

Inflectional scarcity in pidgin/creole languages: what it tells us about their formation and morphological theory

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1. Introduction: inflectional scarcity as a diagnostic

Ever since Muysken's (1981) seminal volume, studies of pidgins and creoles (p/c's) in a generative framework have been directed essentially towards syntax and non-lexical semantics, in particular the distribution and meanings of tense-mood-aspect (TMA) markers.¹ This bias is obviously related to the preconception that p/c's have no or few inflectional processes, as well as limited derivation and shallow phonologies. True, the recent years have brought significant changes in this matter: see, e.g., the papers in Plag (2003) and Bhatt & Plag (2006), as well as Plag (2008), Crowley (2008), among others.

However, morphological studies of p/c's primarily aim to do away with the preconception by showing that p/c's present more, and more complex inflectional and derivational morphological processes than previously thought. The simplicity of their morphological apparatus, in the absolute as well as in comparison to their lexifiers (English included) remains unchallenged, however – probably because it is true to a large extent.²

P/c's' morphological simplicity (see footnote 2) is then taken as diagnostic of what the pidginization / creolization process leads to, in possible contrast with “ordinary” language change. Given this, it is often a backcloth assumption that complex morphological, especially inflectional processes are like wrinkles: they come with old age (McWhorter 1998, 2005). There does not seem to be any notion that p/c's' (relatively) smooth skin actually reveals something about their emergence and history, independently from their youth which may not be all that relevant after all, as well as about the status of morphology in the grammatical machinery. My main argument in this paper is that it does.

Why should we believe so? With respect to morphology, we should start, I think, with the banal observation that language-like symbolic systems, e.g., computer languages, do not include morphological phenomena, only natural languages do, showing e.g. different stems or roots for different tense values of the same verbal lexeme as in French *je venais* vs. *je viendrai* or English *go* vs. *went*. This seems an unneeded complication. Why don't natural languages make do with the three minimally required (“conceptually necessary”) components: lexicon, syntax, and compositional semantics?³ Actually, natural languages, including p/c's, never do.

This implies, I believe, that being so universally present morphological phenomena cannot be accidental, they have to serve some function, the non-fulfilment of which would at least make language less adequate than it is for being acquired and used by human beings. Which function? And what does it mean for languages to show more or less morphological phenomena?

I do not expect to be able to answer these questions in the present paper... or ever. I only wish to show that p/c's may be helpful to take a first and important step, namely

¹ The volume includes two excellent morphology-minded papers, though, authored by Jan Voorhoeve and Peter Mühlhäusler.

² I use “simple” in the unsophisticated sense of “descriptively simple”, meaning that describing Nubi morphology (see below) takes up less pages than does describing Sudanese Arabic morphology. From this fact, one often concludes that Nubi is also simpler than Sudanese Arabic in terms of acquisition and/or processing. I will challenge that conclusion, at least in part.

³ In this basic triad, phonology reduces to the fact that lexical items must have perceptible forms.

deciding which among the competing morphological theories might be the most adequate (or the least inadequate) to the ultimate goal of finding out the answers. My claim, which I will try to bear out, is that inferential-realizational theories such as Paradigm Function Morphology (PFM, Stump 2001) that refuse the notion of lexical morphemes are better suited to account for the fate of inflection in p/c formation than are lexical-incremental or lexical-realizational theories that entertain such a notion, the best-known representative of the latter being Distributed Morphology (DM, Halle & Marantz 1993; Marantz 1997).⁴

Another thing that should come out from the present examination is that the choice of a morphological framework is inherently related to the theoretical stance one takes with respect to p/c formation itself. Inasmuch as theories that favour UG factors and maximize the role of children such as the Language Bioprogram Hypothesis (LBH, Bickerton 1981, 1984, 1988) say anything about morphology (which they seldom do), they strongly tend to side with lexical morphemic theories. The reason for such a recurring match is that both these theories and the LBH are syntactocentric in the sense of Jackendoff (1997), meaning they consider syntax the central and defining dimension of human language. In theories that postulate lexical morphemes, therefore, morphologically complex forms – even of such moderate complexity as English *cats* or Guinea-Bissau Kriyol *gatus* – are built stepwise through the SYNTACTIC adjunction of a root (the underived, uninflected kernel) to various functional heads such as Number, immediately provided with a phonological form (e.g. /s/) as in Lieber’s theory (see footnote 4) or spelled out in a later component, the Vocabulary, as in DM. Kriyol *gatus* will then be formally represented as in (1), where $\sqrt{\circ}$ notates the root /gatu/ and ghostly $[\sqrt{\circ} \text{gatu}]$ indicates the starting point of the root’s head-to-head movement upward:

$$(1) [\text{NUMP} [\text{NUM}^{\circ} [\text{NUM}^{\circ} [\sqrt{\circ} \text{gatu}]] [\text{NUM}^{\circ} \text{PL}]]] [\sqrt{\text{P}} [\sqrt{\text{V}} [\sqrt{\circ} \text{gatu}]]]]]$$

For morphological theories such as PFM, in contrast, morphological phenomena are not a product of the fundamental and all-pervasive syntactic apparatus, here instantiated as so-called “word syntax”, but they constitute a fully autonomous component, no less fundamental than syntax, perhaps even more so considering that only human natural languages show such phenomena, as pointed out above. The basic analytical tool of these theories is the realization rule (RR), as exemplified in (2) and (3) (Ackerman & Stump 2004):

$$(2) X_N \sigma \{ \text{NUM } sg \} \Rightarrow X$$

$$(3) X_N \sigma \{ \text{NUM } pl \} \Rightarrow X \oplus s$$

Care should be taken not to mistake these rules for procedural instructions similar to derivationally interpreted phrase structure rules. They are functions in which the double-shafted arrow means the same as the logical “if-then” operator. They state that, if the feature consisting in the attribute NUM(ber) valued as singular or plural, applies to a nominal stem X, e.g. /gatu/, then the result of such a functional application is either the unchanged stem, *gatu*, or the concatenation of /s/ to the stem, i.e. *gatus*. This /s/ is NOT a morpheme existing by itself in the lexicon as in DM, it is merely that portion of the word-form *gatus* whose presence correlates with the plural value of the number feature.

Inasmuch as (2) and (3) constitute a block (they go together), the two forms *gatu* ‘cat’ and *gatus* ‘cats’ define the cells of a paradigm that exhaustively contains them. Paradigms are central for realizational theories, whereas they are theoretically uninteresting in frameworks such as DM. I will return to this crucial point.

⁴ See Stump (2001) for the typology of morphological theories. An example of lexical-incremental theory is Lieber (1992)

Realizational theories actually consider paradigmatic organization the primary cause of all morphological phenomena, inflectional as well as derivational, as well as a crucial and defining property of natural languages. It follows that scarcity or absence of inflectional morphology represents an unexpected state of affairs for such theories, whereas it is fully unremarkable for theories which view morphology as syntax reaching below word level, so they can easily regard absence of such an extension as the ideal natural languages would conform to were it not for historical accidents.

This is clearly the stand taken by the LBH and by McWhorter's (1998) Creole Prototype Theory (CPT). True, their authors build upon distinct conceptual frameworks. In the LBH's later version (Bickerton 1988; also see Veenstra 2008) p/c morphological poorness follows from the assumption that p/c's represent almost fully unmarked implementations of UG as conceived of in a Principles and Parameters framework. CPT's theoretical roots, in contrast, plunge into typological research and grammaticalization theory, so its claim is that p/c's are simply too recent for enough content words to have grammaticalized into clitic or affixal functional items. Both theories share the same basic assumption, however, namely that the unmarked state for a natural grammar is to be almost all lexicon and syntax, with as little variation as possible in the phonological form of the lexical items that syntax combines.

Realizational theories, quite on the contrary, make us expect fairly rich inflections and derivations to be a normal and common property of natural languages. They are therefore inherently attuned to accounts of p/c formation that view it as primarily a special case of unguided second language acquisition (SLA) by adults (Andersen 1983, 1984; Becker & Veenstra 2004; Plag 2008). Studies in the domain indeed all point to the fact that adult unguided SLA, although prone to reduce morphological complexity, does not necessarily or even regularly lead to its complete eviction (Pienemann 1998; Plag 2008). Bakker (2002) even shows that many pidgins include more morphological phenomena than do creoles. The difference is that those phenomena appear to be fossilized and erratic in the former, whereas the latter regularize what they keep – but keep something they do! And they create as well.

