The Linguistic Representation of Arabic Morphology

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There has been a very strong tendency in linguistic analyses of Arabic morphology to overemphasize the role of root and pattern morphology and to underemphasize or ignore affixal morphology, as well as a tendency to represent morphology in processive, phonological terms. This article presents a critique of recent linguistic analyses within a cultural studies framework in order to clarify the limitations as well as the insights of previous linguistic analyses of Arabic and proposes an alternative representation which takes into account the variety of morphological relations in Arabic within a nonprocessive framework.

The Linguistic Representation of Arabic Morphology

Semitic root and pattern morphology, especially as exemplified in Classical Arabic, has been a favorite subject of modern linguists and is often referred to in general morphological studies. In recent years it has attracted a great deal of attention due to the central role it played in the development of autosegmental phonology and morphology, especially through the work of John McCarthy. These latter studies have contributed greatly to our ability to represent these processes in a clear and precise manner and, among other things, have aided cross-linguistic comparisons of these processes. There is a tendency, however, in these and other, more general linguistic analyses in which reference is made to Arabic morphology to exaggerate the degree to which Arabic morphology is dependent on root and pattern morphology and to disregard more familiar concatenative processes such as affixation, as well as a strong tendency for processive, phonologically-based representations. Using a framework based on notions taken from the field of cultural studies I will examine the representational strategies used by modern linguists in their fashioning an image of Arabic morphology which is determined more by the demands and interests of their generic practices and less by linguistic "realities."

The present study is part of a larger ongoing project in which I am examining the Arabic language as a cultural construct East and West, both in the Arab-Islamic context as well as in the context of Western or modernist conceptions of language. Table 1 gives a very general sketch of this approach: I examine the works of authors who have written on the topic of Arabic as "specific practices" or instantiations of a more general practice—a "genre" or discourse of writing which treats a topic in a particular way using particular methods or topoi according to the demands of a discipline or the expectations of an audience. I view these "generic practices" as similar in many respects to literary genres of writing or even cinematic traditions of representation (i.e. film genres). As such they are themselves a reflection of much larger and usually inchoate systems of cultural expectations or ideologies, to which I have applied Pierre Bourdieu's term *habitus*, although in Bourdieu's conception *habitus* covers both the domains of cultural expectations/ideology as well as "generic expectations."

**Table 1: Representations**

<table>
<thead>
<tr>
<th>World</th>
<th>Mediating Representations</th>
<th>Human Consciousness</th>
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<tr>
<td>&quot;Reality&quot;</td>
<td>Habitus</td>
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<tr>
<td>&quot;Disposition to action,&quot; an ideological perspective, cultural expectations</td>
<td>Conventions for organizing discourse, (i.e., how to talk about a particular topic to a particular audience)</td>
<td>A specific work by a specific author, a specific context</td>
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Generic practices which deal with Arabic morphology within the Arab tradition include language specialist discourses such as the traditional grammarians' field of *şarf*, including both inflectional as well as derivational morphology, both of which make use of the notion of "*wazn*" (the "weight" or pattern of a word), Ibn Jinni's specialized notion of the "greater derivation" (*al-iştiqāq al-kabīr*), as well as traditional poetic discourses which make crucial use of morphological notions, including *ʿarūḍ* (prosody) and *jinās* (paronomasia). There are also in the Arabic tradition what may be termed nonspecialist discourses which reference morphological notions, including mystical linguistic approaches to exegesis (such as those of Ibn Arabi), "letter magic" (or "*zāhirajah") as described in Ibn Khaldun's *al-Muqaddima*, the tradition of "*zahr*" (or artificial *jinās*) in Egyptian colloquial ballads, as well
as a myriad of word games and punning styles in both the literary tradition and in the many local colloquial traditions. Western discourse which makes reference to Arabic morphology is almost totally restricted to academic specialists, whom I separate into those whose fields of expertise are non-linguistic (Islam, history, culture studies, anthropology, sociology, etc.) but in which knowledge of the language is a necessity, versus those whose fields specifically deal with language (linguistics, traditional grammar, language pedagogy, etc.).

Out of this great variety of discourses or “generic practices” (each of which may overlap with and blend into the others) I have chosen to focus on language specialists within the modernist, linguistic tradition. The list of linguistic works I have chosen to focus on is not exhaustive, but for many of them their influence has been great. From these works I have culled a series of topoi or commonplaces about which the works are organized, indicating in a general fashion the main aspects of their generic practice, viz. how linguists write about Arabic morphology.

The processes involved in these practices have a basis in general cognitive processes, which are reinforced by social and cultural systems of belief and may be found to a greater or lesser extent in almost any attempt at representation, including the one I am pursuing here. When we evaluate actual entities, events, and data, we go through the process of analyzing them, leaving out certain details, highlighting others, perhaps adding some that are not there (but “should be” as “predicted” by our methodology), etc. In a sense our evaluation or analysis of an event is a reconstruction of it, containing what we take to be facts, along with frameworks for understanding those facts (the cultural expectations regarding such events) which may contain some augmentative “fictive” elements and procedures for giving weight or salience to certain other elements. These processes may be summarized as follows: there are two abbreviative cognitive processes which I term distillation and telescoping: Distillation is a process by which the viewer (or writer, representer, etc.) focuses on and extracts only a handful of events, entities, or data upon which to concentrate, leaving out those features of the object which are felt to be uninteresting according to the standards of the discourse. The flip side of this is the process of telescoping which is a process of generalization, of relating different events or entities by seeing them as being the same thing in some way—tokens of the same type, or (in fiction) merging the representation of several real individuals into a single fictional character. Opposite these kinds of abbreviative processes there are two general additive processes: The first, magnification, is the logical next step in the process of distillation and refers to the process whereby a relatively minor feature of an event, entity, or data is enlarged out
of all proportion to what may be its actual role in the event, entity, or data. The second additive process I term enhancement, and it involves adding extraneous and even fictive details to "fill out" the representation and make it more interesting and compelling to the viewer. Each of these four processes (distillation, telescoping, magnification, and enhancement) is used in such a way as to make the representation of an event, entity, or data more salient and attractive to the intended audience, which in turn evaluates the representation in the many different ways it has been trained to evaluate it, according to the prevailing standards of the particular discourse, field, or generic practice. Note that the very practice that I am involved with in this critique involves the same notions as those outlined above, and may itself be examined and critiqued on the basis of what I have left out, left in, magnified, or enhanced.

Let me be the first to critique my own analysis by noting that I have "distilled" only a certain number and type of linguistic analysis from the many that have been published on Arabic morphology in the past fifty years or so. I have focused in on a particular kind of theory-oriented analysis in which the ultimate goal is not an accurate and well-rounded presentation of language specific data, but involves rather a very selective sampling of data which is determined in advance by the theoretical framework. My survey as well is limited in what it includes, and it has a certain framework (or "narrative") into which I have fit these works, and the limitations of my framework should be taken into account in evaluating what I present here. I think that the authors and works discussed here have had such a significant impact on linguistic notions about Arabic that they are a good sample of a certain kind of linguistic practice which has widespread appeal. Many of the other works which have not been included here (including the very well-rounded study contained in Ratcliffe [1998]) will, I hope, be included in future surveys of the literature. The alternative methodology sketched at the end of the article may as well be critiqued on the same basis, although it is hoped that it will avoid some of the pitfalls of current linguistic practice.

Table 2 represents the application of this approach to the field of linguistic studies of Arabic morphology and the numbers in the following discussion make reference to the placement of these terms in the table. The first step, distillation (1), involves an initial focusing in on a fact or a range of facts in the object of study, selecting out what is important or interesting to the discourse or generic practice—in the case of morphology (1a), this is the study of words, word formation, and lexical relations in general. The focus is further delimited by the specific methodology (1b) used in carrying out the analysis—from the comparative method (Comparative Semitic), to structuralism, generative phonology, autosegmental phonology, and optimality
theory. As noted in the nomenclature, many of these methodologies give great value to *phonological representations* over purely morphological ones—phonological processes in general being more "processive, generative, automatic, generalizable," etc.—traits which are highly valued in a tradition of theoretical linguistics which is dominated by syntax and phonology (two very "processive" aspects of language). When these methodologies are applied to Arabic a further focusing occurs (often but not always): there is often an "*estrangement*" of Arabic (1c), whereby Arabic morphology (involving roots and patterns) is contrasted with the morphology of another language (often a European but not always), so that the root and pattern system stands out in relief. That becomes the only focus of the analysis (what is left in), while aspects of the morphology which do not fit that criterion are omitted.

**Table 2: Some Generic Practices of Linguistic Writings on Arabic Morphology**

| 1. Distilling: Focus | a. Morphology: study of words, word formation, lexical relations  
|                       | b. Methodology: comparative, structuralist, generativist, autosegmental  
|                       | c. Estrangement of Arabic: exclusive focus on root and pattern  
| 2. Telescoping        | root and pattern generalized as *the* base for Arabic word formation  
| 3. Distilling: Omission | what is left out due to methodological interest or sources used  
| 4. Enhancing          | details from other languages, manipulations of Arabic data  
| 5. Magnifying         | Arabic as a whole characterized metonymically based on selected features  
| 6. Discursive Positioning | a. Relative to Arab-Islamic tradition: carrying it on versus moving it aside  
|                         | b. Relative to historical linguistics: "historical motivation"  
|                         | c. Relative to prior linguistic analyses  

The second aspect of the representational process is that of *telescoping* (2), which in the case of Arabic morphology is the process whereby the
initial focus of the analysis (viz., root and pattern morphology) is generalized throughout the language by privileging it above all other processes and viewing the consonantal root as the base or source for the formation of all paradigmatically derived words in the language. Exceptions to taking the root as the base of Arabic word formation processes occur, but when they do they very often generalize another single base as the source of all of these processes (e.g., the perfect verb or the imperfect verb stem).

Other aspects of the representational process are apparent in the manner in which the linguistic data is handled in the analysis. The omission of data (3) which contradicts the methodologically preferred outcome is part of the distillation process and includes what is taken as the source of the data, which is crucial in determining the ultimate representation (e.g., uncritically using an Arabic–English dictionary as a source for broken plurals) since a particular source may by its very nature not present a complete picture of the phenomenon in question. These facts about Arabic may then be enhanced (4) with details from other languages, reinterpretations or manipulations of data from the language in question, in order to fill out the analysis, completing the generalization by relating it to universal principles of language structure. The result of these previous steps is the magnification of these facts (5) such that what may be one of a number of processes or facts about a language (perhaps even a relatively minor aspect of the language) is enlarged out of all proportion to its actual role in the language. At times this is taken to the level of metonymizing that aspect of the language to the whole of the language: a part of the language (its homophonous antonyms or certain broken plural patterns) is taken as standing in for or representing the language as a whole, and Arabic as a whole therefore becomes “ambiguous” or “iambic.”

Finally, an important aspect of any analysis is how the authors position themselves relative to the various discourses which have treated Arabic morphology (6), to anchor it in a particular time and place, and to set its discursive identity vis-à-vis other discursive practices. This may involve referencing the Arab grammatical tradition (6a), either positively or negatively, to show that the analysis either carries on aspects of that tradition or else is making up for deficiencies in it. It may also reference historical linguistic analyses (6b) and include references to comparative Semitic data even in purely synchronic analyses, or make explicit its relation to (or difference from) other modernist linguistic analyses of the same data (6c), even those using methodologies of a very different nature. I will also consider as related to this point how these analyses themselves are passed on into the discursive tradition (6d), how they themselves may “become generic,” influencing
generic expectations in the intended audience and thereby feed into later analyses, influencing what others see as interesting or important in Arabic. All of these practices are summarized in Table 2, and I will structure my comments in what follows according to this table.

By way of introduction, I would first like to examine briefly three authors who have dealt with Arabic morphology to clarify how divergent their views are. The first of these is the only author cited here who stands outside of the modernist linguistic tradition, viz., Louis Massignon, the great French Orientalist of the first half of the twentieth century. The second is the only Comparative Semiticist, namely Carl Brockelmann, still considered by many to be one of the greatest Semiticists. And the third is Stephen Anderson, a well-known and widely read phonologist and morphologist.

