Distributional configuration of morphs results in fusional and agglutinative patterns

Adriana Fasanella. Universitat Autònoma de Barcelona. afasanella@gmail.com

The aim of this study is to argue that the distributional configuration of morphs, jointly with a learning constraint independently motivated for acquisition on how the learner builds morphological paradigms, are responsibles for the appearance of fusional and agglutinative patterns diachronically.

Given the representation of morphological knowledge in paradigms and their acquisition as put forward in Pinker (1984), the following constraint, active during the process of language acquisition, operating as a simplifying complexity device (Chomsky 2005, Roberts 2007), is proposed:

Minimise Paradigms Constraint (MPC). The learner hypothesises just one general paradigm when affixes in cells show a systematic syntagmatic relationship.

A more informal way of reformulating the MPC is stating that the learner prefers to hypothesise the fewest possible paradigms when affixes show a concrete pattern detected by the Language Acquisition Device, that of being in a *systematic syntagmatic relationship*. Two morphs show that configuration when they always appear adjacently, one cannot appear without the other and no other material can appear in between. In Pinker's original model, this distributional configuration between morphs on cells is not taken into consideration (although it is recognised that the learner must keep track of these relationships in order to avoid some potential errors). Therefore, according to Pinker's original proposal, if the learner encounters a specific paradigm (with the stem, X, included) like the one in (a), he builds, after extracting the phonetic material in common, the following two agglutinative general paradigms (b), (c). However, once we introduced the modification in Pinker's model in order to capture the effects of the MPC, when the learner encounters two morphs that show a systematic syntagmatic relationship through a paradigm like the one in (a), he builds just one general paradigm, that is, he takes all affixal information in cells and let it the same as a general paradigm (d).[1]

(a)	(b)	(c)	(d)
Xab	b	a	ab
Xac	c		ac
Xad	d		ad
Xae	e		ae
Xaf	f		af

We argue that, due to the effects of the MPC, two relevant predictions about the degree of fusion (Sapir 1921) in verbal morphology can be made. *Prediction 1* states that when some morphs show a systematic syntagmatic relationship in a paradigm and consequently the learner builds just one general paradigm for all the affixes, these affixes will (eventually) show a fusional pattern in subsequent intances of the language. The logic behind prediction 1 is that, once affixes are put together in the same paradigm, they will begin to show inconsistencies among forms, suffer morphophonological erosion and finally fusionalisation, due to the systematic contiguity of pieces (all these cases will be exemplified). For that reason, where on a first stage there are two different affixes instantiating two morphemes, in subsequent stages of the language there will be just one fusionalised morph, though the semantic distinctions it encodes were mantained, given the successive analyses of learners. *Prediction 2* states that when two morphs do no show such a systematic relationship and consequently the learner builds as many general paradigms as needed, the affixes will show an agglutinative pattern in subsequent intances of the language. Prediction 2 captures the observation that potentially discontiguity between morphs block morphophonological erosion and favours agglutination.

The logic behind this proposal is that the learner's analysis during language acquisition can influence the I-language that he will end up acquiring. If learners' analyses of a given generation are consistent, their (modified

---

[1] If the learner encounters a paradigm containing morphs that do not show such a systematic syntagmatic relationship, Pinker's model applies as usual.

with respect to the previous one) language will serve as input to the following generation of learners, who will acquire an already modified language. The dynamics of this process of diachronic change motivated by acquisitional factors is also assumed, for instance, in Roberts (2007)' explanation of parametric change.

In order to illustrate the emergence of fusional patterns we will focus on Latin verbal paradigms and their Romance counterparts in Catalan, Spanish, Italian and French. We will argue that, because of some independent changes in the Latin passive voice system, two morphs, the Tense-Aspectual-Mood (TAM) marker and the personal desinence, became always adjacent in Latin and, as an effect of the MPC, verbal paradigms underwent an important fusionalisation, observable in different degrees of completion in Romance. We will pay attention to morphological paradigms of the present (IND and SUBJ), imperfect (IND and SUBJ) and perfect (IND) tenses in all conjugations in order to show the increasing difficulty in distinguishing TAM markers from personal desinences as two different units in Romance languages (whereas in Latin the TAM morph and the personal desinence are always perfectly distinguishable). Some relevant data is showed below, for Latin (e) and Italian (f) 1st conjugation paradigms:

(e)

Amo	Amem	Amabam	Amarem	Amavi
Amas	Ames	Amabas	Amares	Amavisti
Amat	Amet	Amabat	Amaret	Amavit
Amamus	Amemus	Amabamus	Amaremus	Amavimus
Amatis	Ametis	Amabatis	Amaretis	Amavistis
Amant	Ament	Amabant	Amarent	Amaverunt/ere

(f)

Amo	Ami	Amavo	Amassi	Amai
Ami	Ami	Amavi	Amassi	Amasti
Ama	Ami	Amava	Amasse	Amò
Amiamo	Amiamo	Amavamo	Amassimo	Amamo
Amate	Amiate	Amavate	Amaste	Amaste
Amano	Amino	Amavamo	Amassero	Amarono

Regarding agglutinative patterns, we will pay attention to the structure of verbal complexes in Bantu languages. We will argue that the agglutinative nature of Bantu morphs is due to the non-adjacency of mandatory elements, as it can be observed in the traditional schema of the full structure of the verbal pieces in Bantu languages, as in Meeussen (1967):

(g) (preinitial) initial (postinitial) (preradical) radical (prefinal) final (postfinal)

Given that distribution, the MPC cannot be used by the learner in these contexts and the agglutinative patterns are derived. We will concentrate on data in Chichewa from Mchombo (2001) and other Bantu languages. In the same line of argumentation, we will also discuss some Turkish data (Korn 1997).

This study argues that constraints active during language acquisition can (diachronically) shape the format of linguisitic structures. A constraint active during language acquisition affecting how the learner builds up morphological paradigm representations independetly motivated given computational reasons is proposed: the MPC. The effects of the MPC in the successive analises consistently made by learners can predict the degree of fusion in (verbal) morphology, that is, whether the relevant morphs will be fusional (as will be exemplified with Romance languages) or agglutinative (as will be exemplified with Chichewa and Turkish). This approach can be considered a step forward in predicting how morphological change happens inasmuch as it establishes specific morphological contexts where the learner's analises are going to change input representations. Also, as far as the author is aware, this is the first attempt in the literature to relate the use of distributional properties, which we do know are extensevely managed by language learners (Redington et al. 1998), with the discovery of concrete semantic aspects of morphs, namely, if they encode only one semantic distinction (agglutination) or more (fusionalisation).

Selected References. Chomsky (2005) Three Factors in Language Design. *Linguistic Inquiry*; **Korn** (1997) *Turkish*. Routledge; **Mchombo** (2001) Chichewa (Bantu). *The Handbook of Morphology*. Oxford University Press; **Meeussen** (1967) Bantu grammatical reconstructions. *Africana linguistica*; **Pinker** (1984) *Language Learnability and Language Development*. Harvard University Press; **Redington et al.** (1998) Distributional information: A powerful cue for acquiring syntactic categories. *Cognitive Science*; **Roberts** (2007) *Diachronic Syntax*. Oxford University Press; **Sapir** (1921) *Language*. Harcourt, Brace and World.