Quantifying Factors Shaping the Morphological Integration of Non-Semitic Nouns in Maltese

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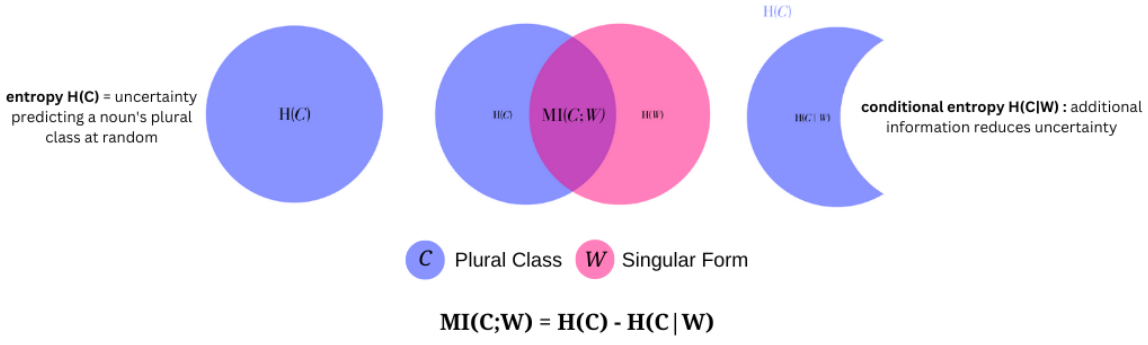
This project investigates the extent to which the phonology, semantics, and etymology of nouns predict Maltese nominal plural inflection at two levels of inflectional organization: inflection type (affixal or templatic) and inflectional allomorph (specific suffixes and CV templates). We analyze lexical and morphological integration as an extension of the Paradigm Cell Filling Problem (PCFP) in theoretical morphology (Ackerman et al., 2009) using the information theoretic methods developed by Williams et al. (2020). We interpret our results within the context of Matras's (2009) description of a unified multilingual repertoire and Haugen's (1950) characterization of borrowing as the outcome of analogical processes used by speakers in multilingual discourse.

We use Normalized Mutual Information (NMI) to quantify the extent to which phonological and semantic similarities across the lexicon are predictive of nominal plural inflection in data (Nieder et al., 2021a,b) compiled from the Korpus Malti v. 2.0 and 3.0 (Gatt and Čéplö, 2013). Under the hypothesis that associative relationships among frequently co-occurring material may promote historical continuity in inflectional behavior, we also quantify the NMI shared by a noun's etymology and plural class as a measure of the predictive strength of conservative forces, for example token frequency (Krause-Lerche, 2022), hypothesized to resist analogical classification and change.

Our current results indicate system-level phonology and etymology are each independently predictive of Maltese plural inflection class structure, with phonology more predictive than etymology overall. Implicative relationships are also found to be stronger across inflection classes defined at the allomorph level, regardless of concatenative type. We find an effect of type frequency, with larger inflection classes predicted more often than smaller classes, but no evidence for the predictive coherence of macro-classes defined with respect to concatenative type (i.e., broken/sound plurals). These findings support a unified account of the development of Maltese morphology, in contrast with "hybrid" accounts.



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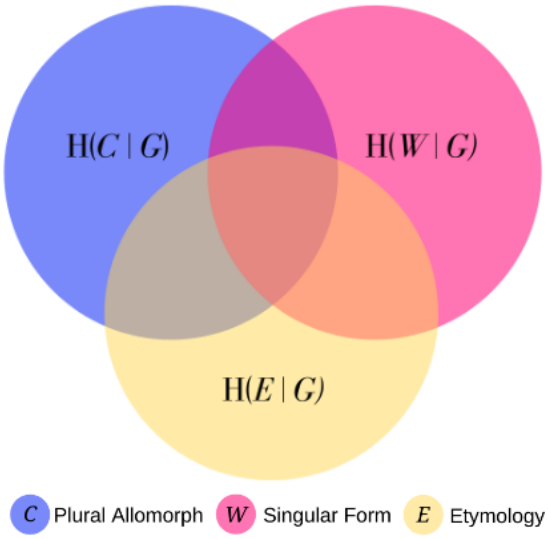
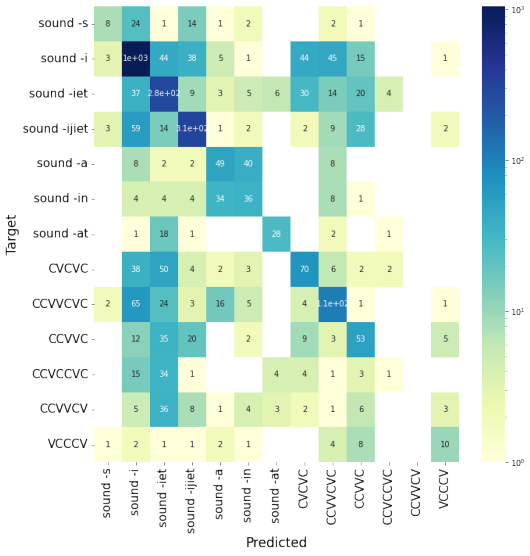


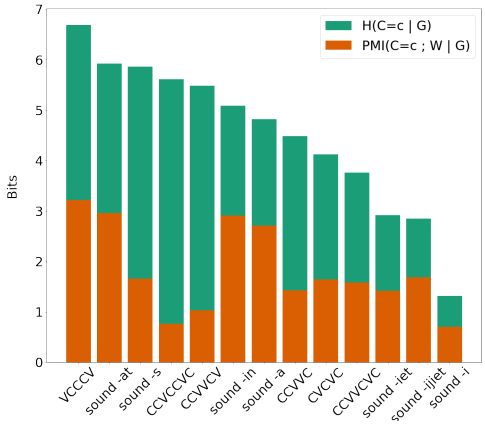
		TYPE	ALLOMORPH
H(C|G)		0.81	2.65
NMI(C;W|G)		0.21	0.42
NMI(C;E|G)		0.13	0.22
NMI(C;E;W|G)		0.06	0.15
NMI(E;W|G)		0.61	0.61

↑ H = ↑ uncertainty; ↑ NMI = ↑ inter-predictability

Figure 1: Normalized Mutual Information (NMI)



(a) Confusion matrix: predicting plural allomorph from phonological form



(b) Partial Pointwise Mutual Information (PMI) shared by word form and class for each allomorph class. Note that classes are presented in order of increasing type frequency (and thus decreasing surprisal)