Massignon (1954) authored the inaugural essay in the inaugural volume of the French journal *Arabica*, and perhaps because of the title of the journal (or perhaps because he was asked to do so) he focused in the article on what he found most interesting in Arabic, namely Arabic morphology. Because of his own specialty (Islamic mysticism) those aspects of Arabic morphology that he chooses to focus on are seen through the prism of Sufism and mysticism, which are then magnified and made salient out of all proportion to their actual place in the language or even the culture as a whole. In other words, he finds in each of these areas things that reinforce his view of the culture and language and he therefore makes them salient, ignoring other more common aspects of the language. The salience of these features is further heightened by the manner in which Arabic is estranged from European languages, by contrasting the “primitive” Semitic structures to “civilized” Hellenistic ones. These contrasts are drawn not for the purpose of denigrating the former but rather to valorize it in its primitiveness. As he states at the end of the article, the “raison d’être of a language lies in its difficulty”—or in other words, its strangeness, uniqueness, and (for Arabic and Semitic languages) its primitiveness (in the sense of being “close to the source”).

He focuses in on four aspects of the culture of the Arabic language, of which three are relevant to this analysis:¹ orthography, triliteral roots, and case vowels. In each of the three areas he focuses in on and magnifies an aspect of the language which is (in terms of actual numbers and value to the native linguistic tradition) peripheral to the language itself, although it may have been central to certain practices (or “genres”) within the Arab-Islamic culture as a whole. In discussing Arabic orthography he focuses in on the

¹ The fourth point, *tadmin*, or the semantic inversion of a concept is not clarified or exemplified very well in the article, since it is a rather complex area of rhetoric, and much of what is attributed to it could be applied to other languages as well.
circle of consonants used by ṭattāṭin “calligraphers” to teach writing or calligraphy in Quranic schools, which represents for him a “topic of the unconscious imagination with a primitive ingenuity.” He then relates it to other mystical discourses within the Arab-Islamic tradition, including the magical interpretation of Arabic letters, and to the Shiite theory of al-Muğira (a gnostic doctrine “in which God was described in human shape with members in the number and form of the letters of the Arabic alphabet,” among other things). In dealing with triliteral roots (which he terms “the etymological triliteralism of roots,” indicating that he takes the root as the base of word derivation) he focuses in on the “semantic value” of roots, and finds it realized in its clearest form in the ʿaddād or “homophonic antonyms” which he calls the “fundamental terms of the Arabic culture.” In one of the clearest examples of metonymizing in the literature reviewed here, Arabic becomes for Massignon not “luğat al-ḍād” (a traditional appellation for Arabic: “the language of the letter ḍād,” which was thought to be a unique feature of old Arabic) but “luğat al-ʿaddād” (“the language of homophonous antonyms”), the ultimate in mystical languages. By having the features of the ʿaddād represent Arabic as a whole he is drawing out even further a contrast between Arabic (as an exemplar of the “primitive,” which has a positive connotation of being close to the source of things) and European languages (as exemplars of the “civilized”).

The third focal point of Massignon’s article deals with ʿīrāb or case vowels (“desinential vocalic triples”). While this is perhaps one of the most important and highly valued features of Arabic within the Arabic linguistic tradition, the aspect which Massignon chooses to focus on and magnify is the mystical reinterpretation and extension of it whereby the three vowels of ʿīrāb (for nouns, verbs, and “mute discourse”) are understood as that which gives “life” to a discourse, with each of the vowels being related to a participant in the discourse (I, you, he), which is then related to “theopatic locution” (or being in discourse with God) as exemplified in Ibn Arabi’s cosmology. In each of these areas, but especially in the latter, Massignon omits any mention of the one discourse within the Arab-Islamic tradition which does deal with these matters, viz., Arabic grammar, the vast majority of whose practitioners, far from valorizing ambiguity and mystical interpretation, tended the other way.

While the article is full of interesting references and some insight, Massignon’s constant comparisons between civilized European languages and primitive Semitic ones (despite the positive connotation of the term primitive) and the mystical skew of his representation connection have

limited its influence on succeeding generations, especially linguists. But it is interesting to note the similarities in the general approach which is shared even by recent works in linguistics dealing with Arabic morphology.

Like Massignon, Carl Brockelmann might be called an Orientalist and an Arabist, but unlike Massignon he was also a comparative Semiticist, one who specialized in comparative grammar and modern linguistics. In his study of the comparative grammar of Semitic languages (Brockelmann 1908), he views the root and pattern in a very narrow fashion:

The root is only an abstraction which nevertheless renders good service by arranging vocabulary in a systematic fashion, like the traditional orders of the alphabet. But just as this [alphabetical] order is not only impractical for scientific phonetics but would be an obstacle for it, it is likewise the case that [the concept of the root] is unusable for morphology. [Morphology] must rather start from forms of words which have lead a real existence. The analysis of the means of expression leads us finally to certain fundamental simple forms that we call bases. . . . It is the same in Semitic: perhaps these bases are altogether older than the categories of noun and verb. (Brockelmann 1908:286–287, quoted in Cantineau 1950:119)

Brockelmann therefore de-emphasizes the role of the root (and pattern as well) in his historical analysis of Semitic, preferring to concentrate on "bases" which exist as independent words. According to Troupeau (1984), he may have been responding to the view of Ernest Renan, another well-known nineteenth century French Orientalist, who tended to overextend and emphasize the notion of "root" in Semitic.

In contrast to this view is that of Stephen Anderson, a present-day linguist specializing in theoretical studies of morphology whose description of Arabic in Anderson 1985 is very typical of how linguists view Arabic morphology today. In the course of exemplifying stem modification processes Arabic is contrasted with Kwakwa'ala, a "polysynthetic" language, as follows: Arabic word formation involves "a limited set of processes" which apply to a limited type of basic, non-derived forms, while Kwak’ala word formation involves "a large set of (stem modification) processes [all suffixes]" which apply to "essentially any stem." According to Anderson, in Arabic a rule works on a stem which has not been modified by another rule (a "basic stem"), whereas in Kwakwa'ala a rule may apply to any stem, whether basic or derived. In other words, in Arabic the derivational process cannot be cumulative:
Once a root has been put into a given pattern, the only way to put it into another pattern is to replace the entire structure, thus destroying any reflection of the "first stage" in a derivation . . . . In the Semitic system, virtually all of the functional connections between a derivative and the basic stem must be associated with a one step relation. (Anderson 1985:38)\(^3\)

To bolster this description of Arabic, Anderson marginalizes affixal process almost to the point of oblivion: “Of course, the Semitic languages also employ a limited amount of affixation, and these affixes can be added to derived forms, but they are primarily inflectional in their use.” By limiting affixes in this way (and by emphasizing that what is important is the sheer number of affixes, and not the degree of generality of a particular affix) Anderson further magnifies the degree to which Arabic morphology is root and pattern dependent. However, as in any other morphological system, the actual number of possible affixes or processes is not as important as how productive these affixes or processes are, which is related to how many types of bases they apply to and how general the application is, not to their actual number. In these terms, affixal processes, while perhaps not as great in number as those based on roots and patterns (i.e., “non-concatenative” processes), are far more productive than any “non-concatenative” process.

Finally, it is interesting to note that Anderson, after having spent nearly twenty pages trying to “typologize” Arabic based on its morphology,

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3. Anderson focuses mainly on verbal derivation in Classical Arabic. He briefly notes (37) that there are thirty-five distinct patterns in nominal “derivation” but this observation is difficult to assess, since he does not make clear what “patterns” he is referring to. The most common types of “patterns” in Arabic nouns are the “broken plurals,” which, as the name implies, is an inflectional process, not a derivational one. Anderson also discusses the relationship between form and function in Arabic vs. Kwakwa’ala, claiming that a system such as that found in Arabic necessarily involves a “many to many” relation between form and function. This part of the discussion is rather obscure, since it is not clear if he is referring to semantic functions or syntactic functions. All derived forms are of the same morphological category and therefore have the same syntactic function; semantically each form has one primary meaning and oftentimes one or more secondary ones. But this is a common feature in many derivational processes. Whatever “function” may mean, Anderson certainly does not show that “many to many” relations are a necessary feature of a system like Arabic. A general criticism of Anderson’s approach is that he is comparing apples and oranges: he is comparing a prototypical derivational process (in Arabic) with one that is akin to an inflectional/quasi-syntactic process (in Kwakwa’ala) This may account in large part for many of the differences that he sees.
eventually recognizes that such an enterprise is "either trivializing, pro-
crustean, or impossible" (Anderson 1985:39). He notes quite rightly that it is
the word-formation processes themselves that can be typed in such a manner,
and it is a mystery why he did not put this into practice. Typing a language
based on the presence of certain morphological processes in it (e.g., as syn-
thetic, agglutinative, etc.) is akin to what I have termed "metonymizing" a
language based on a feature, which has the effect of overstating the impor-
tance of features that differentiate that language from others and under-
standing or ignoring the importance of features it shares with other languages.
A number of things happened in linguistics between Brockelmann
(1908) and Anderson (1985) which led to this reversal of views, the most
important of which was the development of structuralism (in the thirties, for-
ties, and fifties), which in turn gave way to generative linguistics (in the
fifties, sixties, and seventies), which then brought forth autosegmental
phonology (in the eighties and nineties), which has recently given birth to
optimality theory. Each one of these stages in the development of linguistic
theory and methodology had an effect on the representation of the Arabic
(and Semitic) morphology since each found in that system data which was
rather unique and whose exploitation could lead to interesting applications of
the theory and insights for language in general. But these approaches, while
at times insightful, have also been limiting and misleading in the judgments
that they put forth on Arabic morphology, as per the practices already noted.

**STRICTURALIST STUDIES OF ARABIC MORPHOLOGY**

Structuralist linguists appear to have taken a strong interest in the
Arabic (and Semitic) system of morphology following World War II, when
two papers in particular appeared which influenced the development of sub-
sequent studies toward emphasizing root and pattern over other processes:
Greenberg (1950) and Cantineau (1950). Greenberg's paper is perhaps one
of the most important and influential contributions to modern Semitic lin-
guistics, and it is still a topic which successive waves of linguistic theories
have turned to in order to show their mettle (as shown by Frisch et al. [1997]
recasting it in terms of optimality theory). Basing himself on the "scattered"
observations of Arab and Hebrew grammarians regarding incompatibility
between the consonants of a root, Greenberg undertook a statistical study of
verbal roots in Semitic and uncovered a series of co-occurrence restrictions
on homorganic consonants based on their place of occurrence in the root. He
first notes that there were no Proto-Semitic roots with identical I and II con-
sonants, while the restriction with identical I and III consonants was less
rigid, while identical II and III (geminates) were common. He then examines
the co-occurrence of consonants with similar places of articulation (= homorganic) and notes that the restriction can be extended to at least four classes of consonants (back, liquids, front, and labials). Greenberg’s paper was seminal (and has stood up well to time) and perhaps had more of an impact than any other work in advancing linguistic interest in the Arabic root and pattern system of morphology. Although Greenberg himself never overstated these findings in terms of generalizing root and pattern morphology to all of Arabic or Semitic words, he showed in a very convincing fashion the coherence of the consonantal root itself, abstracted away from the words in which it is instantiated, and this has had a lasting impact on linguistic analyses of Arabic morphology until today.

Cantineau’s (1950) analysis, unlike Greenberg’s, explicitly promotes root and pattern system as the primary (if not only) basis of Arabic and Semitic morphology, by explicitly demoting its potential rival, namely affixal processes. For him, roots and patterns represent two crisscrossing systems, enveloping the mass of Semitic vocabulary: “This double system profoundly characterizes Semitic languages. It is to be remarked that derivation by suffix or prefix is rather rarely employed” (Cantineau 1950:124). Cantineau’s view came to be the dominant view in the many structuralist analyses which appeared in the fifties and early sixties, especially those appearing in French. A classic example of this trend can be found in Fleisch (1956 and 1961) in which the affixal system of French is explicitly contrasted with the root system of Arabic.