Now, assessing the extent of what they keep and create also depends on the morphological framework one works in and, therefore, on the p/c formation theory one adopts. For instance, does the concatenation of an aspect marker and a verb pertain to syntax or to morphology? Supporters of “unescapable syntax” (Marantz 1997) would certainly answer that of course it pertains to syntax, since morphological marking only occurs if the verbal head adjoins to the functional head that contains the relevant feature in the way schematized in (1) – with the consequence that suffixation is the only direct way inflection is expressed (see e.g. DeGraff 1997 on Haitian; Kremers 2005 on Arabic pidgins).

Realizational morphology, in contrast, has no prejudice concerning affix placement. Insofar as the marker and the verb it modifies must be strictly adjacent, it can very well view such sequences as instances of prefixation or procliticization entirely in the purview of the morphological component.⁵ More on this later on.

2. Purpose and outline of the article

As already hinted, the present study raises the following question: Why are morphological phenomena in p/c's always relatively scarce, but never absent? The basic assumption I build on in order to try and provide an answer to this question is that realizational theories of morphology and genetic theories in terms of unguided adult SLA are inherently attuned to each other, and their union allows for a much better account of p/c morphological trimming

⁵ See Stump (2001:19) for an account of the actual prevalence of suffixation that does not appeal to head movement.

than do syntactocentric theories both of morphology and of p/c formation. For the demonstration to be as convincing as possible, I will focus on a situation where the contrast is especially marked, and I will compare the Arabic-related creole Nubi with its lexifier Egyptian / Sudanese Arabic (E/SA).⁶

The study will therefore proceed as follows. In section 3 below I informally introduce Nubi, its history and typological character. In the following two sections, I give elementary sketches of E/SA and Nubi inflectional morphologies that suffice for my purposes. Then, in section 6, I propose a formal treatment of E/SA and Nubi plural formation in a realizational, more precisely PFM framework. In section 7 I try to delineate what exactly happened in the transition from E/SA to Nubi and I propose an answer to the question of why it happened thus in section 8. Finally, in the concluding section 9, I point out the inherent affinity between my interpretation of the major event responsible for the morphological discrepancy between E/SA and Nubi and the choice of the best morphological theory, my claim being that theories that assume lexical morphemes cannot account for the said discrepancy, whereas realizational theories which put paradigms in centre stage associated with an SLA-based view of p/c formation do account for it.

3. Nubi: an informal presentation

Nubi is an Arabic-related creole, presently spoken by about 50 000 people in Uganda and Kenya (Owens 1977; Heine 1982; Luffin 2005; Wellens 2005). Its ancestor is a pidgin Arabic that formed in the 1820's in southern Egypt among enslaved black soldiers from the Nuba mountains of northern Sudan – hence the name of the language and its speakers – who were forcefully recruited into the Turco-Egyptian army the Khedive Mehmet Ali was assembling in order to conquer the whole of Sudan. (See Wellens 2005, Chapter 1, for a detailed account of the history of Nubi.)

As they were drilled into soldiers, the slaves acquired some knowledge of dialectal Arabic that was the language of command and the only common medium in the Khedive's army. Such learning as they achieved was probably entirely “on the job”, as there is no mention of any form of formal tuition. It was unguided SLA by adults, probably young adults fit for soldiery and with a culturally inherited knack for multilingualism, but well past their native proficiency for L1 acquisition. A stabilized interlanguage or Basic Variety (BV) or pidgin thus formed, which became their distinctive speech (Klein & Perdue 1997; Becker & Veenstra 2004; Plag 2008). It is also possible that some or many of them already knew the Pidgin Arabic lingua franca that developed during the early nineteenth century in southern Sudan in the context of slave and ivory trade, an offshoot of which is called Turku and was described in the beginning of the twentieth century (Tosco & Owens 1993; Khamis & Owens 2007). This too was the product of unguided SLA in any event. Alongside such partial linguistic integration, the new soldiers converted to Islam, which was to prove an essential factor in their new identity later on.

During most of the nineteenth century, Nubi soldiers were posted in forts in Sudan. They took local wives but they and their children – who followed them in the military career – kept the pidgin as their own language, which expanded into an Arabic-related pidgincreole (Bakker 2002).

⁶ The Egyptian and Sudanese dialects of Arabic differ from each other, albeit not enormously. Conflating them as I do here should therefore stir no scandal, especially since I am adopting a creolist's, not a semiticist's stance. Whenever there is good reason to distinguish Egyptian Arabic (EA) from Sudanese Arabic (SA), however, I will do so.

In 1890, the Nubi regiments retreated southwards before the Mahdist army fighting Anglo-Egyptian domination. They finally reached Uganda, then Kenya, where they were integrated into the colonial British troops and settled. There Nubi finally became the full native language of an enduring social and linguistic community.

Nubi draws most of its vocabulary from E/SA. Given its first speakers' origins, its substrate consists in a number of not too well documented Kordofanian (Niger-Congo) and Nilo-Saharan languages. Substrate impact is therefore hard to assess, but it seems to have been rather weak (Owens 2001). Its final abode brought it into contact with two adstrates, Luganda in Uganda and Swahili in Kenya, whose influence was only lexical, as providers of loanwords. English was also a source of borrowings.

Nubi is an especially interesting case for the study of p/c formation, for two reasons. First, its lexifier E/SA is a highly inflected language including non-concatenative processes in addition to affixational morphology, both diversified across a quantity of word classes. Insofar as p/c formation always involves unguided adult SLA AT SOME STAGE – a historical fact nobody can deny whatever their global theory may be (Plag 2008; Siegel 2008) – acquiring a command of E/SA in such an unfavourable context is probably more of a challenge than it is with French or even Portuguese.

Secondly, although Nubi lacks much of E/SA inflections, it doesn't lack inflection entirely. In fact, Nubi might be dubbed a highly inflected creole if assessed by the usual standard of Caribbean creoles – but taking West African and Indian Portuguese-related creoles into account might lead one to revise this assessment to some extent (see, e.g., Luís 2008; Kihm to appear).

Attempting an account of Nubi formation therefore requires that we answer two apparently conflicting questions: (a) Why did Nubi retain so comparatively little of its lexifier's inflections? (b) Why did it retain comparatively so much? Before we are in a position to perhaps answer these questions, we must sketchily describe E/SA and Nubi inflections in order to compare them and see what can explain the change from one to the other.

4. A sketch of E/SA inflectional morphology

4.1. Nominal inflection: plural formation⁷

E/SA nominals (i.e. nouns and adjectives) may be divided into two complementary sets. On the one hand, there are nominals set apart by some morphosyntactic and/or semantic peculiarity: nominalized participles, nouns of profession, unassimilated borrowings, etc. The other set consists in unremarkable nominals. Nominals in the special set pluralize suffixally; unremarkable nominals pluralize “internally” (Mitchell 1962:37-39; Gadalla 2000:140ff; Watson 2002:186ff.; Dickins 2007). Internal (“broken”) plurals may thus be regarded as the default option.

Plural suffixes are four: *-ín*, *-áat*, *-íyya*, and *-áan*. The *-ín* suffix goes with (i) nominalized masculine participles, e.g. *mušállim* / *mušallimín* ‘teacher(s)”; (ii) masculine

⁷ There is a dual in E/SA. Since it left no traces in Nubi, I leave it aside. In Classical and Standard Arabic, nouns also inflect for case. Case inflection disappeared in the dialects, perhaps even before Arabic spread out of the Arabian Peninsula (Owens 2006).

nouns denoting professions and characterized by a *CaCCaaC* template, e.g. *farráan* / *farranín* ‘baker(s)’;⁸ (iii) most adjectives irrespective of gender.

The *-áat* suffix goes with (i) masculine and feminine nominals with designated templates, including feminine nominalized participles, e.g. *muṣállima* / *muṣallimáat* ‘woman / women teacher(s)’; (ii) feminine nouns ending in *-íyya*, e.g. *ḥanafíyya* / *ḥanafíyyáat* ‘tap(s)’; (iii) unintegrated loanwords, e.g. *ʔutubíis* / *ʔutubiisáat* ‘bus(es)’, *baskalítta* / *baskalittáat* ‘bicycle(s)’; *telefoon* / *telefonáat* ‘telephone(s)’; (iv) verbal nouns, e.g. *miṣákxa* / *miṣaksáat* ‘quarrel(s)’; (v) singulatives of collective nouns, e.g. *xóoxa* ‘a peach’ / *xooxáat* ‘a few peaches’ (*xoox* ‘peaches’); (vi) a few nouns denoting relationships (in addition to other processes), e.g. *ʔumm* / *ʔummaháat* ‘mother(s)’, *ʔax* / *ʔixwáat* ‘brother(s)’, *bint* / *banáat* ‘daughter(s)’.

