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MAHER AWAD

The main hypothesis of this paper is that nominal agreement in Standard Arabic (SA) is semantically based. In the course of arguing in support of this claim, the following two sub-hypotheses will emerge and be supported: (1) adjective modifiers of human nouns (i.e., nouns referring to human beings) encode both gender and number in both their singular and plural forms, while adjective modifiers of non-human nouns (both animate and inanimate) encode both gender and number in the singular, but only number in the plural. (2) Numeral modifiers (specifically, cardinal numbers) of plural nouns betray a complex and conscious process of lexical decomposition.

By saying that nominal agreement is semantically based, we mean that this agreement is grounded in and is triggered by the meaning of the noun – its semantic properties, that this agreement is not a mere phonological or morphosyntactic formality. By encoding we mean morphological encoding in the form of markers that are semantically motivated. Those morphological markers may be overt or may be -Ø. Finally, by nominal we mean phrases of the following types: 'boys'; 'nice boys'; 'three nice boys', with 'three' being the numeral modifier and 'nice' the adjective modifier.

SA is known to be an example of languages that have agreement in gender and number. Every noun in its singular form is either masculine or feminine; and it is assumed that the noun is the category which triggers the agreement between it and its modifiers. SA shows agreement in grammatical case as well. This last category, however, will not bear directly on our discussion in this paper; and to eliminate it from our examples below, so as to simplify our marking system and to focus instead on only gender and number, our examples will be presented in their 'pause form', a tactic used in SA to divorce grammatical case from words. To illustrate how nouns and their modifiers show agreement in gender and number let us take the following set of noun-adjective phrases: (M = masculine; F = feminine; Sg = singular; Pl = plural)

- (1) mudarris ʃahīr
teacher-M/Sg famous-M/Sg
'a famous teacher (M)'
- (2) mudarrisa ʃahīra
teacher-F/Sg famous-F/Sg
'a famous teacher (F)'

In (1) the masculine forms of the noun and of the adjective are unmarked (-Ø), while in (2) both these forms are marked with -a. This -a suffix is commonly used in SA to derive feminine human nouns from masculine human nouns, as in the above. This fact, coupled with the fact that most feminine non-human nouns end with this suffix (-a) has led Arabists to call it the feminine marker, or the Feminine -a. On the face of it, the suffix -a

*The original ideas in this paper emerged from conversations with Emanuel Barshi, Arnold Zwicky and, especially, Zygmunt Frajzyngier commented generously on an earlier draft. Had I incorporated more of their advice this paper would have been significantly improved. Any remaining errors are mine alone.

on *jahiira* seems to display a simple morpho-phonological copying of the same suffix as that on the noun *mudarrisa*. The following example, however, shows that this is not so:

- (3) bint jahiira
girl-Sg famous-F/Sg
'a famous girl'

(In SA natural gender coincides with the gender of the noun; thus, there is no need to mark *bint* as feminine.) In the example above, the suffix *-a* is retained on the adjective despite the fact that it does not materialize on the noun. Nor is this phenomenon restricted to human nouns:

- (4) nafs saadiqa
soul-F/Sg truthful-F/Sg
'an honest soul'

Again, *-a* shows up on the adjective, thereby rendering it feminine, when *-a* is absent from the noun. The common denominator, however, is that *-a* on the adjective modifying a singular noun will transform that adjective to the feminine gender. This phenomenon clearly shows that this type of agreement is not a mere morpho-phonological copying; rather, the adjectives in the previous examples agree with their accompanying nouns on the basis of the lexical properties of those nouns. One of the semantic features that *mudarrisa*, *bint*, and *nafs* share is the feature Feminine. It is this semantic feature that triggers the presence of the Feminine *-a* on the modifying adjectives.

To show further that nominal agreement is semantically based, let us examine the following set:

- (5) xaliifa ʕaḏiim
caliph great-M/Sg
'a great caliph'
- (6) maqaala ʕaḏiima
article-F/Sg great-F/Sg
'a great article'

The triconsonantal root from which *xaliifa* is derived is *xf*. *xf* has the meaning 'succeeded' (as in a lineage), from which the noun *xaliif* 'successor (M)' is derived. The final *-a* is then added to derive a feminine noun. Nowadays, if we want to refer to a female successor (to a throne, for example), we would use the noun *xaliifa*, to a male successor we would use *xaliif*. But if we do this, we do not refer to a female or male caliph, but rather to a female or male successor. (In the history of the Arabs there never was an instance of a female caliph.) The important point to be observed here is that the suffix *-a* on *xaliifa* is indeed the feminine suffix about which we have been talking all along, but the noun *xaliifa* refers to a male human and, therefore, the modifying adjective *ʕaḏiim* in (5) reflects this fact by being marked for the masculine, i.e., $-\emptyset$, while the same Feminine *-a* on *ʕaḏiima* in (6) reflects the fact that the adjective 'great' now refers to 'article', which is feminine.