Fleisch (1956) and (1961) provides the most explicit statement of the “estrangement” of Arabic (how it is different from a European language, viz., French) than any other writer covered in this study. He first of all describes French morphology, emphasizing not just affixation processes, but also characterizing it as involving notions such as “stability,” “inseparability,” and “family:”

In French, vocabulary formation is to a great extent on the basis of affixation: prefixes or suffixes added to a “radical” (or base); from the radical (base) “sabl” one finds in the word “sable,” one can make: by suffixation, sabl-er, sabl-erie, sabl-eur, [etc. . . .] All of these vocabulary words form what one calls a family of words, because they have a common radical/base . . . the base of the radical remains stable there. . . . We utilize in French a radical which is stable . . . composed of consonants and vowels which are completely inseparable. In order to form a word we elongate this radical, either by suffixes or prefixes. (Fleisch 1961: 247–249/1956:21–23, emphasis added)
Arabic is then distanced from French, through the generalization of the root and pattern system as the source of all vocabulary, thereby magnifying it and increasing the strangeness and uniqueness of the Arabic system:

Quite otherwise is the system of Arabic. It utilizes a “root” and not a “radical.” The root is composed of consonants (and only consonants) in a grouping to which is attached a general idea more or less precise. The realization of this idea in autonomous words is made by the play of vowels interior to this root. It is therefore the vowels which give their “form” to words in this sort of indeterminate matter which is the idea expressed by the root. (1961:248/1956:22)

... The great mass of Arabic vocabulary comes from a root of three consonants...the root k t b which carries the general idea of “writing” one has: kataba, kutiba, katb, kitaba, kūiba, ... [etc.]. (1961:249/1956:23)

As opposed to the “stability,” “inseparability,” and “family” orientation of French morphology, Arabic is then described as if its words were little Frankenstein monsters:

[The Arabic system of word formation is] totally different from that of French...Arabic starts out from a root, a consonantal carcass, a kind of skeleton which takes different bodies by the introduction of vowels. (1961:249/1956:23)

While Fleisch admits that Arabic does use some affixation, he marginalizes it, noting that affixes are used “here and there” and provide for a “remarkable enrichment” of the system, even though they are subordinate to root and pattern processes, or what he terms “internal flexion.”

The ultimate outcome of this trend in the French Arabic tradition can be seen in Roman (1999), in which the root is extended beyond its normal domain and is attributed even to particles to which a root is never attributed even in the most fanatical of “radicalists,”—i.e., to such basic particles as kam “how much” or fi “in”, which are considered by almost all researchers, traditional and modern, to be basic, undervived particles. The methodology that Roman employs is a complex one, in which there seems to be no attempt to clearly differentiate between synchronic and diachronic processes. It seems as if he has his morphology recapitulate the history of the language, no matter how ancient, which seems to be the linguistic equivalent of the natural history slogan “ontogeny recapitulates phylogeny” (i.e., the
development of an individual organism is a mirror of the natural or racial history of its kind) a position long since discredited in natural history studies but one which still makes an appearance now and then in analyses of Arabic morphology.

European Arabists in this period, however, have not all subscribed to such a view of Arabic morphology. Yushmanov (1961), while very sketchy does seem to give equal weight to affixal as well as to root and pattern processes: "There are three basic items in Arabic word-formation—root, vocalization, and auxiliaries (prefixes, suffixes, and infixes)" (Yushmanov 1961:34). He also seems to follow Brockelmann in insisting on using words as the basis for his discussion, and not simply the abstract root and pattern. Others, such as David Cohen and more recently Pierre Larcher have also been more evenhanded in the relative weight they have given to various types of morphological processes in Arabic. These writers and their analyses will be taken into account in future reviews.

American Structuralist

Schramm (1962) is an influential work in the framework of American structuralism. Utilizing a morphophonemic rule analysis, Schramm deals with the derivation of Arabic verbal stems (Forms I through X). The article is divided into three parts, the second section of which gives a summary and very traditional description of the system which is at odds with the introduction and the final section, in which a perfect stem and an imperfect stem for each form is derived separately from an abstract root by the insertion of Cs and Vs. This is an important work because it tried to make explicit the method of derivation of these forms, which in previous analyses were simply described in an ad hoc manner, if they were described in any detail at all. But there were as well significant limitations to the analysis which appear to have been inherited by subsequent analyses of this phenomenon in later generative and autosegmental analyses.

Schramm takes as the base of Arabic word formation processes the consonantal root, then derives from that in two separate processes the perfect verbs (Form I and derived forms, each derived individually from the root) and the imperfect verbs (Form I and derived forms, each derived individually from the root.) The derivation for each of these forms is broken up into two steps: one for adding Cs (of derived forms) and another for adding Vs. In doing so he is associating the nonroot consonants which are added to the derived patterns with the original root Cs, thereby privileging the consonantal root over the pattern. In other words, "root" seems to be synonymous with consonants, even when they are augmenting elements, and not basic ones.
This includes even the inflectional subject marker prefixes of the imperfect verb stems, even though they are clearly a different morphological process. This treatment of the consonants is similar in many respects to what appears in John McCarthy's work in the 1980s, although they differ very much in the way that they handle the vocalic patterns.

Unlike other writers, Schramm does not spend any time trying to convince the reader that Arabic is strange and unique because of its morphology. In other respects, however, his work displays the same limitations as do analyses which preceded and followed. First of all, he generalizes the root and pattern system in a very extreme fashion, by directly deriving each stem independently from a root, (automatically, as if it is a “phonemic” rule) and by the almost exclusive focus on the root and pattern, prioritizing roots and consonants (and their derivation) first, then the vocalic patterns and their distribution, in each of these parallel derivational dimensions as if they had nothing to do with one another. This is due to the methodological bias inherent in the “phonemic” nature of these “morphological” rules and gives an indication of the future direction of analyses: more and more emphasis is placed on the phonological aspect of these derivational rules, a striving for generality and automaticity, and (with this analysis) a bending of the framework to account for things that do not fit (in the future such data were simply ignored).

This methodological bias leads to two oversights or omissions in the data: first, he omits consideration of the semantic and formal relations between basic and derived word classes: e.g., the semantic (and at times formal) relation between Form I and Forms II, III, and IV; likewise no mention is made of the clear semantic and formal relationship between Forms II and V, Forms III and VI, etc. The phonemically based methodology leads him further to derive the perfect stem independently of the imperfect stem, therefore ignoring the obvious inflectional relationship between the perfect or past tense and the imperfect or nonpast tense.

In another important area Schramm manipulates the data and without explanation changes his framework in order to handle some recalcitrant facts about the language. He treats medial weak (hollow) roots and final weak roots differently from the rest of the roots by deriving the perfect of these verbs from the imperfect. This is in order to derive the vowelings on the perfect of these forms, which could not be automatically described given the theoretical machinery available at the time (and, for waw-final weak roots, cannot be phonemically or phonologically derived from the root at all). But it is also important to note that this is the last time that the derived forms of final weak roots are mentioned at all in linguistic analyses of Arabic of this type (since they cannot be handled in an automatic, phonological manner).
At the end he gives precedence in the order of the morphophonemic rules to the imperative stem (which places him in the camp of those who see the imperfect stem as basic, not the perfect) because it is the "oldest" and the shapes of other stems can be predicted starting with the imperative and not vice versa. This claim, however, was not shown by the analysis, nor was it even explicitly stated in this manner in the body of the article, since the only time it was exploited was in dealing with medial and final weak forms (which was a necessity given that they are not predictable from a simple phonemic-style derivation from the root). Also, it contradicts the claim in Section 1 of the article, in which the perfect was taken as the basic form, not the imperative. Aside from these facts, however, it echoes a tendency which recurs in the analyses of Arabic morphology, namely appealing to diachronicity in an ostensibly synchronic analysis. The tendency to have synchronic morphology recapitulate diachronic change may be a pitfall of morphological analysis in general (since morphology is, in a real sense, a repository of much that went on in the language beforehand), but it seems to appear with more regularity in analyses of Arabic morphology than those of other languages.

**Generative Phonology Analyses**

Brame (1970), as the title claims, deals with Arabic phonology, but in actual fact it is limited to what may be called the morphophonology of weak roots in Arabic (those with the glides waw or yaa in the initial, medial, or final position of the root). It was an important and very influential work, and it found its place even in Arabic pedagogical works (anyone familiar with the Abboud and McCarus, et al [1983] treatment of weak verbs knows something of this work). It represented a major shift in the representation of Arabic morphology, one which was even more geared toward treating morphological processes on phonological principles. This work stands apart from most of the other analyses examined here since it does not generalize the root and pattern system to the exclusion of all other processes. It goes, rather, in the opposite direction, generalizing (as much as possible) the positing of underlying glides for many instances of long vowels. This is due to the methodological framework, generative phonology: since generative phonological rules can work only on a single segment in a particular context, then patterns consisting of vowels of more than one quantity or quality were broken up into several different rules. Thus the notion of pattern was greatly weakened if not lost entirely, and, even though the concept of "root" retained some importance as the source of the underlying glides in weak roots, it too was completely undermined by the positing of prefixing and
infixed rules as the sources of many common patterns in the language. Due to this strong phonological bias, therefore, the morphological derivation of derived forms is in general not explicitly detailed, and the morphological notion of "base" or "stem" does not play a crucial role in most of the derivations. At one point, however, Brame (1970:149) does explicitly argue for the perfect verb form as being the base (as against the imperfect), which is the opposite of Schramm’s position (or at least the one stated at the end of the latter’s article). Despite this, the arguments for this position were based on rather marginal and questionable data, related to what he terms the “lame” stems, or final weak stems, of a very particular type, namely final-w with a stem vowel “-i-” as exemplified in the verb ṛadiya. Although Wehr lists this verb as /r-d-y/, Brame takes it as underlyingly /r-d-w/ due to the existence of the verbal noun ṛudwān. This creates a problem because one gets in the imperfect ya+rday+āni and not the expected ya+rda+w+āni. Brame explains this as being due to the “w-to-y” rule being ordered before stem vowel ablaut:

\[
y+a+radiw+a+ni \quad \text{(base)}
\]
\[
y+a+rdiw+a+ni \quad \text{Vowel elision}
\]
\[
y+a+rdiy+a+ni \quad \text{w-to-y}
\]
\[
y+a+rday+a+ni \quad \text{Ablaut}
\]

While this may be an argument in favor of “perfect as base form” it is of rather limited and marginal application, in addition to the fact that /r-d-y(w)/ is one of several dozen roots in which the final weak consonant/glided is recognized by Arabic lexicographers as being either waw or yaḍ. There are weightier, more intuitively satisfying arguments for the perfect as base, but in any case the argument points to the strong tendency throughout this analysis to try to explain the data in terms of phonological principles, even when there exist more compelling morphological and semantic reasons not to do so.

Brame’s phonological bias in dealing with what are essentially morphological processes leads him to posit increasingly abstract analyses. First note the derivational path in the above analysis of /r-d-w/: the subject prefix (ya-) and mood suffix (-a) are attached to the underlying perfect verb stem itself—there is no intermediate stage of deriving an imperfect stem separately from the perfect stem, but rather the same rules apply to the imperfect stem as apply to the perfect stem. This seems a bit redundant and basically is having the phonology recapitulate the derivational morphology for each and every word. In other proposed derivations, the demands of the methodology (for step-by-step, automated, generalized processes) leads to the positioning of
rules which have no morphological justification. For example, in deriving the passive imperfect verb (Brame 1970:438–439), there is no imperfect passive stem—rather the input to the “passive rule” is the perfect verb to which have been affixed the subject prefix and mood suffix, to which the “passive formation” rule applies (as it does to perfect verbs). This rule is then followed by two more phonological rules which have no more justification phonologically or morphologically other than to correct the output of the initial rule applying the perfect passive rule to an imperfect stem:

\[
\begin{align*}
\text{ta[t a + k a t t a b] u} & \quad \text{(base) } \rightarrow \\
& \text{Passive formation } \rightarrow \\
\text{ta[t a + k a t t i b] u} & \quad \text{Quasi-assimilation (the second half of passive rule) } \rightarrow \\
\text{tu[t u + k u t t i b] u} & \quad \text{Ablaut (applies to vowels in whole stem, not just to final) } \rightarrow \\
\text{tu[t a + k a t t a b] u}
\end{align*}
\]

Even though this rule is proposed in the context of showing the importance of distinguishing the stem from the rest of the word (a morphologically relevant notion), it nevertheless ignores the most basic of morphological distinctions, such as the difference between the perfect and the imperfect verb.