The *-íyya* suffix pluralizes nouns of trades ending in *-gi* or *-i*, e.g., *gazmági* / *gazmagéyya* ‘cobbler(s)’, *ḥaráami* / *ḥaraméyya* ‘thief/thieves’, etc.

Finally, *-áan* nearly always follows a different stem than that of the singular, e.g. *šabb* / *šobbáan* ‘young man/men’, *faar* / *firáan* ‘mouse/mice’. It is not clear that such stem alternations should be considered instances of internal pluralization in E/SA, which they probably are in Classical Arabic (Ratcliffe 1998; Kihm 2006). *-áan* is the sole plural exponent in a few nouns, e.g. *ḥeeṭ* / *ḥeeṭáan* ‘wall(s)’.

The occurrence of *-ín*, *-áat*, *-íyya*, or *-áan* is thus predictable to a large extent. One main cause for uncertainty is that nondescript feminine nouns in *-a* form either external plurals in *-áat* or (more often) internal plurals : cf. *ráhba* / *rahbáat* ‘nun(s)’ vs. *fúuṭa* / *fówaṭ* ‘napkin(s)’.

Informally described, internal (or “broken”) pluralization consists in changing the template of the singular stem without affecting the consonant sequence that constitutes the root: e.g. *kalb* / *kelaab* ‘dog(s)’ ($\langle CaCC \rangle$ / $\langle CeCaaC \rangle$), *ṣaḥn* / *ṣuḥúun* ‘plate(s)’ ($\langle CaCC \rangle$ / $\langle CuCuuC \rangle$), *ketaab* / *ktob* ‘book(s)’ ($\langle CeCaaC \rangle$ / $\langle CCoC \rangle$), *šánṭa* / *šúnaṭ* ‘bag(s)’ ($\langle CaCCa \rangle$ / $\langle CuCaC \rangle$), *kibíir* / *kubáar* ‘big’ ($\langle CiCiiC \rangle$ / $\langle CuCaaC \rangle$).⁹

Watson (2002:164) lists 32 plural templates in the Cairo dialect (Cairene). As the examples show, there is no one-to-one relationship between templates and number (compare *kelaab* ‘dogs’ and *ketaab* ‘book’), even though some templates (e.g. *CaCC*) always carry singular meaning, whereas others (e.g. *CuCuuC*) are always plural. Moreover, to the difference of suffixed plurals, internal plurals do not predictably correlate with their corresponding singulars, but statistically. Correlations never exceed 50% probability for the triconsonantal (3C) root nouns that constitute the majority of the basic nominal vocabulary (Levy 1971).¹⁰ Many, if not most pairings must therefore be memorized. Only internal plurals of nominals with 4C roots are regular and fully predictable: cf. *márkib* / *maráakib* ‘ship(s)’

⁸ I will return on the notion of template. Let me just define it for the present as a fixed sequence of virtual consonants and actual vowels. Underlined adjacent consonants are identical. Doubled vowels represent long vowels.

⁹ Many internal plurals show a prefixed augment *a-* in addition to internal modification as in *ṭefl* / *aṭfáal* ‘child(ren)’.

¹⁰ The consonantal root will be discussed in section 6.

((CvCCvC) / <CvCaaCiC>), *fingáal* / *fānagíil* ‘cup(s)’ ((CvCCvvC) / <CvCaCiiC>). Internal pluralization extends to recent loanwords provided pseudo consonantal roots can be teased out: cf. *film* / *ʔafláam* ‘film(s)’ (pseudo-root √flm, <CiCC> / <’aCCaaC>), *duktúur* / *dakátra* ‘doctor(s)’ (pseudo-root √dktr, <CvCCvvC> / <CaCaCCa>).

4.2. Verbal inflection

Verbal inflection for aspect and agreement features shows the same mixing of internal and external devices as pluralization does, with the difference that both inflectional means generally concur instead of being distributed across distinct word-classes as with nominals.

Aspect in E/SA consists in the contrast of a perfective vs. an imperfective paradigm. Perfective paradigms are characterized by the quality of the vowels separating the root consonants and the fact that the agreement features person, gender, and number are realized as suffixes, except in the 3rd person masculine singular which reduces to the bare stem. The following paradigm from Dickins (2007) illustrates:¹¹

	Singular	Plural
1	<i>darasta</i> ‘I studied’	<i>darasna</i> ‘we studied’
2m	<i>darasta</i> ‘you studied’	<i>darastu</i> ‘you studied’
2f	<i>darasti</i> ‘you studied’	(<i>darastan</i> ‘you studied’)
3m	<i>daras</i> ‘he studied’	<i>darasu</i> ‘they studied’
3f	<i>darasat</i> ‘she studied’	(<i>darasan</i> ‘they studied’)

Table 1: Perfective paradigm in Khartoum (Sudan) Arabic

Imperfective paradigms show different vowel qualities and agreement features are realized as prefixes as well as suffixes as shown below:

	Singular	Plural
1	<i>adrus</i> ‘I study’	<i>nadrus</i> ‘we study’
2M	<i>tadrus</i> ‘you study’	<i>tadrusu</i> ‘you study’
2F	<i>tadrusi</i> ‘you study’	(<i>tadrusan</i> ‘you study’)
3M	<i>yadrus</i> ‘he studies’	<i>yadrusu</i> ‘they study’
3F	<i>tadrus</i> ‘she studies’	(<i>yadrusan</i> ‘they study’)

Table 2: Imperfective paradigm in Khartoum (Sudan) Arabic

Notice how in 2F.SG *tadrusi ta-* expresses person 2, whereas *-i* expresses feminine gender (compare *tadrus*) and singular number (compare *tadrusan*). In 3F.SG *tadrus*, in contrast, *ta-* expresses all three features 3rd person, feminine gender, and singular number (compare *yadrus* and *yadrusan*).

Tenses such as future or more specific aspectual meanings such as progressive are expressed through prefixes attached to the imperfective forms, e.g. *badrus* /bi-adrus/ ‘I will

¹¹ 2PL.F and 3PL.F are set between brackets in Tables 1 and 2 because they are rarely used forms.

study’, or through auxiliaries also preceding the imperfective forms, e.g. *gaaʕid adrus* ‘I am studying’.¹²

This is of course extremely sketchy, but it will suffice for our present purposes. We now pass to an examination of Nubi inflection.

5. A sketch of Nubi inflectional morphology

5.1. Nominal inflection: plural formation

Pluralization in Nubi proceeds essentially through suffixation (Wellens 2005:75-77). Internal pluralization disappeared to the exception of a handful of items, e.g. *binía / bána* ‘girl(s)’ (cf. E/SA *bint / banáat*), *kebír / kubár* ‘big director(s)’ (cf. E/SA *kibír / kubáar* ‘big’), *towíl / tuwál* ‘long’ (cf. E/SA *ṭawíl / tuwáal*), probably best treated as cases of suppletion as suggested by (a) their isolation and non-systematicity, (b) the fact that such plural forms can be “repluralized” without any change in meaning, as shown by *kubarín*, i.e. *kubár* plus the *-ín* plural suffix (see below), a property they share with clearly suppletive plural forms: cf. *marya* ‘woman’ vs. *nuswán* or *nuswaná* ‘women’, the second form including the *-á* plural suffix (see below).

The two most frequent suffixes are *-(y)á* and stress linked to the final vowel, analysable as a suprasegmental suffix. Examples of the first are *malím / malimá* ‘teacher(s)’, *núbi / nubiyá* ‘Nubi(s)’, *galamóyo / galamoyá* ‘goat(s)’; examples of the second are *gidída / gididá* ‘chicken(s)’, *siádum / siadúm* ‘owner(s)’, *béle / belé* ‘country/ies’.

The origin of stress shift as a pluralizing device deserves a few words of explanation. Consider *gidída*’s EA etymon *gidíida*, the feminine of *gidíid* ‘new, young’.¹³ It is stressed on the penultimate long syllable. Its plural *gidiidáat* gets stress on the final super-heavy syllable (a long vowel in a closed syllable). The loss of final consonants and of vowel length in Nubi then makes the plural identical to the singular but for the position of stress.

The same account applies to *béle / belé* vs. EA *bálad / beláad*: singular *béle* keeps the initial stress of *bálad*, plural *belé* keeps the final stress of *beláad*, final /d/ deletes; vowels are levelled; only stress position now expresses the number contrast.

Stress shift then grammaticalized as a plural exponent and was carried over to non-E/SA items such as *siádum / siadúm* (origin unknown). Once grammaticalized, final stress as an exponent of plurality can indeed be analysed as a suprasegmental suffix that links to the closest stressable element, viz. the final vowel of the root. The functionless penultimate stress of the singular (or numberless) form deletes in the plural owing to the general principle of one main stress per phonological word. No adjective seems to pluralize in this way.