Our examples thus far have been of singular nouns only. Let us now observe how plural nouns behave:

- (7) mudarrisuun jahiiruun
teacher-M/Pl famous-M/Pl
'famous teachers (M)'

- (8) mudarrisaat jahiiraat
teacher-F/Pl famous-F/Pl
'famous teachers (F)'

The suffix *-aat* encodes both gender and number at the same time, while *-uun* encodes, in addition to these, the nominative case. This last, as we have previously said, is of no direct bearing on our present discussion, except that it will serve here to illustrate an interesting point. Although from a syntactic point of view (9) is ungrammatical, because *-iin* -- the masculine plural accusative suffix -- does not agree in grammatical case with *-uun*,

- (9) *mudarrisuun jahiiriin,
teacher-M/Pl famous-M/Pl
NOM ACC

from a semantic viewpoint *-uun* and *-iin* agree in both gender and number. The above ungrammatical construction, unlike (10), is one that can conceivably be uttered or written by a speaker not very well-versed in SA's prescriptive rules of grammar:

- (10) *mudarrisuun jahiiraat
teacher-M/Pl famous-F/Pl
NOM NOM/ACC/GEN

The suffix *-aat* in (10) is the 'pause form' of both *-aatun* (nominative case) and *-aatin* (accusative and genitive cases). This suggests that (9) is more plausible an error than (10) not because *-uun* and *-iin* in (9) differ on fewer agreement categories (i.e., gender, number, case) than do *-uun* and *-aat* in (10), for this is simply not the case: they do not differ on the quantity of categories but on the quality of these categories. This suggests that perhaps some of those categories, i.e., gender, number, or both have more primacy (in some sense) than case, and, by extension, that semantic properties of nouns in SA are more basic than their syntactic associations.

All the nouns we have thus far presented have been singular human, plural human, or singular non-human. In each example, the adjective has agreed both in gender and in number with its noun. Now we will turn to the plural non-human nouns to present evidence to support the second clause of our first sub-hypothesis, that adjective modifiers of non-human nouns (both animate and inanimate) encode both gender and number in the singular, but only number in the plural.

In an earlier example we used the noun *maqaala* 'article (F/Sg)'. This noun terminates in the feminine suffix *-a*, our best clue to the (unnatural) nature of its gender. *maqaala* is actually derived from *maqaal* 'article (M/Sg)'. Both nouns are frequently used in SA and, aside from the fact that one is feminine and the other masculine, with no apparent difference in meaning (other than *perhaps* to *some* speakers *maqaala* denotes a shorter article than *maqaal*). Modifying these two singular nouns betrays no unexpected behavior:

- (11) maqaal tawiil
article-M/Sg long-M/Sg
'a long article'
- (12) maqaala tawiila
article-F/Sg long-F/Sg
'a long article'

Both phrases illustrate a smooth, harmonious concord. In the plural, however, this harmony turns out to be illusory:

- (13) maqaalaat tawiila
 article Pl long
 'long articles'

(13) is the plural of both (11) and (12). Several issues are raised by (13). First, the suffix *-aat* on *maqaalaat* is apparently the same suffix that appeared earlier on *mudarrisaat*, but in *mudarrisaat* it served to derive a feminine plural noun from a feminine singular noun ending with *-a*. This presents no irregularities for *maqaala*, which is a feminine singular noun terminating in *-a*. But *maqaal*, which is neither feminine nor ending with *-a*, is difficult to explain. Secondly, now that we have the plural *maqaalaat* at our disposal we cannot predict, or otherwise know, whether it is the plural of *maqaal* or *maqaala*. Thirdly, in *mudarrisaat sahiiraat* the feminine plural suffix *-aat* was encoded onto both the noun and the adjective; in (13) this encoding is absent from the adjective. Finally, and most importantly for our purposes, the adjective marker here is *-a*, apparently the same marker as the feminine singular. How comes it that in (13) the adjective modifying an *apparently* feminine plural noun is feminine singular? It is this last question that the few following paragraphs will attempt to answer.

Before proceeding any further, however, a note is in order. The progression of the bigger part of the remainder of this paper will address the second clause of the first sub-hypothesis; and this will require us, for reasons that will become clear soon, to differentiate between the adjective which is used with feminine singular nouns (as in 2, 3, 4, 6, 12), on the one hand, and the adjective used with non-human plural nouns (as in 13), on the other. For convenience of reference we shall call the former Adj1, the latter Adj2.