A further example of a morphological datum which is handled in a phonological manner is the analysis of the origin of the imperfect subject prefix vowel -u- in Forms II–IV. Brame postulates that this is due to the fact that the subject marker in these forms is followed by a single consonant plus a “strong cluster” (Brame 1970:252–253):

\[
\text{(II) tu- kat -tib} \\
\text{(III) tu- kā -tib} \\
\text{(IV) *tu- 'ak -tib } \rightarrow \text{ tu-k-tib}
\]

This makes it appear as a phonological fact when in fact there is nothing phonological about a “single C + strong cluster” that would change a “ta-” to a “tu-”, since these structures exist elsewhere in the language without such changes, most notably in derived Forms V and VI, as well as in some of the most common broken plural patterns (*maktab → makātib). More to the point, the same prefix vowel appears in all imperfect passives, yet the same conditioning factors do not (and cannot) apply. The prefix vowel -u- is simply part of a morphological paradigm, a relic of a once productive system which is no longer productive in the same way it once was.
The furthest that this phonological bias is taken is when Brame proposes (Brame 1970:246–247) that words of the pattern saḥīfat- and ḍarībat- are underlingly *ṣаḥyīfat- and *ḍarībat- in order to provide support for deriving Form II verbal noun taṣīr- from *taṣyir-, as well as to generalize their plural patterns. The ultimate goal of these proposals is the elimination of all long vowels in the lexicon by reanalyzing them as glide-vowel or vowel-glise: e.g., saḥīd- is at first postied as underlingly *ṣawhīd- (Brame 1970: 323), which is then ultimately represented underlingly as *wa+ṣahīd- (Brame 1970:418). That is, a very clear and very common pattern (Form I active participle) is ultimately represented in terms of a prefix which is then infixed and ultimately elided. This is then generalized to all Form I APs, even though most of them, especially those referring to humans, do not take the “fawā’iḍ” plural pattern, the ostensible reason for positing the “wa-prefix to infix” rule in the first place. Form III imperfect is also “infical in nature,” (Brame 1970:425), derived in the following manner:

\[
\begin{align*}
\text{ta} & \quad + \quad w+\text{ka}-\text{tib} & \quad + & \quad u & \quad \text{wa infixation} \\
\text{ta} & \quad + \quad \text{kwa}-\text{tib} & \quad + & \quad u & \quad \text{Glide metathesis} \\
\text{tu} & \quad + \quad \text{kaw}-\text{tib} & \quad + & \quad u & \quad \text{ta- to tu} \\
\text{tu} & \quad + \quad \text{kā} & \quad -\text{tib} & \quad + & \quad u & \quad \text{V-epenthesis} \\
\text{tu} & \quad + \quad \text{kā} & \quad -\text{tib} & \quad + & \quad u & \quad \text{G-syncope} \\
\text{tu} & \quad + \quad \text{kā} & \quad -\text{tib} & \quad + & \quad u & \quad \text{lengthening}
\end{align*}
\]

Due to the nature of the methodological framework and the single-minded focus of the analysis (on “weak” verbs or those with glides), the view of the entire system of Arabic morphology (as an extension of phonology) is distorted, resulting in an analysis which undermines the very notion of root and pattern.

In addition to the distortions in the analysis occasioned by the methodology and focus, there is a striking omission in this analysis which deals almost exclusively with weak roots viz., the lack of any mention of final weak roots in derived forms. Only once (Brame 1970:39) is there mention of such a root in a derived context, and that is the Form X passive participle of /q-ḍ-y/, which happens to work with the rules adumbrated by Brame (since it has a final root –y–). There is no mention in this work (and in all

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4. It is interesting to note that these are the same “iambic plural patterns that McCarthy and Prince (1991) later metonymize into the basic feature of Arabic prosodic morphology.
subsequent linguistic analyses of Arabic morphology that I am aware of) of
the derived forms (Form II to X) of waw-final roots, which is significant
because there is no way to derive the perfect of these forms\(^5\) directly from
the root using phonologically based rules. For example, for Form X \(-sta-d\-\-\-a\)
one cannot posit as an underlying form the expected \(*-sta-d\-\-aw-a\) since the
perfect stem for the first and second persons (both singular and plural) is
\(-sta-d\-\-ay\). In a similar fashion, if an underlying \(*-awa-\) is posited in Forms
V and VI for the imperfect feminine plurals and for the verbal nouns, they
should be respectively \(*ya-tad\-\-aw-na\) (not the attested \(ya-tad\-\-ay-na\)) and
\(*tad\-\-an\) (not the attested \(tad\-\-in\)). What makes this omission even more
startling is the fact that it has been perpetuated in all subsequent works. I
have not yet found any major linguistic work which mentions these forms in
its description of Arabic morphology. One reason is that these forms (waw-
final roots) cannot be derived using only a root and pattern analysis, nor
from a phonologically based framework, because these are examples of a
morphological paradigm based on analogical leveling, a generalization of
a suffixed form without regard to root.

Taking the imperfect verb as the more basic form might be one way of
representing this analogical leveling (and for some, of explaining it), but in
my opinion doing so creates more problems than it solves, problems which
are not fully considered in analyses which take the imperfect as the base.
Examples of the kinds of problems that can arise in an analysis that takes the
imperfect stem as the base are to be found in McOmber (1995), which is
very much in the early generative phonological tradition. The basic claim of
this analysis is that the most efficient lexical root for Arabic verbs is
CCvC—namely, the imperfect stem of Form I verbs—because it allows “a
reduction in the diacritic system for the six basic ablaut groups” in Form I
verbs (McOmber 1995:177). That is, statistically speaking one can gain a
greater degree of predictability of which vowels appear by making the
imperfect the base, not the perfect. This is based mainly on the one-to-many
relation between an /a/ stem vowel in the perfect and either a /u/, /i/, or /a/
in the imperfect. By taking the imperfect as base, one can predict which stem
vowel will show up in the perfect (by making it into a one-to-one relation).
But there is one omission here which is crucially overlooked: McOmber
assumes that the generalization regarding guttural consonants in second and
third root consonant positions and the /a/-/al/ ablaut pattern (i.e., guttural-C

\(^5\) Note that since the stem vowel in the imperfect for most derived forms is /iy/ which
affects a change of /w/ to /y/, the imperfect forms can be explained using a phono-
logically based framework.
roots which have an /a/ in the perfect have an /a/ in the imperfect, rather than
the expected /i/ also holds in the opposite direction, but that is not the case:
several hundred verbs with a guttural consonant in second and third posi-
tions have an /a/ stem vowel in the imperfect but have an /i/ stem vowel in
the perfect (based on a review of the *Hans Wehr Arabic–English
Dictionary*). Thus while McOmber’s approach gains predictability in the
Imperfect (u/i) → Perfect (a) set, it loses it in the Imperfect (a) → Perfect
(i/a) set: most of the verbs with guttural Cs that have an /a/ in the imperfect
have an /i/ in the perfect, not an /a/ (which is assumed by McOmber). That
is, capturing a generalization or explanation of one set of facts by positing
the imperfect as base results in the loss of generalizations or explanations of
other sets of facts. In addition to this point, and returning to the original
point (viz., the difficulty of accounting for derived waw-final verbs in an
automatic, phonological manner), it may well have been the case that the
imperfect was the source historically for the analogical leveling of /w/ to /yy/
in these roots, which was then extended to the perfect verb paradigm as well
(and even to the imperfect of Forms V and VI which do not have an /i-/ stem vowel). However, the question remains: does this possible diachronic
sequence of events need to be recapitulated in a synchronic representation of
the morphology? The complete answer to this question must consider the
full range of generalizations that positing one form as basic over another
form might provide, a task which I must leave for future consideration.

Brame (1970) is significant in the way that it influenced subsequent lin-
guistic analyses of Arabic morphology, moving them further away from
considerations of issues relevant to morphology per se, a direction that was
taken even further in the metrical and autosegmental analyses which fol-
lowed in the eighties and nineties. Yet while Brame was led by the biases
of his generative phonology framework into distancing himself further and
further from the notion of “pattern” as a whole, the biases of later theories
took up this notion and extended it far beyond its utility in describing
the language while still using and extending the phonological model for
morphological analys...
Metrical/autosegmental Phonology

Autosegmental (or “metrical”) phonology was developed in a series of articles and dissertations from the late seventies and early eighties. One of the principal authors involved in this, John McCarthy, uses a great deal of Arabic data to develop his analytical framework. As precursors for his analysis he harkens back to two works which dealt with root and pattern morphology in Hebrew, Harris (1944) and Chomsky (1951), and he sees his theory as an extension of Harris’s “long-component” analysis, which allowed for the representation of an “interrupted” morpheme or affix on a simultaneous level of representation. The framework as set forth in McCarthy (1981) really does provide a clear and insightful way of characterizing root and pattern processes, as well as syllabic structuring processes and stress placement rules, although his characterization of previous traditional schema is overly negative and based on limited information. Despite the insights that the approach affords, it is very much phonological in its outlook and practice despite the fact that it purports to deal with morphological facts, and the question of what the tiered representations are actually supposed to represent is never satisfactorily clarified. Space limitations prevent a detailed consideration of the many analyses done in the 1980s within this framework, so I will confine my remarks to McCarthy and Prince (1990) (hereafter M&P 1990), an analysis that seemed to be a culmination of sorts to this approach, displaying a number of insightful observations, but quite a few of its worst excesses as well.

The argument of the paper appears to be, simply stated, that in order for an analysis to derive broken plural patterns the pattern of the singular must be taken into account. From a morphological point of view such an argument would not need adumbration, but due to the overwhelmingly phonological bias of linguistic analyses of Arabic morphology from structuralism to the metrical/autosegmental approach (which privileges the consonantal root as the source or base of each and every word in Arabic and not another word or stem) this appears to be an original observation. The focus of the paper is further narrowed—and its main argument further heightened—by the ultimate (metonymic) claim that “for Arabic . . . the diversity of phonological, morphological, and poetic phenomena can be shown to depend on just the

He considers the possibility that doubled roots may have derived originally from medially hamzated roots. The entire discussion, however, makes little or no reference to comparative Semitic data and is completely groundless diachronically speaking, serving only to provide support (unsuccessfully) for the goals of the methodological framework from an outside field of theoretical linguistic discourse.
two quantity-sensitive foot types supplied by phonological theory" (M&P 1990:262). That is, Arabic plurals are overwhelmingly iambic (involving a sequence of a short syllable followed by a long syllable), and so are wide swaths of other parts of the language. The methodology used to show this is basically autosegmental phonology which takes into account morphological features such as "base form" and is characterized in their words as "a theory of phonological circumscription of the morphological base" in which "[morphological] rules [may call] on phonological criteria to further delineate the base or domain to which they apply (M&P 1990:225). This all by itself would have been a positive development in the ongoing evolution of linguistic analyses of Arabic morphology, since it is actually taking into account some morphological features. However, the authors had in mind a much grander generalization, namely, attempting to prove that an iambic principle underlies the whole of Arabic, and just a few broken plurals.

The crux of the problem that they set up for themselves is how to relate the singular of a noun to its broken plural pattern—or, as they term it, the "transfer problem": how to transfer various characteristics from the singular to the broken plural, which cannot be handled in a CV-based templatic morphology. While they seem to be getting away from a strictly root and pattern approach (and are actually dealing with a morphological issue) they nevertheless are still exclusively concerned with the pattern, which they term the "prosodic structure" and characterize in modified terms as that of the "minimal word" (M&P 1990:217–219):

The central plural-forming strategy of the language parses out an initial minimal word from the base . . . and maps the contents of that minimal word onto an iambic foot.