Other suffixes are limited to a few lexemes, e.g. *sókol / sokolín* ‘thing(s)’, *ter / terán* ‘bird(s)’, *sókol / sokolná* ‘thing(s)’, *nyerekú / nyerekuká* ‘child(ren)’, *bab / babú* ‘door(s)’.

¹² *Gaaʕid* is an active participle meaning ‘sitting’. Participles agree in gender and number with their subjects, hence the paradigm *gaaʕid* (masculine singular), *gaaʕda* (feminine singular), *gaaʕdiin* (masculine plural), and *gaaʕdaat* (feminine plural).

¹³ Initial /g/ for /j/ tells us this word must come from EA.

As shown by one of these examples, *sókol*, a lexeme can pluralize in more than one way, here *sokolín* and *sokolná*, also *sokolá*. All these forms mean ‘things’, apparently without any referential or stylistic overtones. Multiple plurals are found in standard as well as dialectal Arabic, owing to the koiné character of the former which adopted forms from different Arabian dialects. They are said to be common as well in the substrate languages that contributed to the formation of Nubi (Owens 1991).

A crucial contrast between E/SA and Nubi is that the association of a given suffix with a noun is unpredictable in Nubi. In other words, to the difference of its lexifier, Nubi has no nominal word-classes independently definable according to semantic, morphological, or phonological criteria on which the choice of a given suffix depends. Not only does this absence of word-classes for pluralization correlate with the total loss of the gender contrast in Nubi, but with deeper changes as well to which I shall return. Meanwhile, we can observe that the main upshot of such changes is that Nubi, perhaps untypically for a creole language, turns out to be more complex, or a least more opaque and less rule-governed than its lexifier in the domain of number expression.¹⁴

5.2. Verb inflection

There is nothing in Nubi like the verbal paradigms of E/SA shown in Tables 1 and 2. Yet, the aspect system of Nubi also consists semantically in a perfective vs. imperfective contrast. Aspect features are not expressed through internal inflections and affixes, however. Perfective is expressed through the verb’s bare stem, imperfective through a proclitic marker preceding the verb stem, which makes Nubi a typical creole, which we have just seen it is not in the nominal domain, at least as far as morphology is concerned (see footnote 14). Also typical are the exclusive expression of agreement features through pronouns and the interpretation of perfective as referring to past eventualities with dynamic verbs, but to present ones with state verbs. All these properties are illustrated in (4) and (5):

(4) *úwo kátif*.

3SG write
S/he wrote.

(5) *úwo áruf*.

3SG know
S/he knows.

The imperfective marker is *gi*, a further grammaticalization of the E/SA progressive auxiliary participle *gaaʿid* mentioned above:

(6) *úwo gi kátif*.

3SG IPF write
S/he’s writing ~ S/he writes.

Tense specifications are also expressed by preverbal markers, namely *bi* for future and *kan* for anteriority (Wellens 2005:153 [374], 156 [387]):

¹⁴ Another far-reaching difference between E/SA and Nubi is in the semantic and pragmatic domain. As in many creoles and contrary to E/SA, pluralization is cognitively and contextually anchored in Nubi : count nouns are marked as plural only if there is some relevance to do so beyond the actual cardinality of the referent (Kihm 2007).

(7) *ána bi logó fógo be.*

1SG FUT find in.it house
I will find a home in it.

(8) *kalám al gibél kan rasulú nána, ána so kalá.*

thing REL before ANT send-PASS to-1SG 1SG do already
The thing which was sent to me before, I did it already.

The imperfective marker combines with auxiliary verbs to yield more elaborated tense specifications, as shown in (9) and (10) (Wellens 2005:163 [413]):

(9) *úwo gi ja kátif.*

3SG IPF come write
S/he will write (on a specific occasion).

(10) *rután gu rwa gi so sunú?*¹⁵

language IPF go IPF do what
What is the [Nubi] language doing gradually?

Where Nubi ceases to be typical is in the fact that it does show some affixational verbal inflection, and that is for passive voice. Passive inflection involves shifting stress from its usual initial position to the last syllable: e.g. *kásulu* ‘to wash’ vs. *kasulú* ‘to be washed’. In oxytonic verbs ending in an open syllable (e.g., *werí* ‘to show’) stress becomes stronger and/or pitch becomes higher and the vowel may be lengthened: *werí(:)* ‘to be shown’.¹⁶ In monosyllabic verbs, the contrast is of tone only: e.g. *so* ‘to do’ with low tone vs. *só* ‘to be done’ with high tone. In passive verbs ending in a closed syllable, either stress or high tone falls on the last syllable or the stem is extended with a copy of the last vowel, which receives stress or high tone: e.g. *gówgow* ‘to strengthen’ vs. *gowgów* ‘to be strengthened’, *nyákam* ‘to capture’ vs. *nyakamá* ‘to be captured’ (Wellens 2005:177-179).

As with pluralization, I analyse final stress and/or high tone expressing passive voice as a suprasegmental affix attached to the last stressable and/or intonable segment of the stem. The only formal difference with nominal plurals is that this last segment may be added to the stem in a few cases (rarely according to Wellens 2005:178).

6. A formal treatment of E/SA and Nubi inflectional morphology

Comparing E/SA and Nubi inflectional morphologies raises two central questions: (a) Why did internal inflection disappear in Nubi, whereas external, affixational inflection did not? (b) Why is all inflection, internal as well as external, absent in Nubi verbs, to the exception of stress or high tone suffixation?

Our first step in trying to answer these questions must be to formalize the inflectional phenomena described in the foregoing two sections, since only in this way shall we be able to

¹⁵ *Gu* is an allomorph of *gi* in the context of the following labial /w/. The meaning of (10) is that of an iterative, open-ended future.

¹⁶ There is a debate about whether Nubi is primarily a tone language with a high-low contrast as argued by Heine (1982) or a stress language with a pitch correlate, the position of Wellens (2005). I do not take sides in this discussion.

reach a deeper understanding of how E/SA and Nubi really differ. The realizational format I will adopt in connexion with an SLA-based account of p/c formation should allow us to understand not only what happened, but also why it happened thus, something I will argue syntax-centred morphological frameworks and other p/c formation theories are incapable of. The inherent relationship between types of morphological theories and types of p/c formation theories will hopefully clearly appear as well.

6.1. A few general points about E/SA inflectional morphology

The following account will be quite partial as there is no need (and no room), given the aim of the present study, for a complete formalization of all the inflectional phenomena mentioned in section 4. Before we come to it, however, a rapid overview of the general principles of Arabic inflectional (and derivational) morphology will probably prove useful to make it fully accessible to readers unfamiliar with Semitic languages.¹⁷

Arabic morphology is founded on a root-and-template principle. Arabic roots consist in ordered strings of consonants, most often three, minimally two and maximally five, with some constraints on possible sequences: e.g. the first two consonants or the first and the last ones cannot be identical or even homorganic ($*\sqrt{CCC}$, $*\sqrt{CC\bar{C}}$), whereas there is no such ban on the last two consonants ($\sqrt{CC\bar{C}}$) (Greenberg 1950). Tables 1 and 2 above clearly show that all verb forms in them share the 3C root \sqrt{drs} .

“A lexeme’s ROOT is its ultimate default form, devoid of any overt inflectional marking and therefore potentially a bound expression” (Stump 2001:33). In relation to this definition, consonantal roots have the distinctive property that they MUST be bound, meaning they cannot serve as actual word-forms since they are discontinuous and unpronounceable pending vowel insertion. Syllabic roots, in contrast, can be coterminous with word-forms.

Consonantal roots therefore have to be crossed with morphophonological templates to be realized within word-forms. As mentioned in footnote 8 and amply illustrated in section 4, templates are sequences of virtual consonants and actual vowels. Root and template crossing is informally schematized in (11) and (12) with \sqrt{klb} and \sqrt{drs} the roots and $\langle CaCC \rangle$ and $\langle CaCaC \rangle$ the respective templates:

(11) $\sqrt{klb} \times \langle CaCC \rangle = kalb$ ‘dog’

(12) $\sqrt{drs} \times \langle CaCaC \rangle = daras$ ‘he studied’

The outputs of the crossing, *kalb* and *daras*, are STEMS and word-forms at the same time. Paradigm 1 shows that suffixes can accrue to *daras qua* stem. The vowel in *kalb* does not express any particular feature, to the difference of the /a... a/ “melody” of *daras* which correlates with perfective aspect (compare imperfective *-drus*), but it may be lexically distinctive: cf. *saqt* ‘dew’ vs. *siqt* ‘miscarried foetus’ vs. *suqt* ‘sparks flying from a flint’, all sharing the root $\sqrt{sq\bar{t}}$ of the verb *saqata* ‘he fell’. Such cases where distinct nominal lexemes are phonologically differentiated by their vowels only are rare.¹⁸ Owing to their existence, however, vowels cannot be said to be present just for pronounceability, even in items like *kalb* which do not enter any such minimal pairs (no $*kilb$ or $*kulb$). Templates crossed with

¹⁷ I use “Arabic” *tout court* whenever it is unnecessary to distinguish between classical/standard and dialectal Arabic.