The questions raised by (13) in the preceding paragraph are not unique to the last few examples. Some of those questions, and sometimes all of them, are raised for thousands of other phrases. The following is just a sample:

- (14) maṭaar kabiir
 airport-M/Sg big-M/Sg
 'a big airport'
- (15) sayyaara kabiira
 car-F/Sg big-F/Sg
 'a big car'
- (16) maṭaaraat kabiira
 airport-Pl big
 'big airports'
- (17) sayyaaraat kabiira
 car-Pl big
 'big cars'

Here, masculine and feminine singular nouns are made plural by the same device: the suffix *-aat*. (There are other ways of pluralizing singular nouns, e.g., by an internal vowel change, otherwise known as 'broken plurals'.) However, it is always the case (to my knowledge, without exception) in SA that an adjective modifying a plural non-human noun

has exactly the same form as that which is used to modify a feminine singular noun, both human and non-human, as some of the examples cited thus far clearly attest.

To emerge from the dilemma that the earlier questions present, I would like to suggest a re-examination of the nature of Adj1 and Adj2. Although these two adjectives are identical in form, they do not seem to be identical in their semantic function. The question is basically this: why is the adjective that modifies a feminine singular noun (Adj1) always exactly identical in form to the adjective that modifies a plural non-human noun (Adj2), regardless of whether this last noun was masculine or feminine in the singular?

First, it cannot be said that Adj2 agrees either phonologically or morpho-syntactically with its plural noun. The examples throughout this paper refute any such claim. Further, to look for the answer outside of semantics would not, in my opinion, be fruitful for two reasons. The first is that we have seen how semantics has provided us with adequate grounds for the agreement in gender and in number in the singular and plural human, and the singular non-human nouns; why should the plural non-human be an exception? Secondly, the adjective modifying a plural non-human noun is always constant: the same form which modifies the feminine singular. What secret lies in the plural form of a noun that "makes it" feminine when in the singular it was either masculine or feminine? What secret morphemes does the plural have with which the constant adjective must agree? Clearly, none. Regardless of the morphemes that compose the plural nouns, and regardless of the gender of these nouns in their singular forms, their modifying adjectives are always constant, i.e., they have the same forms as Adj1. Adj2, then, must have an entirely different semantic function from Adj1; namely, it encodes the plural number only and does not encode gender. The gender, in other words, is neutralized in the plural, for as we have argued, and as will become clearer soon, there is nothing in the plural *per se* that makes it feminine thus warranting the use of Adj1. Besides, if we use Adj1 on the merit of its Feminine property, we run into the obvious problem of number, for Adj1 is not only feminine but also singular and thus cannot be used with a plural noun.

The stronger evidence for my claims that Adj1 and Adj2 are different in their semantic function, that Adj2 encodes only number, and *especially* that it does not encode gender, comes from numeral modifiers, whose invocation here will serve the dual purpose of bringing more evidence to bear on our claim above, and at the same time lead us to the second, and last, sub-hypothesis. Let us run head-on with the problem by taking the following examples:

- (18) ṭalaaṭ nufuus saadiqa
 three-M soul-Pl truthful
 'three honest souls'
- (19) ṭalaaṭ sayyaaraat kabiira
 three-M car-Pl big
 'three big cars'
- (20) ṭalaaṭat maṭaaraat kabiira
 three-F airport-Pl big
 'three big airports'

In the above set of examples we note the presence of Adj2. The nouns are all plural, the first one a 'broken plural'. The numeral 'three' has the unmarked masculine form *ṭalaaṭ*, the feminine the marked *ṭalaaṭat*. As was previously mentioned, the singular *sayyaara* is feminine, the singular *maṭaar* masculine, and the singular *nafs* feminine. In SA

There exists a rule that says that the numeral modifier must have the opposite gender of the singular form of the plural noun it modifies. Thus, the feminine nouns *sayyaara* and *maqaalaat* take the masculine form of the numeral, the masculine *maqaar* the feminine form of the numeral -- a clear case of reverse gender agreement (or disagreement). But while this numeral modifier must show gender agreement, the adjective modifier remains always constant, regardless of the noun's gender. I suspect that this gender neutralization happens precisely because the adjective here has no information about the gender of its noun: it cannot tell whether *maqaaraat* and *sayyaaraat* are masculine or feminine. This is not surprising, since these nouns are made plural by the same morphological device, *-aat*. A similar thing can be said of the numeral modifier: it also is blind to the gender of the plural noun it modifies -- remember, it has to agree with the gender of the *singular* of the plural noun it modifies. Now observe the following examples:

