively frequent SG forms), and (3) a merger of ACC, and ABL (and subsequently with NOM) (rather than ABL with GEN/DAT) following sound changes–in particular, the loss of final *m* and vowel length distinction led to formal similarity between the highly frequent ACC.SG and ABL.SG.

References

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Figure 1: Similarity of GEN and DAT (Before VS After Sound Change)

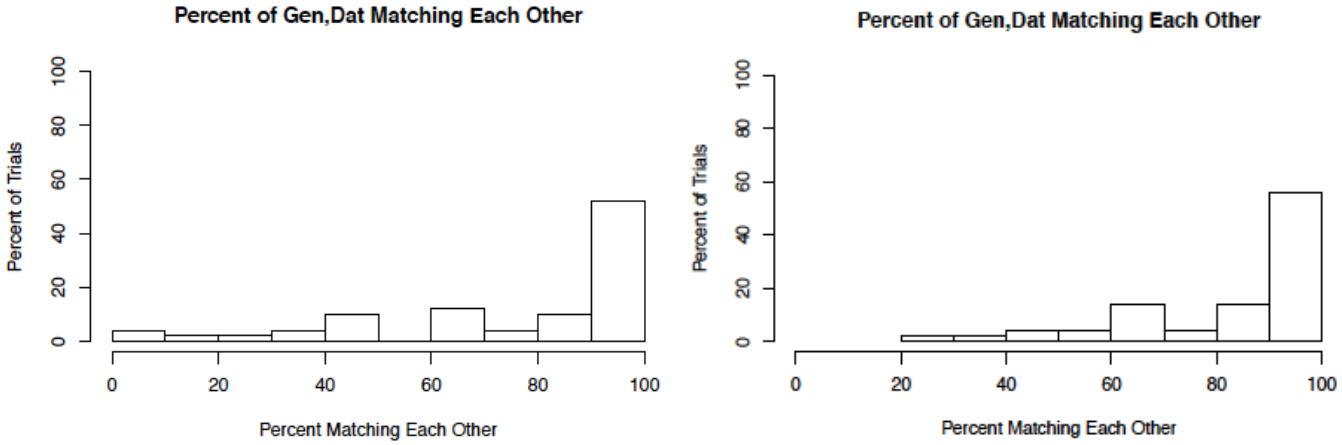

Figure 2: Similarity of NOM, ACC, ABL (Before VS After Sound Change)

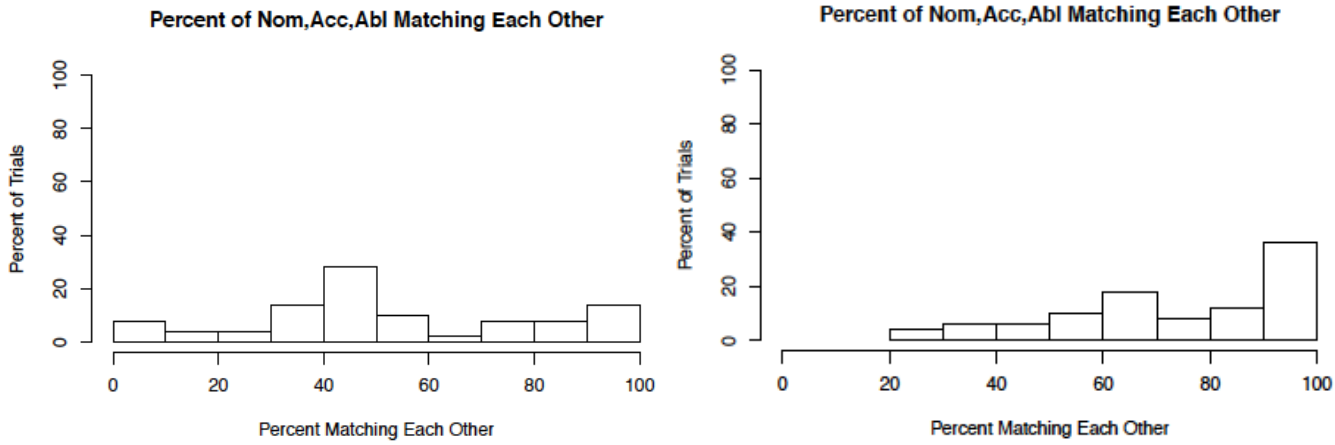

Figure 3: Similarity of NOM, ACC, ABL after Sound Change (Token Frequency On VS Off)