¹⁸ Vowels in verb forms are always functional, so the possibility cannot arise. These examples are from Classical Arabic.

roots may achieve lexical distinctions, in other words, in addition to yielding distinct forms of the same lexemes (as in *kalb / kelaab* ‘dog / dogs’ or the forms in Tables 1 and 2).

On the semantic side, it is a generally held view that the root conveys some general or basic meaning most purely expressed either by a simplex noun such as *kalb*, or by a verb in the so-called, underived Form I (e.g. *daras*), and then variously modulated by the other root-sharers: “The Semitic languages present a system of consonantal roots (mostly triconsonantal), each of which is associated with a basic meaning range common to all members of that root” (Moscati et al. 1980:71). Together with the formal characterization, this notion tends to impart substantial reality to the root, to make it an actual element of Arabic speakers’ internalized grammar. Indeed, native Arabic speakers seem to be quite aware of the linguistic reality of the root as shown by language games, aphasic symptoms, and the integration of loanwords (Prunet 2007; Prunet, Béland & Idrissi 2000).

6.2. Accounting for E/SA plural formation in a realizational format

Let us divide the E/SA nominal lexicon into two inflection classes (IC’s) according to morphosemantic criteria: IC1 includes nominals with designated morphological and/or semantic characters, IC2 includes unremarkable nominals (all the rest). Nominals pertaining to IC1 pluralize affixationally, nominals in IC2 do so internally. A partial generalization is that nominals resulting from some operation of derivational morphology pertain to IC1, whereas simplex nominals showing no more than the crossing of a root with a non-derivational template pertain to IC2. There are exceptions, though.

The best-known theory of internal pluralization in Arabic is the prosodic theory of McCarthy (1981) and McCarthy & Prince (1990a-b) (also see Ratcliffe 1998, Watson 2002). Another theory makes use of the notion of morphological site within a linear CV representation, so that internal pluralization is analysed as a kind of infixation (Asfour 2001, Kihm 2006). The realizational theory presented here retains aspects of both theories. It is like the prosodic theory insofar as it does not appeal to morphemes in the sense of discrete chunks of form-meaning association; it is like the site theory in highlighting a specific domain in which plural exponence takes place.

Both types of plurals are accounted for through realization rules (RR’s) in the format illustrated in (2) and (3). For external plurals in IC1, I only give the rule block necessary to account for the most promiscuous suffix, namely *-áat* (cf. 4.1). The ten following rules should cover all cases:

(13) IC1 RR block for plural formation through *-áat* suffixation

- a. $X_N, \sigma \{ \text{NFORM } u, \text{GDR } fem, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$
- b. $X_N, \sigma \{ \text{NFORM } ppl, \text{GDR } fem, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$
- c. $X_N, \sigma \{ \text{NFORM } \langle \dots C\acute{i}yy \rangle, \text{GDR } fem, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$
- d. $X_N, \sigma \{ \text{NFORM } \langle \dots CaaC \rangle, \text{GDR } u, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$
- e. $X_N, \sigma \{ \text{NFORM } \langle CaCaC \rangle, \text{GDR } fem, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$
- f. $X_N, \sigma \{ \text{NFORM } \langle mvCaCC \rangle, \text{GDR } fem, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$
- g. $X_N, \sigma \{ \text{NFORM } nil, \text{GDR } u, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$
- h. $X_N, \sigma \{ \text{NFORM } vn, \text{GDR } u, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$
- i. $X_N, \sigma \{ \text{NFORM } singulative, \text{GDR } fem, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$
- j. $X_N, \sigma \{ \text{NFORM } spplstem, \text{GDR } u, \text{NUM } pl \} \Rightarrow X \oplus \acute{a}at$

X's in these rules are stems as defined above. Being a gender exponent, final *-a* of feminine nominals does not pertain to the stem, hence /muʕallim-áat/, not */muʕallima-áat/, for 'women engineers'. NFORM means "nominal form". Its value is a templatic description which may consist in a full template (e.g. ⟨CaCaC⟩), a template's portion (e.g. ⟨...CaaC⟩, i.e. a long /a/ between the template's last two consonants), or a label regularly associated with a template, e.g. *ppl* meaning "participle" and pointing to a template that consists in an *mv*-prefix (*v* = /i/ or /u/) followed by the imperfective stem.

In (13a) NFORM is undefined (*u*), implying that the rule applies to feminine nominals with unremarkable templates, e.g. *ʔáwla* / *ʔawláat* 'backgammon board(s)'. Since rule block (13) is an attribute of IC1, (13a) cannot affect IC2 unremarkable feminine nominals which form internal plurals, e.g. *šánʔa* / *šónaʔ* 'bag(s)'. Nominals affected by (13a) therefore belong to the exceptions alluded to above, and for them inflection class has to be lexically stipulated, as it cannot be deduced from the word's form.

Rule (13b) accounts for nominalized feminine participles such as *muʕállima* / *muʕallimáat* 'woman / women teacher(s)', and (13c) for feminine nominals whose (derived) stem ends in *-iyy*, e.g. *ħanafíyya* / *ħanafíyyáat* 'tap(s)'. Rules (13d-f) apply to nominals with designated templates or template parts such as *šaháada* / *šahaadáat* 'certificate(s)' (long /aa/ between C₂ and C₃), *ħášara* / *ħašaráat* 'insect(s)', *mixádda* / *mixaddáat* 'pillow(s)', *magállla* / *magalláat* 'magazine(s)'. Notice the gender feature is undefined in (13d), as masculine nominals also fall in the purview of the rule, e.g. *ħisáab* / *ħisaabáat* 'account(s)'.
 Rule (13g) is for loanwords of either gender that have no value at all for NFORM (*nil*), as distinct from having an undefined value, e.g. *ʔutubíis* / *ʔutubiisáat* 'bus(es)', *baskalítta* / *baskalittáat* 'bicycle(s)', etc.

In (13h), *vn* means 'verbal noun', always with a predefined template, e.g. *miʕáksa* / *miʕaksáat* 'quarrel(s)' (cf. *ʕáakis* 'he quarrelled'), *taʕlíim* / *taʕliimáat* 'teaching, instruction' (cf. *ʕállim* 'he taught'). Verbal nouns are masculine or feminine, hence undefined gender in the rule.

Rule (13i) applies to singulatives of collective nouns, e.g. *xóoxa* 'a peach' / *xooxáat* 'a few peaches' (cf. *xoox* '[a quantity of] peaches').

Finally, (13j) concerns a few nouns denoting relationships, e.g. *ʔumm* / *ʔummaháat* 'mother(s)', *ʔax* / *ʔixwáat* 'brother(s)', *bint* / *banáat* 'daughter(s)', which show special stems in the plural, notated as the value *splstem* of the attribute NFORM.

Internal plurals would require one rule per plural template. The list in Watson (2002:164) suggests that the generalization proposed for Classical Arabic by Kihm (2006) carries over to E/SA, however: internal pluralization involves stem extension through infixation of a Cv syllable between the 2nd and 3rd root consonants. This syllable is realized via the low glide /A/, the high back glide /U/, or the high front glide /I/ linking to the onset or the nucleus of the syllable (something only glides can do). If the glide links to the onset, it shows up as a long /aa/, /uu/ or /ii/ according to independent principles of Arabic phonology, hence so-called iambic plurals such as *loon* / *alwaan* 'colour(s)', *šaħn* / *šuhúun* 'plate(s)', *ħomáar* / *ħemíir* 'donkey(s)'; if to the nucleus, as a short /a/ or /u/ vowel (short /i/ does not seem to occur), hence trochaic plurals such as *šánʔa* / *šónaʔ* 'bag(s)'. Hence metarule (14) for internal plurals of nominals with 3C or 4C roots, where Cv is realized as Gv or Cg (G/g =

glide); and the general phonological equations (15) and (16), where G/g_t notates a glide with a given timbre, v a virtual vowel, and v_t a vowel with the same timbre as the glide:

$$(14) X_N, \sigma \{ \text{NFORM } \langle C \dots C \dots C(\dots C) \rangle, \text{GDR } u, \text{NUM } pl \} \Rightarrow X \{ C \dots C \oplus C_v \oplus C(\dots C) \}$$

$$(15) G_t v = v_t v_t$$

$$(16) C g_t = C v_t$$

Unidentified C in (16) is not realized, so the short vowel syllabifies with the preceding root consonant. A number of morphophonological rules are then required to specify (14) into as many particular rules as are needed to define every attested plural template.