Later in the paper this structure is then generalized ("telescoped") throughout the language:

It follows that the plural template must be the canonical iambic foot, which directly expresses the plural invariant and includes no mention of irrelevant "optional" material . . . Therefore the plural morpheme is actually only a partial template, or rather: it gives the rules for manipulating the initial part of the syllabic structure to produce a "plural" N. (M&P 1990:251)

In other words, the iambic foot is the plural template in Arabic, which is then related further to other "iambic" structures and processes throughout
the language. It is important to note here that they are less concerned with describing Arabic than with providing a "test case" for their theory:

The broken plural, then, makes a full systematic use of the categories and operations provided by the theory of Prosodic Morphology, providing a particularly interesting test case and a robust new source of evidence for the theory. (M&P 1990:210)

The argument for this test case, however, is seriously flawed, due to important omissions in the data, as well as to a cavalier manipulation of important aspects of the data which seriously undermine the argument. The first omission or oversight has to do with the source of the data upon which they base the argument: they scanned the first half of the Hans Wehr Arabic–English Dictionary and collected tokens of broken plural forms (only broken plural forms, and only those that are listed in this dictionary.) These tokens are then taken as representing the Arabic lexicon. Using a dictionary literally as a lexicon is a very naive mistake, and one which is not confined to this analysis. No dictionary (especially not a foreign language one such as Hans Wehr) lists all of the possible word formations, especially the most productive ones (synchronically). This leads to a skew in the data, as evidenced by a preponderance in the data of nouns of the "mvf\textsuperscript{v}(v)l" type (of the "Q-pattern," referring to "quadrilateral" or involving four consonants), which represent about 30% of the words in their sample. All of the Q-patterns that are listed are Form I passive participles, nouns of time, place, and instrument, and some "true" quadrilaterals; it is unlikely that words of these classes represent 30% of the words in Arabic.\footnote{I will not provide a dictionary count here to counter M&P's own count, one reason being that it is easy enough for a readers with an elementary knowledge of Arabic to do this for themselves; but it is due as well to the fact that by countering their count with one of my own I would be indulging in the same faulty style of representation that they made recourse to, which would tend to legitimate the very method I am seeking to criticize. Part of the problem lies in the fact that researchers have often engaged in dictionary counts of this sort not as a first step in a longer and more complicated process of investigation but rather to generalize the results of the initial, rather simplistic sampling of the Arabic lexicon.} Note too that the implication of this sample is that all or most of "Q-patterns" take broken plurals (with the overt claim being that their plurals are "iambic"), yet most "Q-types" are derived participles, and they—with very, very few exceptions—take sound plurals.
This leads to the second, more serious omission, namely the marginalization of sound plurals. The treatment of sound plurals reflects both the manner in which Arabic is estranged, as well as an attempt at justifying the omission of data which overwhelmingly undermines the central argument of the paper, which allows them to telescope in on the broken plurals and to magnify their presence. The estrangement is carried out by showing that Arabic affixal plural patterns (the "sound plurals") are quite limited in their domain, especially when compared with similar processes in a language like English:

Although the term "sound plural" suggests normality—and indeed its form is entirely predictable from gender and other grammatical information—the sound plural is in no way the regular or usual mode of pluralization. Essentially all canonically shaped lexical nouns of Arabic take broken plurals, including many loans. (M&P 1990:211–213)

After noting the restrictions on the domains where the sound plurals are applicable in Arabic, they compare it to English processes by noting that Arabic sound plurals are similar to English regular plural and past tense suffixes since they represent the "general case" (regular, default) morphology, as against "special case" morphologies represented in Arabic by the broken plurals and in English by "subregular" morphologies:

English words transparently derived from other categories always take the regular suffixes, even if they qualify for subregular morphology (underived "leaf / leaves", but [derived] Toronto Maple Leafs, two letter f's [*evz]). In the [English] verbal system subregularities apply to simple verbal stems and their verbal derivatives but not to derivatives of adjectives or nouns ("rang the bell" vs. "ringed the camp", from [[ring]n]v). (M&P 1990:211–213)

The difference between the two languages (according to M&P) lies in the "range of applicability" of the general case versus the special case in the two languages: the range of the "general case" in English (regular plural and past tense suffixes) is "vastly wider" than that of the general case in Arabic (the sound plural), while the "special case" in Arabic (the broken plural) is "fully articulated and relatively few items escape it to end up with the default 'sound' suffix" as against the English special case which "do not span much of the input space (and they do so sporadically)." The analogy they make may be represented as follows:
M&P were essentially arguing that Arabic sound plurals represent a “minority default” rule. Whereas most default rules represent the most general or unmarked case (the rule which applies “elsewhere” after all other more specific rules have applied), the “elsewhere” rule in Arabic applies to the least number of cases. Aside from the fact that this argument woefully misrepresents and overstates the limits on the domain of sound plurals in Arabic, M&P’s claim that Arabic sound plurals are an example of a “minority default” rule entered into linguistic generic practice and came to be accepted by a number of researchers, especially in cognitive linguistic studies, as noted in Boudelaar and Gaskell (2002). However, as the latter paper shows convincingly, the Arabic sound plural is not a minority default system, since SP’s are the most general type of plural marking—i.e., they represent a “normal” type of default rule, namely the most general or least restricted case.8

How sound plurals came to be represented in this analysis as if they were an extremely restricted process, when in reality they represent the most productive plural process in the language, is instructive. The marginalization of sound plurals is brought off by the manner in which M&P characterize the domains of applicability of sound vs. broken plurals: sound plurals are characterized in terms of morphological/semantic categories, while broken plurals are characterized in terms of phonological form.

Sound plurals thus apply “only to a few” categories of certain semantic classes (proper names, names of letters of the alphabet [mostly noncanonical],9 noncanonical or unassimilated loans, transparently derived nouns of

8, 9. The authors go on to argue that such “minority default” systems are very rare in natural language, since they are inherently unstable. Their work is also based on a different method of “counting,” which, although far superior to a simple dictionary based count, should also be examined carefully for its own inherent bias.

The claim that the letters of the alphabet are “mostly noncanonical” and that is the reason they take feminine sound plurals is misleading. Twelve of the twenty-eight letters are of the form fāʾ, which is a rare nominal form (which nevertheless may take a broken plural), but the rest are of rather common patterns, which may and often do take broken plurals with other classes of nouns. The reason this class of nouns (as well as proper names) takes feminine sound plurals is based on a semantic criterion—they refer to classes of things which are used to refer to an aspect of language metalinguistically.
adjectives such as participles, deverbals, and diminutives). Leaving aside the fact that the list is far from complete, no mention is made of how large or productive these categories actually are, especially the "transparently derived" participles and verbal nouns (which are so transparent they cannot be seen in this analysis). Furthermore, this claim implies that sound plurals are somehow restricted semantically and formally, yet this is not the case at all: semantically they may apply to virtually any semantic or morphological class of noun, even those where broken plurals are the dominant pattern plurals, and phonologically they may apply to virtually any noun pattern in the language, primarily by virtue of the distribution of feminine sound plurals (masculine sound plurals being much more limited in their domain than feminine sound plurals; duals have no such restrictions).

The domain of broken plurals, on the other hand, is stated in phonological terms: "all canonical forms take broken plurals," and since it is not stated, it is implied that they are not restricted by semantic/morphological criteria; both the claim and the implication are incorrect. Broken plurals cannot apply to all phonological forms in Arabic, the most obvious (and copious) examples of being the "transparently derived" verbal participles and nouns, which are perhaps the most productive word-formation devices in Arabic. Broken plurals are further restricted semantically and morphologically: they apply primarily to masculine nouns, and to feminine nouns only when they refer to nonhumans (or to humans as chattel). Furthermore, there is no form that exclusively takes a broken plural and can never take a sound plural; there are many forms, however, that may take only sound plurals.

Sound plurals are not a minority default case as M&P claim. Although broken plurals have a far wider domain than do the alternate plurals in English, the latter are extremely restricted and the contrast between the two was meant to exaggerate the domain of the former.

A more appropriate phenomenon in English to compare to Arabic sound versus broken plural frequency patterning would have been the contrast between "strong" (or irregular) verb morphology (sing-sang-sung, go-went-gone) and regular verbal morphology. While the former type of verb is no longer productive and is restricted paradigmatically, it nonetheless has a relatively high frequency due to the fact that many of the most common and frequently used verbs in English are of that type. Similarly, while sound plurals simply overwhelm broken plurals in the numbers and types of nouns they apply to paradigmatically (and would overwhelm a simple dictionary count) in terms of frequency of use, broken plurals may have more actual tokens present in a discourse (although how many would vary depending on the type of text). Both broken and sound plurals fall under certain restrictions, some
of them phonological and some morphological/semantic in scope. However, in terms of the sheer numbers and generality of these restrictions, the broken plurals have far more of them than do the sound plurals, period. In essence, M&P’s representation reversed the actual state of affairs. One reason for this is probably related to the form and process of sound plurals: they are the reverse of the iambic pattern which this analysis attempted to generalize as the plural pattern in Arabic. They are suffixed to the end of the noun (while the iambic foot is infixed at the beginning of a word), and they are all “trochaic” (or a sequence of long-short syllables: -ūna, -āt-un, -āni).

The effort to generalize the iambic foot took its most egregious form in the way data concerning the most common broken plural form (Paʃaːl) was manipulated to fit the iambic pattern.10 From the very first listing, this type is listed as “iambic” (of the form *faːl) despite the fact that it clearly involves a “long-long” syllable pair.11 This claim is based on Levy (1971), a dissertation on Arabic broken plurals written in the framework of Generative Phonology, similar to that used by Brame (1970). As previously noted, this framework was generally constrained to representing phonological (and quasi-morphological) derivations segment by segment, which would require an intermediate form such as faːl followed by an ad hoc “Ca metathesis” rule. This limitation was a significant one, especially in its representations of Arabic morphological patterns which involve more than one segment. It was this kind of limitation that the metrical/autosegmental approach (developed in particular by McCarthy) overcame with ease and a great deal of insight, so it seems strange that M&P would resort to using

10 M&P also enhance their analysis of Arabic with copious references to other languages—in fact, they must hold the record on this: in 18 pages (225–244) they refer to 21 different languages This is in the context of developing an account of “extrametricality” and “the use of a prosodic constraint to positively identify a rule’s domain,” which is “fundamental to the way that iambic plural and diminutive morphology is imposed in Arabic.” This review results in “a taxonomy of prosodic specification (a generalization over 14 languages)” that “brings the surprisingly wide range of specification effects under a single general theory.” Aside from the fact that doubts may arise as to the correctness of some of this wide-ranging data given the problems they had in dealing with the Arabic data, this procedure indicates the very strong drive in a theory-centric analysis (which devalues language specific rules) to universalize language data, whatever the cost may be to language specific realities.

11 The list of “iambic” plurals are contrasted with another labelled as “trochaic,” which contains words with two short syllables. Elsewhere trochaic is understood (in a quantitative and not stress based system such as Classical Arabic) as involving a “long-short” syllable pair. There is no indication as to why this term is applied to the list of “short-short” singular forms
such an argument, which they probably would reject in other contexts. I can see no other justification for this form or for the “Ca metathesis rule” other than the constraints of a superceded theory and the demands of a present-day one. The supporting evidence listed in Levy (1971:90–93, 259) is that one can posit the same underlying form for three other ṭafṭa(a)l patterns, but there is no independent argument for why these others must be underlyingly faḍa(a)l either. According to Levy, the elative adjective is formed from /kabari/ then (by Ca metathesis) → ṭakbari, while “verbs of surprise” are formed from the base /kadabi/ then (by Ca metathesis) → ṭakdabi, and the number “four” is formed from the base /rabac/ then (by Ca metathesis) → ṭarbac. But there is no reason for anyone (except a generative phonologist circa 1970) to derive these surface forms from these bases: the elative form and verbs of surprise are related most directly to basic adjectives of various forms (mainly of the pattern faḍa, faḍa, faḍl, and the like), while ṭarbac is most likely a basic, underived noun. The further independent support which is mentioned (viz., that “certain nouns and adjectives with stems CVC followed by the masculine suffix +ān to the fem. suff. +āb and ay take CaCāC plurals plus + ay. . . . These cases exceptionally retain the underlying CaCāC pattern”) looks as if it contradicts their claim, not supports it: if there are CaCāC forms on the surface (such as these and others) why would Ca sometimes metathesize and sometimes not? In short, there is no convincing, independent phonological reason given for why these things need to be analyzed as “metathesized” forms: they never exist on the surface “unmetathesized,” and never have in the recorded history of the language.12

M&P’s adoption of Levy’s analysis of ṭafṭa(ā)l plurals is very important, because this plural pattern is the most productive broken plural pattern in the language. Finding a specific percentage of this pattern is difficult, but it is acknowledged in all of the sources I checked as being the most common one. Murtonen (1964:2) lists it as the most frequently used in Classical Arabic at 13.71% of his sample, and in adding up these broken plurals as listed in Levy (1971) I found that they constituted about 63% of her sample of the same type of nouns as found in M&P, which translated into M&P’s numbers is about 30% of the iambics listed, and about 20–23% of all of the examples listed, while in Boudelaa and Gaskell they represent about 23% of the broken plurals found in their sample. Whatever the figure is, this is a significant group, and one which places a considerable obstacle in front of the iambic hypothesis.

The one final push to magnify the iambic hypothesis and metonymize it to encompass all of Arabic is accomplished by an attempt to marginalize the Form I active participle faḍāl pattern (which is another significant roadblock

12. This criticism has also been made in Hudson (1986).
to the iambicization of Arabic since it is a trochaic pattern, the reverse of iambic), and by an appeal to the iambicity of Arabic poetic meters, both of which rest on references to Fleisch (1968, 1956). Fleisch (1956:49–50) notices as well a preference for “iambic” singular forms (note that his whole discussion deals with singular forms, not plurals), but this is not based on a count of words in the dictionary, but rather on how many of the possible vowel–consonant permutations are actually utilized. Word counts are not given either for the iambic types nor for qātil, but he notes that “qātil owes its great diffusion to its morphological function.” M&P try to bolster Fleisch’s observation regarding an iambic preference in Arabic singular noun forms by providing a count of these forms versus the fā'il forms based on their dictionary survey. However this survey, as noted above, is flawed due to the fact that it leaves out of consideration productive forms (such as the Form I active participle fā'il) which would not be listed in the dictionary. Rather than the 263 which they list they should have counted nearly every Form I verb token, which would have given a more accurate count of fā'il tokens. Even though the fā'il form is “only one category,” it is one of the most productive ones in the language, and proper weight should be given to that fact.