(21) ʔalaaθ maqaalaat tawiila
three-M articles long
'three long articles'

(22) ʔalaaθat maqaalaat tawiila
three-F articles long
'three long articles'

The nouns *maqaalaat* in (21) and (22) are identical. There is absolutely nothing in them to clue us into the nature of their gender. All we know about them is that they are the plural form because of the suffix *-aat*, and their identical adjectives (Adj 2) reflect this fact by the mere fact of their (the adjectives') identity. However, *maqaalaat* in (21) is the plural of *maqaala*, in (22) *maqaalaat* is the plural of *maqaal*. This we know from the gender of the accompanying numerals. Without the presence of these numerals we would have no information about the gender of the singular forms of *maqaalaat* in either (21) or (22).

But what of the numeral? To choose the appropriate form of the numeral, we have to convert the plural noun into its singular, determine its gender, choose the converse gender of the singular, and then use it with the plural noun. This, I claim, is a highly complex and conscious process of lexical decomposition, viz., decomposing the plural noun into its singular form, then determining its proper gender. (21) and (22) refute any claim whose purpose is to assert the automaticity of this process, for one must know first which of the two singular nouns that *maqaalaat* is the plural of before the appropriate numeral can be determined.

To recapitulate, we have seen how the numeral modifier agrees with the noun it modifies: it agrees, of course, in number, i.e., with a quantity of three or more, and it agrees in gender (by a complex, and maybe artificial, process of reverse agreement). However, the adjective (Adj2) defies any agreement in gender as it stays constant regardless of the gender of the plural noun's singular. A clear implication of the latter part of this paper is that the neutralization of gender in Adj2 is the direct reflection of the gender neutralization in plural non-human nouns themselves. Adj2, it was claimed, encodes number, and it is claimed that this agreement is semantic because Adj2 remains constant with plural non-human nouns, regardless of the noun's morpho-phonological makeup. This reason has led us to postulate that Adj1 and Adj2, though identical in form, are different in their semantic content and, thus, function.

ONSET-RHYME TEMPORAL STRUCTURE OF MANDARIN SYLLABLES

ALAN BELL AND MEICHUN LIU*

Introduction. This is a preliminary report on some timing relationships of Mandarin Chinese syllables. It was originally stimulated by an assertion by Ou Yan (1980) that the rhyme of Chinese syllables did not vary in duration when various segmental factors were changed, particularly when a final nasal was added to a syllable, or if diphthongal rhymes were compared to monophthongal ones¹. Because Chinese is a tone language in which most syllables are pronounced with one of four tones, and because the tones have traditionally been associated with rhymes of syllables, the hypothesis has a certain plausibility, for example, if it were the consequence of inherent duration of each tone imposing itself upon the articulatory program of rhyme components. Although there have been numerous studies of Mandarin Chinese duration, none have addressed this issue with data of sufficient scope and quality. Our goal was to examine the durational interaction of combining different onsets, nuclei, and codas in Mandarin Chinese under comparable conditions. We did not consider phrase-positional effects, and considered the effects of different tones only to a limited extent.

What follows is a slightly expanded and revised version of a paper presented at the meeting of the Acoustical Society of America at State College, Pennsylvania on May 23, 1990. It is based on data from four speakers at a normal rate of speech. The full data set, which we are continuing to analyze, consists of data from six speakers at normal and fast rates of speech. The present partial data is nevertheless sufficient to reveal a general picture and some details of the internal temporal relationships among the components of the Mandarin syllable.

Let us first quickly review the structure of Mandarin syllables. Since there are no consonant clusters in Mandarin, onsets are all simple consonants, except for affricates. There are four simple vowels, but a wealth of diverse diphthongs. The only consonants that can close a syllable are the nasals *n* and *ŋ*. Except for the so-called neutral syllables, a syllable is pronounced with one of four tones.

The Data. Our data was collected and analyzed in the following way. Each experiment is based on a small number of syllables, all of which were real words. While Chinese speakers are perfectly able to pronounce combinations of tones and segments that are possible syllables but not actual words -- by changing the tone of a real word, for example -- we found in pilot experiments that speakers often hesitated before some items of this sort (or even before words that were somewhat unfamiliar), upsetting the smooth rhythm of their chosen speech tempo. The words for each experiment were arranged in nine randomly ordered lists. Except for Experiment 3, the lists were divided in half. Two dummy syllables were added to the beginning and the end of each list or half-list. (In Experiment 4, dummy syllables were also added between each target word to break up the repetition of syllables beginning with *t*.) The speakers thus read one list or half-list at a time, each consisting of words written in Chinese characters.

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