Notice the value of NFORM in metarule (14) is less specific than in any of the external plural rules under (13), except (13a). (Rule [13g] for unintegrated loanwords gives no value at all for NFORM, which is very marked in a Semitic language.) This effectively makes internal pluralization the default option for nominals (again with the exception of those feminine nominals that fall under [13a]).

6.3. Accounting for E/SA verbal inflection in a realizational format

I will limit myself to showing how the 2nd persons singular, masculine and feminine, perfective and imperfective can be dealt with in a realizational format (see Tables 1 and 2).

First, we need two rules to form the perfective (*pf*) and imperfective (*ipf*) stems from the verbal root:

$$(17) X_V, \sigma \{ \text{ASP } pf \} \Rightarrow X \{ a, a \}$$

$$(18) X_V, \sigma \{ \text{ASP } ipf \} \Rightarrow X \{ u \}$$

X is a verbal 3C root such as \sqrt{drs} . By rule (17), applying the perfective value of Aspect to the root amounts to associating it with an /a...a/ vowel melody, hence stem *daras* (also a word-form meaning ‘he studied’). Applying the imperfective value, on the other hand, associates the sole vowel /u/, hence stem /drus/ (not a word-form).

From the perfective stem, we can then form the masculine and feminine 2nd persons singular via partial rule block (19) where X is the output of (17):

(19) Partial RR block for perfective Agreement inflection

$$a. X_{Vpf}, \sigma \{ \text{AGR } \{ \text{PERS } 2, \text{NUM } sg, \text{GDR } masc \} \} \Rightarrow X \oplus ta$$

$$b. X_{Vpf}, \sigma \{ \text{AGR } \{ \text{PERS } 2, \text{NUM } sg, \text{GDR } fem \} \} \Rightarrow X \oplus ti$$

Rule (19a) defines *darasta* ‘you(masc. sg.) studied’, whereas rule (19b) defines *darasti* ‘you(fem. sg.) studied’.

Things are a bit more complex in the imperfective 2nd person, as we need two successive rule blocks, one for person and one for number and gender:

(20) RR block for imperfective 2nd Person inflection

$$a. X_{Vipf}, \sigma \{ \text{AGR } \{ \text{PERS } 2 \} \} \Rightarrow ta \oplus X$$

(21) RR block for imperfective Number-Gender inflection in 2nd Person

$$a. X_{Vipf2}, \sigma \{ \text{AGR } \{ \text{NUM } sg, \text{GDR } masc \} \} \Rightarrow X$$

$$b. X_{Vipf2}, \sigma \{ \text{AGR } \{ \text{NUM } sg, \text{GDR } fem \} \} \Rightarrow X \oplus i$$

$$c. X_{Vipf2}, \sigma \{ \text{AGR } \{ \text{NUM } pl, \text{GDR } masc \} \} \Rightarrow X \oplus u$$

$$d. X_{V_{ipf2}}, \sigma \{AGR \{NUM \textit{pl}, GDR \textit{fem}\}\} \Rightarrow X \oplus an$$

Rule (20a) defines *tadrus*, also a word-form meaning ‘you(masc. sg.) study’ according to (21a). The latter is an identity rule whose output is identical to the input, itself identical to the output of (20a). The other rules need no comment. Each rule defines a cell in the paradigms of Tables 1 and 2.

6.4. Accounting for Nubi plural formation in a realizational format

A full description of Nubi plural forms only requires one rule block including one rule for each device:

(22) Rule block for Nubi plurals

- a. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X \oplus (y)\acute{a}$
- b. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X \oplus \acute{y}ya$
- c. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X \oplus \acute{in}$
- d. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X \oplus \acute{an}$
- e. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X \oplus \acute{n}\acute{a}$
- f. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X \oplus \acute{k}\acute{a}$
- g. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X \oplus \acute{u}$
- h. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X \oplus [\textit{stress}]$
- i. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X_{\textit{suppl}}$
- j. $X_N, \sigma \{NUM \textit{pl}\} \Rightarrow X_{\textit{suppl}} \oplus [\textit{aff}]$

These rules do not take frequency into account. X_N designates a nominal root, a stem and a word-form. Rule (22j) describes those nominals that pluralize incrementally, attaching one of the suffixes of rules (22a-g) to a suppletive root-stem-word. Examples for each of the rules were given in 5.1.

Since the input is the same in all rules, there are no criteria for assigning a particular lexeme to a rule and nothing prevents a lexeme from pluralizing according to more than one rule, as indeed happens: cf. *sokolná*, *sokolín*, and *sokolá*, all meaning ‘things’. As already mentioned, Nubi thus turns out to be more complex than E/SA as far as forming plurals is concerned, even though it involves less rules and simpler ones than does E/SA.

6.5. Accounting for Nubi verbal inflection in a realizational format

As explained in 5.2, there is one clearly affixational inflection for Nubi verbs, namely passive formation as in *kásulu* ‘to wash’ vs. *kasulú* ‘to be washed’. It is straightforwardly described through the following RR:

$$(23) X_V, \sigma \{VOICE \textit{passive}\} \Rightarrow X \oplus [\textit{stress}]$$

Final vowel epenthesis as in *nyákam* ‘to capture’ vs. *nyakamá* ‘to be captured’ seems to be too sporadic to be accounted for by way of rule.

The question now is about bare verb forms interpreted as perfective and the core aspect preverbal markers *gi* and *bi* contributing progressive and imperfective meanings

respectively.¹⁹ Shall we assume a silent marker for the former and analyse *gi V* and *bi V* sequences as syntactic phrases as is common practice in creole grammars? We shall not, as such moves would be at odds with the basic principles of the present study. For bare verb forms I will simply posit an identity rule that returns the same form when a verb root-stem is assigned *pf* as an aspect feature value:

$$(24) X_V, \sigma \{ASPECT\ pf\} \Rightarrow X$$

As for *gi* and *bi*, considering that nothing may intervene between them and the verb they modify, I analyse them as prefixes introduced by the following rules:²⁰

$$(25) X_V, \sigma \{ASPECT\ prog\} \Rightarrow gi \oplus X$$

$$(26) X_V, \sigma \{ASPECT\ ipf\} \Rightarrow bi \oplus X$$

Rules (24)-(26) then build the following paradigm for which I use the feature analysis sketched in footnote 16:

	Perfective	Imperfective
+punctual	V	<i>gi-V</i>
-punctual		<i>bi-V</i>

Table 3: Nubi inflectional paradigm for Aspect

Notice the empty cell related to the fact that (24) is the only rule returning a perfective value, and perfective is redundantly punctual.

Nubi inflection for Aspect therefore turns out to be affixational as well, except that one form draws its value from contrastively showing NO affix, and the two remaining forms show prefixes. If suffixation is considered unmarked owing to its greater cross-linguistic frequency, and paradigms only including suffixed forms are accordingly defined as canonical (Corbett 2007), then the paradigm in Table 3 may aptly be termed “generalized”. I will return to this notion.

Analysing *gi* and *bi* as prefixes of course entails that, should an auxiliary be present, they will attach to it, and it is the sequence prefixed auxiliary-verb that constitutes a syntactic phrase. This is shown in the following example, where the auxiliary is *ja* ‘to come’ and the *gi-ja V* construction refers to an unspecific future (Wellens 2005:165 [425]):

(27) *Gi-ja wája záidi kan ítokum fíku.*
 PROG-come hurt much when 2PL untie
 It will hurt a lot when you untie (it).

The Anterior marker *kan* is a different matter on the other hand (Wellens 2005:156ff.). For one thing, it is an autonomous verb-form, namely the past form of the copula. Probably owing

¹⁹ Given the range of meanings they contribute (Wellens 2005:147ff.) *gi* and *bi* are probably better analysed as imperfective-punctual and imperfective-nonpunctual respectively (see Kihm 1994:86ff. for the similar *na* and *ta* markers of Guinea-Bissau Kriyol). I keep “progressive” and “imperfective” for convenience.