The active participle fā'il form is further marginalized as being “prosodically incoherent” first by their redefining the notion of trochaic foot as opposed to the “coherent” iambic foot (an argument which is not clearly explained here and appears to be ad hoc as it stands), and second by saying that it is limited only to the Form I active participle and because of that it is derived and not basic. Therefore there is no role for the “prosodically incoherent” CvvCvC sequence as a primitive, undervived template. Yet the privileging of “basic-ness” was not taken into account before in this argument in evaluating forms. If it had been, then most of the singular forms which give rise to iambic plurals would have to be recognized as “prosodically incoherent” as well, since they are “long-short” (trochaic) or “long-long” and are primarily “derived” forms: Form I passive participles (mafi'il), nouns of place (mafi'al) and instrument (mufla(a)l), quadrilateral verbal nouns (fa'lalat-), etc. Privileging this notion of being “basic” equally throughout the paper would also weaken the central argument of the paper, which is based on plural forms, which themselves are not “basic” but “derive” from singular nouns.

13. They leave out of their count those forms with “diphthongs,” which Fleisch had included with the “fā'il” type.
14. I say “nearly every” since there are a limited number of stative verbs which do not use the fā'il pattern.
The second area which depends on a reference to Fleisch (1968) to push the case for iambicizing the representation of Arabic is his comments on "iambic" meters, which he notes are the most common. But this observation is based on an arbitrary definition of what an iambic meter is and a superficial understanding of the Arabic meters and how it relates (if at all) to Arabic morphology. Paraphrasing Fleisch, iambic meters are those whose feet begin or end with an iambic watid or "peg"—the unchanging element in a meter. But this definition would include all of the other meters listed, except for two (madid and ramal, where the watid occurs internal to the foot), and would include those meters which have a non-iambic watid (which occurs in only one foot in the line, the others being "iambic"). In addition, the arbitrariness of applying labels such as "iambic" to Arabic meters is shown by noting that Wright lists different meters as being iambic, based on Ewald’s different parsing of feet, not based on the Arabic measures.

Nearly all watids that occur in Arabic poetry are "iambic," and one writer (Abû Dib 1974) has proposed a system whereby the non-iambic watid is done away with altogether, which would make all the meters in Arabic "iambic," if such a characterization has any meaning by that point. In any case, the whole notion that the poetic watid has relevance for nominal patterns in morphology is misguided. The watid is a very abstract structuring principle in Arabic meter, one that makes no reference whatsoever to where it appears in relation to an actual word in a line of verse: it may appear at any place in a word, or between words, including on a case vowel (an aspect of the language which is not even taken into account in this analysis). Referencing it in this kind of study which deals with morphology is simply tendentious and misleading.

These contradictions, and the fact that most of the verbal derivation system contradicts their iambic vision, does not seem to matter to those who are intent on refashioning Arabic in their methodological image. By end of paper, Arabic becomes "iambic": like Massignon’s metonymic characterization of Arabic as “luqat al-ṣaddād,” for M&P Arabic becomes characterized in whole by its "iambic" parts. Broken plurals which use an iambic foot are definitely an important aspect of Arabic morphology, but not to the extent claimed in M&P (1990), who went too far in trying to expand some valid insights concerning one area of the morphology into a universal organizing principle. It is hoped that linguists will look more critically at this.

15. E.g., Forms II, III, IV create a heavy syllable at the beginning, while VII, VIII, IX, X have affixes which create heavy syllables at the beginning of the word. Since these are the stems for the every class of word which is derived from them, this argues considerably against extending the characterization of Arabic as "iambic."
analysis, and others like it, and avoid the pitfalls that come with too great a push for universalizing particular language structures, which often results in metonymizing a single feature over a whole language rather than on a true cross-linguistic generalization.

The claims put forth in M&P (1990) have become part of generic linguistic discourse, as witnessed by a number of references to them in scholarly articles, and even in textbooks, during the last ten years. They are briefly summarized with almost no change in M&P (1995:325–332), where the plural of hukm “governing” is listed (twice: 319 and 345) as hakâm, and not the correct ḫakām. This imaginary plural (and another: ḍanāb as the plural of ḍināb “grape(s)”, not the correct ḫalnāb) has now entered into linguistic discourse and is to be found most recently in an introductory textbook, Radford et al. (1999:191–192) as part of a morphology exercise. In another article Golston and van der Hulst (1999) note:

Languages that express morphological category by shape, such as Classical Arabic . . . also show the necessity of underlying prosody. The point has been made repeatedly in the literature that morphemes in such languages may consist solely of a certain prosodic shape: this is underlying foot structure, another clear case of underlying prosody. Consider McCarthy and Prince’s analysis of the Arabic Broken Plural as an iambic foot . . . . Underlying prosody constitutes the underlying form of this morpheme; again, a clearer case of underlying prosody cannot be imagined. (170–171, my emphasis)

Golston and Riad (1997) treat the claim that iambicity rules in the Arabic poetic meters, essentially repeating and extending the claims of M&P (1990), with the final comment (“prosodic metrics gives us a way of understanding Arabic meter in terms of the structure of Arabic and in terms of the structure of the language generally” [Golston and Riad 1997:129]) indicating that they accept the metonymizing of the iambic structure to all of Arabic. Brentari (1995:636) describes Arabic as the “extreme” case of languages with morphological templates, therefore “needing little or no ordering of featural material,” just the opposite of English.

17. This text also contains the observation that Semitic languages tend not to represent vowels directly, which is a half-truth—long vowels in Arabic and Hebrew are usually written out with alphabetical letters.
Not all authors have been so accepting of M&P's (1990) proposals. For example, unlike the previous authors, Paoli (1999) offers some stiff criticism of M&P (1990) based upon their understanding (or lack thereof) of “plurals of paucity” (Paʃ‘āl) and “plurals of abundance” (fuʕāl, fiʕāl, fuʕāl). He offers instead an insightful suggestion that the relationship between singulars and their broken plurals may rest on a rhythmic alternation, and not on a single foot: iambs in the singular are “transformed” in trochees in the plural, and vice versa. He also makes reference to poetry and meters, but only to offer a very reasonable proposal that the demands of poetry (involving different meters and rhymes) may be partly responsible for the great variety of broken plurals found in Arabic lexicographic works. Both of these are only suggestions in need of further analysis, but they do point out the presence of alternatives to what appears to be the dominant linguistic method of dealing with Arabic broken plurals.

Arabic Morphological “Radicalism” in Experimental Phonology

The arguments presented in Berg and Abdel-Jawad (1996) and Frisch and Zwaydah (2001) reflect how the extreme “radicalist” (and phonologically based) representation of Arabic morphology has entered mainstream linguistic discourse and affected even the more empiricist of the linguistic subfields. The goal of Berg and Abdel-Jawad (1996) (B&A–J 1996) is the extension of root and pattern representations into “real time” by examining slips of tongue in Arabic versus German and English. They claim that in Arabic (which “Arabic” is not specified) slips are less “structure sensitive” than they are in German, due to the fact that suprasegmental structures are absent from underlying representations. Rather, they unfold gradually in real time: “The erection of hierarchical representations is claimed to be slower in Arabic than in English and German because the nonconcatenative morphology of Arabic prevents an early assignment of consonants to structural slots.” (B&A–J 1996:291). The net result of this claim—although phrased in a very scientific manner—is essentially the estrangement of Arabic based on its root and pattern morphology, a common motif in linguistic representations of Arabic morphology. Root and pattern morphology is understood as the primary or even the only word-formation process in Arabic and is contrasted to English and German in very exaggerated terms: there are “massive structural differences” between Arabic and English, the latter having continuous stems, prefixes, and suffixes while Arabic seems to have only discontinuous roots and transfixes: “Word formation in Arabic involves the intercalation of these discontinuous morphemes, which are assigned to different levels of representation.” It also represents the extension of an overly
simplified representation at one level (root and pattern morphology) into other levels as well, and makes the claim that these morphological derivations were actually being carried out in real time.

The extension of phonological concerns into morphology is very explicit. As they state it: “One foremost task for phonological research is to elucidate the organization of segments within words.” But the most intriguing aspect of this bias is shown in the way that the phonological worldview (i.e., the linguistic sound system as an ongoing, productive process) is applied to morphology. In discussing the constraints on how two linguistic units may interact (B&A-J 1996:296–297), they first reify the linguistic “representation” of segments ("two segments are more likely to interact when they are represented in similar or identical fashion"), such that what are basically artifacts of linguistic theories or frameworks (the “representation”) have become the reasons for the linguistic behavior under investigation—the map has become the territory. They next assume that morphological “representations” are purely phonological in nature, in that they involve processes (derivations) that take place in real time: “underlying representations are assumed to lack syllabic information. . . . It follows . . . that the suprasegmental structure of a word has to be built up in the course of the derivation,” which “takes time.” This line of argument shows the unintended effect of representing morphological relationships as “processes” here, rather than being understood as “redundant rules” expressing static relationships between forms, they are seen as actual ongoing processes, which interact with the ongoing phonological processes involved in speech production.

The clear implication of their argument is that Arabic does not have words, but rather that speakers of Arabic are busy “intercalating” the root and pattern morphemes even as they speak, exemplified clearly in the following:

English speakers compose by concatenating morphemes while Arabic speakers compose by intercalation. . . . In English the full phonological form is available right from the outset of the derivation. It is known that window is a disyllabic word; that the /w/ occupies the word onset; that the alveolar nasal is syllable-final; that the alveolar stop is syllable initial, and so on. Because the position of each segment within the syllable or word and its immediate context are clear, all the information that is required for the erection of suprasegmental structure is on

18 Another instance of a map becoming the territory is their conclusion that in Arabic “the mental lexicon is organized not unlike a typical dictionary of Arabic” B&A-J 1996:321.
hand...However this is not so in Arabic. When the verb root \( k-t-b \) is selected, it is not clear which segments will be filled at all. By implication, it is not known at the beginning in which syllable position a radical consonant will ultimately appear. For instance, the first radical is syllable initial in \( ki\&abun \) but syllable final in \( maktab \). The same is true of the third radical \( /b/ \). Thus, neither the position of a given consonant nor its segmental context are known beforehand. They are the outcome of the intercalation process. (B&A–J 1996:315)

There may also be problems with omissions in the data which may have skewed the results. For example, the Arabic sample is much more limited and less systematically recorded than the German, and there is no sample for English, just tokens taken from the pertinent literature. The Arabic data is simply not well specified—the kinds of errors noted may be due as much to the limitations in perception as to the actual mode of production, since they were not recorded and extracted during a later playback. That is, they may be errors of perception as much as they are errors of production. The linguist noting down these errors may not have caught all of the different varieties, since his or her ear was primed for a specific type. Using recorded speech may have overcome this limitation but that would have been an extremely time-consuming operation.

Frisch and Zwaydah (2001) take up where Berg and Abdel-Jawad (1996) left off, by trying to demonstrate the psychological reality of an abstract consonant dissimilation constraint based on the concept of a lexicon which is made up of abstract roots. This paper is the latest in a long line of papers which derives from Greenberg (1950), which was the first to propose (using modern linguistic methods) that Semitic triconsonantal roots (not just Arabic) avoided homorganic consonants. Since that time the extreme “radicalism” which has overtaken studies of Arabic morphology has extended and distended Greenberg’s claims quite a bit, but this paper takes it up a few notches.

The main goal of the paper is to prove that roots in Arabic are “real,” but the “reality” of roots seems apparent from the start, since they form the basis for the bulk of Arabic words. What the authors are after, however, is a conception of the root independent of the pattern it appears with and the word which they together produce. Based on Berg and Abdel-Jawad (1996), they start with the premise that “there is clear psycholinguistic evidence that Arabic consonantal roots are a distinct component of the Arabic mental lexicon” (Frisch & Zwaydah 2001:92). In other words, something like /k-t-b/ is present in the lexicon and is utilized by Arabic speakers in producing words
in real time as they speak. While previous approaches used statistical studies of dictionaries as their sources, data, their approach is based on well-formedness judgments of "native speakers" (although it should be phrased as "native readers" since they use written examples for the elicitation of the judgments). Perhaps due to space constraints, no examples of this data are given, which makes it difficult to fully assess the study. Like previous studies, however, the methodology they are working within is generative phonological theory, in which "phonotactic constraints are typically categorical statements of well-formedness."