²⁰ Wellens (2005:155-156) mentions that some speakers may combine *bi* and *gi* in a *bi-gi-V* sequence. Such affix concatenations are commonplace in agglutinative languages.

to this property, its position with respect to the verbal complex is relatively free and it can be separated from the verb it modifies, which prevents it from being analysed as a prefix.

7. What happened?

Let us have another look at the rules for E/SA plural formation in (13a-j) and (14), and for aspectual stem selection in (17) and (18). All of them crucially invoke root and template specifications. None of the Nubi rules in (22a-j) and (23)-(26), in contrast, does so, as their output merely consists in concatenating an affix with a segment string that is at the same time a root, a stem, and an effective word-form – or in doing nothing as with the perfective rule in (24).

Comparing both languages in this way reveals what happened: E/SA consonantal roots and templatic stems got lost in Nubi. Nubi roots became syllabic, i.e. sequences of CV(C) syllables in which consonants and vowels are not functionally segregated. Stems, formally undistinguishable from roots, became trivially rather than strongly templatic. By trivial templaticity I am pointing to the fact that natural language simple lexemes – that is putting aside extended derivations and polysyntheticity – always abide by formal constraints, but these constraints are often rather unspecific, bearing on word length (generally limited to three syllables), possible segment strings (nearly always well below what the human vocal tract can accommodate), and so forth. Strong templaticity is revealed by more specific formal constraints such as the ones bearing on Semitic possible roots and templates (see 6.1).

Loss of consonantal roots and strong templaticity entailed the impossibility of internal plural formation and aspectual stem selection, which crucially requires reference to both for the infixational process peculiar to Arabic. Indeed, in order to build an internal plural as formalized in metarule (14), one first needs a three-consonant template which may be extended to four consonants, but in such a way that the fourth consonant is, so to speak, extrametrical: it is there, but it is not counted. Given this, we identify a last consonant C_3 and a penultimate C_2 in the $\langle CCC \rangle$ template. We are then in a position to formulate the unambiguous rule that the intrusive C_v syllable that is the exponent of plurality concatenates to C_2 (and therefore precedes C_3). Likewise, the perfective and imperfective stems consist in two templates, $\langle CaCaC \rangle$ and $\langle CCuC \rangle$, that show the association of two or one vowel with a 3C root.²¹

If the consonantal root and the template's configuration become inaccessible for some reason, internal plurals and inflected stems cannot but turn morphologically opaque – which is why the few of the former that entered Nubi could only be treated as suppletive forms and Nubi verbs receive aspectual values irrespective of the corresponding value of their E/SA etymon (see below).

Plural suffixes remained accessible in principle, in contrast, because suffixation need not look into the root/stem, but it only requires the latter's right margin to be defined, which it always is no matter whether templaticity is strong or trivial. Which suffix goes with which stem became unpredictable, however, owing to loss of reference to specified templates. We will take up this issue again in the next section and try to find out why verbal affixes did not make it into Nubi to the difference of their nominal congeners.

8. Why did it happen the way it did?

²¹ SA also has $\langle CiCiC \rangle$ perfectives and $\langle CCiC \rangle$ and $\langle CCaC \rangle$ imperfectives (Dickins 2007).

The primary cause, I will argue, resides in the very process that gave rise to Nubi, namely unguided SLA by adults (see section 3).

Children acquiring their native language and adults learning an L2 on the job have one thing in common: they are exposed to word-forms, not to roots or stems. They hear – and come to understand – *kelaab* or *yadrus*, not \sqrt{klb} or \sqrt{drs} . They are separated by a crucial difference, however. Children are very good at extracting regularities or, in other terms, at recognizing paradigms (Tomasello 2007). From an acquisition perspective, paradigms are primary, roots-stems are abstracted from them as regularities out of variation. Such a process is essential for L1 acquisition as it allows for generalizations. Once children acquiring L1 Arabic have understood that *šaħn* / *šuħúun* and many other similar pairs are forms of the same lexeme, that they constitute a paradigm, they cannot help perceiving the consonant sequence as a regularity against the background of the changing vowel melody correlated to the number contrast. Awareness of the consonantal root and of strong templaticity go hand in hand (see Berman 2010 on the acquisition of Hebrew).

Adults, in contrast, are rather bad at extracting regularities and recognizing paradigms – perhaps because they lost the ability to do so unconsciously. As a consequence, the enslaved soldiers who initiated Nubi never perceived that e.g. E/SA *šoġl* and *ašġaal* are two forms of the same lexeme, one meaning ‘work’, the other ‘works’. They memorized the singular, perhaps because of greater frequency, changing its sound shape to *sókol* and its meaning to ‘thing’, and they discarded or never found out about the plural.

E/SA external plurals are much more conspicuous than internal plurals, on the other hand, especially as all suffixes bear stress. Even adults could not fail to notice them and that e.g. *farráan* / *farraníin* constitutes a two-cell paradigm. They and the paradigms were accordingly taken into Nubi, entirely reshuffled and generalized, compensating for the loss of internal pluralization.

Here, the crux of the matter is that plural suffixation and internal pluralization are by and large disjoint in E/SA, except for a few unclear cases such as e.g. *šabb* / *šobbáan* (see section 4.1). It is therefore possible to keep (and then generalize) the former while forgetting about the latter. Verbal affixes and alternative verbal stems, in contrast, belong to the very same paradigms. If you don’t recognize *darasna* and *nadrus* as perfective and imperfective forms owing to their stem’s contrasting shapes, you won’t recognize them as 1st person plurals either, because the (cumulative) exponence of these features depends entirely on the aspectual value of the verb-form as retrievable from the stem’s shape. Understanding the forms implies learning the full paradigms, which adults will not do unless they are given formal tuition or time and opportunities. This, I submit, explains the different fates of E/SA nominal and verbal affixation in the transition to Nubi.

In fact, the only SA verbal affix still found in Nubi is *bi-* (cf. 4.2 and 5.2). Not only is such a survival not surprising, but it fully supports the present account. As mentioned in 4.2., SA *bi-* is prefixed to fully inflected imperfective forms to give them values ranging from actual present to future: cf. *bitadrus* ‘you are studying’ or ‘you will study’. This means that *bi-* does not belong to the imperfective paradigm, it just attaches to any form of it with a modicum of phonological fitting (e.g. *badrus* ‘I am / will be studying’). SA *bi-* therefore prefigures Nubi *bi-*, which keeps all its properties except for limiting its meaning to futurity.²² It is its disappearing that would have been surprising!

²² See Wellens 2005:133ff. and 347-348 for a more complete discussion of *bi-*’s semantics in the two dialects of Nubi as well as in Juba Arabic and Turku.

As a matter of fact, most Nubi verbs seem to proceed from the E/SA imperative (Owens 1985): e.g. *akulu* ‘to eat’ < SA *akul* ‘eat!’ – conceivably a frequent form in a military context.²³ A sizeable contingent comes from the perfective, usually the 3rd person masculine singular consisting in the bare stem: e.g. *wága* ‘to fall’ < SA *wagaʃ* ‘he fell’; and a small number from the imperfective or from participles (Wellens 2005:334-335).

The prevalence of originally imperative and perfectives forms – or, more accurately, speech acts – in the primary input is probably one reason why Nubi bare verb forms are interpreted as perfective. Imperatives are indeed perfective in the unmarked case as they refer to the accomplishment of a specific occurrence of an action. True, a number of p/c’s show the same correlation of bareness with perfectivity, so one is tempted to also ascribe it to the later process of expansion and ultimate creolization. It is far from being an all-p/c feature, however: from the eighteen languages described in Holm and Patrick (2007), twelve prompt a “no” or “not always” answer to question 1.3 “Non statives with past reference”.²⁴

Substrate influence cannot be excluded either. Owens (1991:17) points to Mamvu, a Nilo-Saharan language of Sudan, as being the closest to Nubi in having “a single segmental form”. He doesn’t specify the meaning of this form, however. Pending further evidence, therefore, I will continue to assume that the cause for bare perfectivity in Nubi has to be looked for in the BV that realized the transition between the lexifier and the pidgincreole which finally grew into Nubi.

What about passive inflection? Does it represent a survival of E/SA passive? Yes and no. Passivization in E/SA exploits the complex system of verb derivation the dialects inherited from Classical Arabic. Two Forms assume a passive meaning in E/SA:²⁵ Form V obtained by prefixing *it-* to Form II, itself derived from basic Form I by doubling the second root consonant, e.g. *itkassar* ‘it was smashed up’; and Form VII involving *in-* prefixation to the stem, e.g. *inbaliʃ* ‘it was swallowed’ (Owens 2001:354; Dickins 2007). Because of paradigm extinction, none of these Forms left any trace in Nubi, where most if not all verbs come from underived Form I (e.g. *kasar* ‘he broke’) and fossils of other Forms are extremely hard to find.

According to Wellens (2005:353-355), the Nubi passive emerged through the following stages. First there were passively interpreted sentences differing from active sentences only by the fact that no agent was expressed, as in *Bádulu rután* /change language/ ‘X changed the language’, hence ‘The language was changed’, a rare construction in present-day Nubi (Wellens 2005:353; also see Keenan 1985:248). In such constructions, it was an open option to left-dislocate the patient argument, leaving a resumptive pronoun *in situ*: *Rután, bádulu-ú* /language change-it/ ‘The language, it was changed’. The enclitic pronoun *-u* then merged with the root, thereby attracting word stress to the new final syllable and undoing left-dislocation. *Rután badulú* ‘The language was changed’ thus became a full-fledged agentless passive sentence, and *badulú* the passive form of *bádulu*. Final stress was then grammaticalized as the passive voice exponent regardless of the timbre of the final vowel and irrespective of whether it stems from enclitic *-ú*, or is original as in *werí* / *weríí* ‘to show / to

²³ Final /u/ probably comes from the E/SA enclitic 3SG.MASC object pronoun *-u*, so the actual etymon of *akulu* is *akul-u* ‘eat it!’ (Wellens 2005:338).

²⁴ Berbice Dutch, Haitian, Jamaican, Korlai, Ndyuka, Nagamese, Negerhollands, Palenquero, Papiamentu, Seychellois, Tok Pisin, and Zamboangueno.

²⁵ Capitalized “Form” refers to the association of a template with an array of meanings in the derivational paradigm of a given verbal lexeme.

be shown’, or is epenthetic as in *nyákam / nyakamá* ‘to capture / to be captured’ (see above). One last change saw to it that the sole argument of the passive predicate was preferably returned to its original postverbal internal argument position, hence *Badulú rután* ‘(There) was changed the language’.

Although Wellens’s reconstruction is largely speculative, we can accept it as being the most plausible, perhaps the only available one.²⁶ Its deviousness is due to paradigm extinction that left the BV without any passivization device, so the ensuing expanded pidgin had to recreate one from scratch. Also note, a favouring factor for paradigm extinction, the phonetic unobtrusiveness of the E/SA passive exponents *it-* and *in-*.²⁷ What we should marvel at, therefore, is the stubborn insistence of the Nubi creators on finding a dedicated means to express the passive, instead of recruiting the 3rd person plural or giving it up altogether. Perhaps it is here, in such a preexisting “need” for passive expression, that substrate-adstrate influence ought to be looked for, rather than in the grammatical forms themselves. That the formal device had to be morphological rather than syntactic, on the other hand, is probably owing to the fact that the lexifier offers no model for a periphrastic expression as in English.

Returning to nominals we also saw that the disappearance of inflection classes based on templatic properties and gender had the apparently paradoxical effect of rendering the p/c more complex than its lexifier, insofar as the distribution of plural suffixes is no longer rule-governed, but has to be known item by item. Why shouldn’t a p/c be more complex than its lexifier, however? Perhaps that is just a prejudice, borne both from the baby talk, simplification tradition on the one hand, and from the modern notion that p/c’s somehow embody an ideal of language, on the other hand. SLA accounts of p/c formation do not entail such a conclusion in any way.

Phonological changes probably occurring during the unguided SLA phase contributed to the fading of the consonantal root and strong templaticity in addition to adult ineptness for paradigm learning. Final consonant deletion as in *kel* ‘dog’ < E/SA *kalb* destroyed triconsonantal roots. Insertion of paragogic vowels – probably due to interference from L1 phonotactics – resulted in syllabic roots-stems in which consonants and vowels have the same grammatical status: cf. *bele* ‘country’ < E/SA *balad* (root \sqrt{bld}), *ágili* ‘intelligence’ < SA *ʕagl* (root $\sqrt{ʕgl}$), etc. Amalgamation of the definite article or other preposed elements gives more evidence that consonantal roots were no longer recognized: cf. *Íbira* ‘needle’ < SA *al-ʔibra* ‘the needle’, *lukumár* ‘donkey’ < SA *al-ħumáar* ‘the donkey’, *filél* ‘night’ < SA *fi leel* ‘at night’, etc.²⁸ Numerous borrowings from Kordofanian, Nilo-Saharan, then Bantu languages, all with syllabic roots and apparently no strong templaticity, also forwarded the process.

9. Conclusion: the mutual affinities of p/c formation and morphological theories

We assume Nubi to be the end-result of a protracted process of pidgin expansion starting from a BV or post-BV that was itself the result of on-the-job learning of E/SA L2 by adults. Unguided SLA by adults in adverse conditions (forceful recruiting into a foreign army) does

²⁶ Owens (2001:363-364) gives an account of Nubi passive formation that is quite similar to, although less explicit than Wellens’s. According to him, no explanation is likely to come from the substrate-adstrate.

²⁷ E/SA *it-* and *in-* are often buried in the middle of the phonological word: cf. *btindaruban* /b-t-in-darub-an/ /PRES-3F-PASS-V.IPF-F.PL/ ‘are being hit (feminine subject)’ (Owens 2001:354).

²⁸ This is remarkably similar to what happened extensively in French-related creoles: cf. Haitian *lanmen* ‘sea’ < French *la mer* ‘the sea’, *dlo* ‘water’ < French *de l’eau* ‘some water’, etc.

not lend itself to paradigm learning, for it seems to be an averred fact that adults have lost the children's ability to spontaneously organize into paradigms the word-forms they hear and perceive to be related. Like children, adults acquiring a language are first exposed to isolated word-forms; unlike children, they will stay at that stage unless they are given the opportunity for lengthy exposure to the language or formal tuition. The Nubi initiators were given neither, it is even possible they never had access to "full" Arabic, but only to a foreigner's talk variety of it.

Without paradigms, the root-and-template character of the E/SA lexicon could not be teased out of the raw data. The lexicon of the BV therefore consisted in words from which no inner structure could be abstracted. This accounts for why all E/SA internal inflection (internal plurals of nouns, aspectual stems of verbs) disappeared in Nubi. Nominal plural suffixation was retained because spotting the end of the word is all it needs. Verbal affixes, in contrast, went down along with the stem alternations they are linked to.

The preceding account seems true to the facts as we know them. Nubi clearly belongs to that family of Creoles, of which Tok Pisin and Guinea-Bissau Kriyol among others are also members, that developed gradually and reached full expressive power even before they were anyone's native language. Once the Nubis had become real linguistic and ethnic communities in Uganda and Kenya at the beginning of the twentieth century, children acquiring it as an L1 certainly contributed to giving the language its final natural touch as they did in contemporary Tok Pisin (Sankoff & Laberge 1980). But this only came long after the core changes that shaped Nubi in contrast with E/SA had taken place.

Notice now that such an account presupposes that paradigms occupy a central position in the ecology of language. In other words, it presupposes that the morphological component is autonomous and organized along the lines assumed in the so-called "realizational" theories of which Paradigm Function Morphology (PFM) is probably the most accomplished representative so far. To quote Stump (2001:32):

The fundamental insight underlying PFM is that paradigms play a central role in the definition of a language's inflectional morphology [...] In PFM, paradigms are not the epiphenomenon that they are often assumed to be in other theories, but constitute a central principle of morphological organization"

Within such an approach, morphological structure in terms of roots, stems and affixes is not a primitive, but it is abstracted by language acquirers-users from the paradigmatic organization of the lexicon, inasmuch as they perceive it.

Suppose now the opposite set-up: roots, stems and affixes are primitives and paradigms are epiphenomena, as assumed in syntactocentric theories such as DM. We can still understand why internal plurals did not survive the SLA episode, because they are just too complex, for the L2 learner as well as for the linguist attempting to account for them in such a framework. (See the analysis of English irregular plurals of the *foot / feet* type in Halle & Marantz 1993, where the very logic of their system forces them to assume a zero suffix as a trigger of apophony. Zero suffixes are conceivably the hardest thing to master for L2 learners!) We do not understand, however, why nominal suffixes did survive, whereas verbal affixes went down the drain. Only by taking paradigmatic organization into account can we reach a principled explanation for such opposite outcomes.

It seems to me, therefore, I have fulfilled my contract in showing that the morphological streamlining of p/c's cannot be taken as merely a historical accident or a return to an ideal shape of language. It carries very specific lessons that may help us to choose the best theory concerning both p/c formation and the organization of the morphological component. I am confident it can even tell us a lot about the real status and function of morphology in natural language. That is matter for further work, however.

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