As with previous studies of Arabic morphology, their analysis contains a number of claims which are either exaggerated or simply not true. For example, a central claim is that in Arabic root consonants do not appear together in words ("Arabic is interesting because root consonants do not usually appear adjacent to one another in the words of the language." [Frisch & Zwaydah 2001:91]), but as it stands this is not borne out by the data. If by Arabic they mean classical or literary Arabic (which is likely given that they used written examples as their data gathering method), then there are scores of patterns in which either the first two consonants are contiguous (maf'al, mif'al, taf'il, qaf'al, istaf'al, and on and on), or the last two consonants are contiguous (faj'la, faj'la, qaf'al, etc.). It is simply not true that Arabic root consonants do not appear adjacent to one another in words—they do, and often.

What they may be referring to is the notion that Arabic seldom has consonant clusters, which is something quite different from adjacency (and, while somewhat true, again has been exaggerated) However, "avoidance of consonant clustering" in itself does not seem a sufficiently strong enough constraint for their argument, and thus it was generalized up one more level into an "avoidance of consonant adjacency." What is accomplished by making this more powerful claim is that the consonant dissimilation constraint is made to appear more "abstract," and thus in need of the kind of "reification" that they provide. Also, by exaggerating the "abstractness" of the root, it can be used to show the efficacy of a theory (such as generative phonology) that deals with abstract representations and constraints:

Arabic has a root-and-pattern morphology, where consonants from the verbal root are interleaved with vowels in a manner prescribed by a lexical template. Due to the abstractness of lexical roots, an investigation of the psychological reality of consonantal cooccurrence constraints defined over root consonants provides a strong test of abstract generative theories of competence. (Frisch & Zwaydah 2001:91)
In addition, they appear to take the notion of “abstract” to be synonymous with “unreal” and thus in need of proof of its reality, but this is a misunderstanding of the notion of “abstractness.” The fact that the consonantal root does not have an independent existence outside of its appearance in words does not make it any less “real”—it has a phonetic realization in these words, and it is recognized and manipulated by native speakers, and that is a sufficient indication of their “reality.” Its independence outside of these words is an abstraction, but that process of abstraction does not negate its realization within words, and there is no need to prove the existence of the root beyond its realization in words.

These last two analyses may be seen as the end result of the practice in recent theoretical linguistic discourse of representing Arabic morphology as if it were phonology or syntax—i.e., as if it were a creative, synthetic process, ongoing in real time, in which words are synthesized from their component parts as the sentence is synthesized from various syntactic categories and the sound structure of the sentence is manufactured through the congruence of a limited set of articulatory and acoustic elements available to a language. However, morphology is not “processive” as are syntax and phonology but is rather more like a static domain, involving paradigmatic or associative relationships of some sort, but not active and ongoing processes. It is important that this conception of morphology should be reflected in the representation somehow.

Treating morphology as phonology (or extending systems of representations which reflect characteristics of the sound system to the lexical system) has led to other problems, as outlined in the previous sections of this paper. Structuralist (phonemic) as well as autosegmentalist (metrical) accounts of Arabic morphology have overgeneralized the root and pattern system of Arabic, while generative phonological treatments have ignored it. This leads in each of these approaches to the generalization (or metonymization) of peripheral structures, as well as to the choice of base forms based on what works best for the theory and not on what is appropriate given a methodology that is applied consistently across languages. In the following section I will briefly sketch an alternative methodology which, while not without its own limitations and biases, strives to use a more appropriate system of representation for morphological features and to apply it consistently from one language to another.

**Alternative Approaches**

Alternative approaches to analyzing Arabic morphology should try to address some of the outstanding shortcomings of the linguistic tradition
outlined above, which (I must emphasize) are not found in all linguistic works, but is a prominent and influential part of the tradition. First of all, while I do not wish to estrange Arabic from other languages because of its root and pattern morphology, I do not want to marginalize this feature or to diminish its distinctiveness. However, I would like to bring back into the analysis of Arabic morphology aspects of the morphology which have been marginalized, notably a consideration of just how many processes may be viewed as root and pattern versus affixal. This will be based on a methodology which understands morphology as fundamentally involving the study of the relationships between words, relationships which may be more formal and recognizable in a linguistic way (paradigmatic) as well as those which may be less formal or recognized linguistically but may nevertheless be culturally prominent in other ways (associative). The data for such analyses should be more broad based, including the examination of morphological entities in context (written as well as spoken), a consideration of how to count or weigh morphological types versus tokens, the avoidance of the tendency to ignore or fix the data to make it fit the method, and a recognition of the limitations of using foreign language dictionaries as sources of morphological data. I can outline only briefly in what follows my own "methodological bias" in dealing with Arabic morphology and give a few examples of how it might be applied to various processes in Arabic. Further work involving more data must wait for the future.

My methodological bias is one that is morphological, in which morphology is understood in a much more static way than it is elsewhere in linguistics. A typical linguistic definition of morphology is that it is the study of "word-formation" which emphasizes process and derivation as process. I would prefer rather that it be understood as the study of the relationships between words and word classes in the lexicon. The relationships between word and word classes may be represented in several different ways. The most typical way of representing these relations linguistically is in terms of paradigms, involving notions such as the distinction between derivation and inflection, morphemes, bases and affixes, etc. There are other ways of representing the relationships between words which do not make crucial use of these notions, however, but rather reflect the ways that words and word classes may be associated with each other in less linear and direct pathways. These associative relations are represented in the many ways that users of the

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19. The term associative is taken from Larcher (1999), who in turn derived it from Cantineau (1950). Larcher's understanding of the term is not exactly the same as what I have in mind here, but it is close.
language creatively exploit the language and its features, through such
devices as paronomasia (which range in Arabic from popular puns, word
play, and folk etymologies to the highly developed poetic system of jinās),
as well as systems of rhyme and meter, etc. The basis for this latter type of
relational system in Arabic crucially involves root relationships (between
words of the same or nearly similar roots) and pattern relationships (be-
tween words of the same pattern), either or both of which may be activated
in certain culturally defined contexts, such as those which formed the basis
of Massignon’s (1954) article.

Both of these ways of viewing word relationships (paradigmatic and
associative) are conventional; i.e., they are cultural products the consumers
of which have accepted, learned, or been inculcated with a set of conven-
tions on how to understand, evaluate, and respond to them. Representations
of word relations in terms of paradigms are directed towards an audience of
linguists, grammarians, and their students (which, in the case of traditional
grammar, may include any person with a formal education). Associative
relations are less formally circumscribed, outside of the literary tradition
of paronomasia. Understanding these forms of representation as conventional
does not mean that they do not represent something “real” about the lan-
guage; rather it underscores their limitations and contingent nature, which
must be kept in mind in evaluating them as representations and in evaluat-
ing their further representation in linguistic analyses.

The distinction between these two approaches to word relations is
important in understanding the ways that some linguists have fallen short in
representing Arabic morphology in recent years: namely, that they have
taken the more loosely defined associative relations (which rely centrally on
root and pattern) for the more formal paradigmatic ones (in which more than
just root and pattern are involved). That is, linguists have been comparing
formal, paradigmatic processes in other languages to what are less formal,
associative relationships in Arabic. An examination of associative types of
relationship and how it is manifested in the culture will be a topic for future
work; the remainder of this article will present a brief overview of Arabic
paradigmatic morphology.

Arabic Paradigmatic Morphology in a Relational-Based System
of Morphological Representation

Paradigmatic morphology is typically described in processive terms as
the study of word-\textit{formation:} inflectional \textit{processes}, derivational \textit{processes},
non-concatenative \textit{processes}, and so on. This is despite the fact that most lin-
guists conceive of the lexicon as being made up of words, with the generative
rules that describe how these words relate to one another being “redundant” (according to McCarthy 1981:373), a redundant rule being a “rule which fills in predictable or redundant information. Redundancy rules have two important properties: (a) they do not create structure, and (b) they do not alter structure.”

Representing static paradigmatic relationships between words in the lexicon in terms of processes is one of the long-standing conventions of linguistic morphology, one that has been carried over from traditional and pedagogical grammars. The consequences of this convention of representation can be seen in the latter two papers reviewed above, in which experimental phonologists have tried to prove (or have assumed) the reality of “processes” which are merely conventional artifacts of the representation and are not meant to actually represent a process. In order to avoid the problems associated with this form of representation, in the following I will use the term relation instead of process, and will try to paraphrase other processive terms in non-processive ways.

In these terms, paradigmatic morphology may be described as the study of the relationships between words in the lexicon, represented initially as the relationship between two terms (the base and the output in traditional terms)

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20. See <http://users.info.unicaen.fr/~tlebarbe/Linguistics_Lexicon/lr_r.html>. In M&P (1990:227) the processive representation of stress placement in Latin warrants the following unenlightening caveat: “notice that the display in (18) is not a ‘derivation’ in the usual sense, but simply a sequence of clarifications through which the meaning of each expression is brought out.”

21. Ferguson criticized Fleisch for his use of “process terminology” to describe static structural relations in Arabic, relating it to the influence of historical linguistics, among other things (Belnap & Haeri 1997:230) Belnap and Haeri also note Hockett’s 1954 review of “item and arrangement” (IA) and “item and process” (IP) methods of representation. The alternative methodology I sketch here, however, is not to be equated with Hockett’s IA method, since the latter appears to contain many assumptions and restrictions on linguistic representation which my method does not adhere to. For example, IA as described by Hockett strives to avoid giving priority to any one element of a representation, which is in line with attempts by American structuralists of Hockett’s time to distance their representations as much as possible from historical representations. However, giving priority to one form over another (as I do in my method) is not meant as a reflection of historical processes but rather as a reflection of relative formal or semantic simplicity, which may also be formulated in terms of degrees of markedness. Also, while Hockett (1954) (and others such as Harris [1951; Hymes & Fought 1981:144]) saw process and nonprocess representations as notational variants of sorts and equally good (or limited), they did not foresee the way representations stated in terms of processes could be misconstrued as representing real time, ongoing linguistic process in psycholinguistic analyses.
as mediated by a third term (the affix), based initially on identifying those parts of words which they share (the base) and those which they do not share (the affix, what is “added on” in processive terms). In traditional terms this may be represented as base + affix → output, which I translate into non-processive form as follows: 1(base) / 2 (affix) : 3 (target), read as the base (term 1) is related to the target (term 3) as mediated by the presence of the affix (term 2). These elements are represented in the abstract as morphemes which have a concrete realization in morphs.22

The directionality encoded in the processive representation is here understood as being a precedence in a hierarchy of forms, where precedence is determined by the relative simplicity or complexity of forms based on their formal or semantic features. For example, in many languages the singular forms generally take precedence over the plural forms both formally (it lacks the marker for plurality) and semantically (one comes before two), and therefore the singular is taken as the base. Occasionally the formal element may take precedence; e.g., in Arabic there exist “plural” in the form of collective nouns which formally are simpler than their singular forms, which may be formed either by the addition of a tā’ marbūṭa or a yā’ to the end of the collective, depending on the form. Directionality, precedence, and the criteria which determine them are artifacts of the convention of representation; although they may reflect important and “real” aspects of the language, it is important to evaluate them critically to see what is being focused on and why, and to keep in mind what is being left out of the representation. Figure 1 contains a representation of Arabic morphological relations in terms of a precedence hierarchy.

Notions such as base and affix are at the heart of paradigmatic morphology and play a role in the definition of most of the basic terms. For example, the basic distinction between inflection and derivation has to do with a distinction in the category membership between the base and target: inflectional relations involve words of the same word-class or paradigm, while derivational relations involve words of different word-classes or paradigms. In addition, the definitions of traditional typological categories (analytic vs. synthetic, inflectional vs. agglutinative) depend on distinguishing different types of bases and affixes.23 For example, the distinction between

22. An additional distinction, similar to this, is made by Bauer (1988) between abstract “lexemes” and their concrete realization, “word-forms.”
23. Traditionally these terms were used to typologize languages (or what I term “metonymize” them based on a certain feature), but such an endeavor is misleading. The terms nevertheless are valid as categories for defining different processes within languages.
analytic versus synthetic is dependent on whether the "affix" can function as an independent word or not (in the sense that it is not an obligatorily bound morph): synthetic relations involve affixes which are obligatorily bound morphs, while analytic relations involve "affixes" (or what correspond functionally to affixes in a particular paradigm) which may function as independent words. Within synthetic relations, there is a further distinction between "inflectional" relations and agglutinative ones, related to the function of the affix and how segmentable it is from the base: inflectional relations are those in which the affix is typically multifunctional and not clearly segmentable from the base, while agglutinative relations are those in which the affix has one function and is clearly segmentable from the base.

Definition of Non-Concatenative Relation (NCR)

Many traditional categories in paradigmatic morphology therefore depend crucially on the notions of base and affix and how they relate. To these traditional categories may be added a further feature which can serve to distinguish types of morphological relations, namely the degree to which the medial term (the affix) references structure internal to the first term (the base) in relating it to the third term (the target), to which I will apply McCarthy's terms concatenative and non-concatenative. Concatenative relations (CR) involve little or no internal referencing of the base by the affix, whereas non-concatenative relations (NCR) do involve internal referencing of the base in some way, either through differences in syllabic structuring, vowel quality, or both. What is most important in these relations is how the medial term (the affix) relates internally to the base.

Non-concatenative relations (NCR) are therefore defined as involving a number of different characteristics, which are all necessary features of non-concatenative relations. NCRs must reference the internal structuring of the base in relation to the target and must involve relating differing syllable structures in the base and target, whether that is due to a difference in the number of segments or in the kind of segments. (In processive terms this would be represented as the deletion or reduplication of segment(s) within the base, or as the interpolation of another discontinuous, multisegmental derivational/inflectional morph within the base.) This definition will include within the category of non-concatenative relations many of the NCRs felt to be typical of Arabic root and pattern morphology (such as passive formation and broken plurals), but it will exclude certain others, such as stem-vowel ablaut (since it involves only a single segment) and circumfixes (which, although discontinuous themselves, do not internally reference the base). These distinctions may be seen as a way in which the data can be "massaged" into my
preconceived framework (in order to decrease the number of NCR relations), but I think that it is more insightful to consider morphological relations in terms of a continuum and to distinguish between those relations that are typically understood as NCR from those that lie farther away from them on a continuum between CR and NCR relations, such as stem vowel ablaut.

In the methodology being discussed here, the base of every derivational and inflectional relation is an actual word or stem, not an abstract root by itself, nor an abstract CV-pattern by itself. For example, in the (inflectional) relation going from perfect verb to imperfect verb the base morph is the stem *katab*- , while the inflectional “affix” morph is the pattern -CCvC-, which is simply a representation of how the base is to be related syllabically to the target. In all the representations of derivational and inflectional relations which I will present in what follows, the base morph of each relation is taken to be a word or stem, the claim being that the consonantal root does not exist in the lexicon independently of a word or stem. Note that in making this claim I am not trying to devalue the “root” as being an important organizing principle in Arabic morphology or as a basic element in word relations in Arabic. I am however trying to circumscribe and limit its role and function much more so than is typically done in a phonologically based morphological analysis.

*Examples of NCR in Arabic:*

Table 3 contains a summary of the major derivational and inflectional relations under consideration here. The first section contains four types of verbal derivation. The first of these, in column one, perfect verb stem derivation, involves several different bases and relations, and is detailed in modified autosegmental terms in Table 4. The first level of derivation involves Forms II, III, and IV, each of which has a Form I perfect verb (or occasionally a nominal form) as its base, with a NCR derivational affix. The second level of derivation involves either a Form I verb or a previously derived stem (II, III, or IV), which is combined with an CR derivational affix: Form V and Form IV have as their bases Form II and Form III respectively, to which is added a *ta*- prefix; Forms VII and VIII have as their bases a Form I stem, to which is added a *-n*- prefix and a *-t*- infix respectively; and Form X has as its base a Form IV stem, to which is added (after deletion of 'a') a *-sta*- prefix. In sum, out of the eight derived forms under consideration here, only three involve NCRs; the rest involve simple prefixation.24

24 In summary: Forms II–IV have as their bases either Form I verbs, or nouns, but no higher verbs (V–X); Forms V–X have as their bases forms I–IV, and only occasionally nouns or adjectives. For all of the derived forms, I take the vowel *-a*- as a “default” vowel, not really as an indication of active voice in and of itself.
As represented in Table 4, Forms II, III, and IV (the first level of derivation) clearly involve NCRs (i.e., relations internal to the stem). All of the medial terms (affixes) indicate a differentiation of internal syllabic structure between base and target: in Form II this involves a duplicate stem-internal C, Form III a duplicate stem-internal V, while Form IV involves the lack of a stem-internal V, as well as the presence of a prefix. The "affixal" morphemes of these forms are represented in terms of CV-skeleta, while forms that involve CRs (Forms V to X) are not represented in terms of CV-skeleta. The claim that is embodied in this scheme is that CV-skeleta are morphologically relevant only for non-concatenative relations. CV-skeleta are therefore not relevant for every morphological relation in Arabic.

The skeletal Cs and Vs are related to the base Cs and Vs in a traditional manner: the Cs and Vs in a morphemic CV-skeleta (such as those in II to IV) are indexed as to which Cs and which Vs they are to be associated with, and they are associated with the base CVs according to the latter's order within the base morpheme. For example, the derivational morpheme for Form II is [CVCCVC], the initial C is indexed to associate with the initial C of the base, the two medial Cs are indexed to associate with the middle C of the base, and the final C is indexed to associate with the final C of the base. The arguments against such an approach have their basis in a phonological approach to these phenomena. In phonological analysis, especially with regard to tonal and stress systems, morpheme boundaries are often overlooked, and morpheme internal structure is rarely relevant. Automatic spreading of suprasegmental features through morphemes and across morpheme and word boundaries is common, and a rule like the "Association Convention" is a natural reflection of these facts. Unlike phonology, however, morphological analysis can, and often must, make reference to morpheme boundaries and to morpheme-internal structure. Indexing Cs (and Vs) for association is a reflection of the fact that, especially for NCRs, base-internal structure is relevant and important.25

The second type of verbal derivation in Table 3 involves verbal noun derivation, detailed in column 2. Out of the nine types under consideration here, three involve CRs, with the perfect verb stem as the base: Form III (with both a prefix and a suffix), Form V and VI, whose derivation involves verb stem ablaut. Of the rest, Forms IV, VII, VIII, and X involve the same NCR differentiation in syllable and vowel pattern structuring: a target stem

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25 In the figures in Table 2, I have indicated only the association that is central to the derivation, such as middle C reduplication in Form II and first V reduplication in Form III.
vowel which is long, with the vowel prior to it in the pattern of a different quality, /u/. Form II involves a differentiation of syllable structure (a vowelless medial C along with a stem vowel of a different length and quality), as well as the presence of a prefix, ta-. The third type of verbal derivation in Table 3 is participle derivation, both active and passive (column 3). The base for both types of participles is the imperfect verb stem (since for most verb types the stem vowel of the participles reflects the stem vowel of the concomitant "voice" form of the imperfect verb), and of all the forms, only Form I involves NCRs—the rest all involve suffixes, i.e., only concatenative relations.

The second section of Table 3 summarizes verbal inflection, with four main categories: (1) Tense (including perfect and imperfect), (2) Voice (including active and passive), (3) Mood (including indicative, subjunctive, and jussive), and (4) Subject Agreement (including person, number, gender for both perfect and imperfect stems). Out of all of these inflectional relations (numbering approximately 12, if one includes three categories of subject agreement for perfect and imperfect separately), only one exclusively involves a NCR, viz., passive derivation based on the perfect stem, while another (tense inflection) involves a NCR in only one form (Form I). All of the rest involve CRs—either suffixes, prefixes, a combination of these, or stem vowel ablaut.

There are two areas in this representation which deal with the language data in a manner which should be looked at critically. The first is my assumption that the subject markers and their vowels (/u/ for Forms II, III, IV, and passive imperfects, /a/ for all the rest) do not form part of the imperfect vowel pattern, since leaving them out makes it easier for me to claim that imperfect verb inflection does not involve an NCR. I did this based on the following assumptions: that subject inflection (which involves the subject person prefixes) is a separate morphological relation, independent from tense inflection which precedes it and that vowels in Arabic tend to be "attached" to the preceding consonant (they are never in the onset position of a syllable). Based on these assumptions, I think it is preferable (in the sense that it seems to reflect something "real" about the language) to have these vowels be associated with subject inflection and not with tense inflection. The net result of this (aside from making tense inflection a NCR) is a complication in the subject inflection: there now have to be two sets (or declensions) of imperfect subject markers: the "yu- set" for II, III, IV, and passives, and the "ya- set" (for all else). To me this seems like a more palatable "complication" than the alternative of positing a more abstract NCR form like -u-darris as the NCR stem of Form II, etc.
The second area which should be examined critically is my claim that stem-vowel ablaut, which is the principle method of verbal tense/aspect inflection, is not a NCR. This relation involves a differentiation in the vowel quality of the final vowel in a base morpheme. In one respect it is like a NCR, namely that it is internal to the base. However, the fact that it involves only one segment, and does not involve differentiation of syllabic structure, makes it unlike most typical NCRs in Arabic. This is also reflected in how such a relation may be represented: the vocalic change may be represented as a feature at the end of a stem which indicates that the first vowel in from the end is affected. Such a relation may be thought of as not fully concatenative or non-concatenative, but rather somewhere in between, peripheral to both main types. In the analysis presented here, however, it is conceived of as being closer to a concatenative relation than to a typical non-concatenative one.

Section IV summarizes nominal derivational relations. Included here are several relations which involve suffixation of the ṭāʾ marbūta, the most important of which is nominal gender derivation. Of the other types of nominal derivation I have included place noun derivation and instrument noun derivation, both of which involve differentiation in syllable structure (either verbal or nominal) as well as prefixation of mu- or mi-. Among the NCRs not detailed here are a number of verbal adjectival forms such as the intensive or occupational form (faʾṣāl), the quasi-participle form (faʾlān), and others which are somewhat common but not exceedingly productive.

Section III of Table 3 summarizes various nominal inflectional patterns: number, case, and (in)definiteness. The latter two categories are exclusively concatenative, while the first involves both NCRs (broken plurals) and CRs (sound plurals). Broken plurals are very common and varied, usually involving differentiation in both syllable structure and vowel patterning. However, in terms of productivity (measured in terms of the number and types of bases to which they apply), sound plurals are far more “common.”

Figure 1 contains a representation of the morphological relations described in Table 3 in terms of a hierarchy of precedence (the Roman numerals and numbers to the left of each line indicate where that relation is to be found in Table 3, while “S-D-P” in line II (3) means “singular-dual-plural, (I)-S-J in line II (4) means “indicative, subjunctive, jussive”, and “N-G-A” in line IV (5) stands for “nominative, genitive, accusative”).

**Summary**

In sum, Arabic morphological relations are a mixture of different types, involving concatenative and non-concatenative relations, sometimes both in
the same derivation. Neither derivational nor inflectional relations as a whole are dominated by NCRs, although certain subtypes do prefer NCRs over CRs (such as perfect passive inflection). The target of both NCRs and CRs may serve as the base for further relations, either NCR or CR. If these relations are CRs, then there is ample opportunity for an accumulation of affixes, contrary to the observations of Anderson (1985). For example, a derived participle (whether active or passive) may encode at least five derivational and inflectional relations, most of which are concatenative:

\[
\text{[---derivational--]} [\text{--inflectional--}] \\
\]

(5) \hspace{1cm} 2 \hspace{1cm} 1 \hspace{1cm} 3 \hspace{1cm} 4 \hspace{1cm} (5)

(def.) \hspace{0.5cm} \{ [part.] \hspace{0.2cm} [imperf. stem] \} \hspace{0.5cm} \text{gender/\#} \hspace{0.5cm} \text{case} \hspace{0.5cm} \text{(indef)}

(al) \hspace{1cm} \text{mu} \hspace{0.5cm} \text{darris} \hspace{0.5cm} \text{at} \hspace{0.5cm} \text{u} \hspace{0.5cm} \text{(n)}

The same type of accumulation can be seen with verbs:

\[
2 \hspace{1cm} 1 \hspace{1cm} 3 \hspace{1cm} 4 \\
pers./gen. \hspace{0.5cm} \text{pres.} \hspace{0.5cm} \text{plur.} \hspace{0.5cm} \text{mood}
\]

ya \hspace{0.5cm} \text{ktub} \hspace{0.5cm} \text{uu} \hspace{0.5cm} \text{na}

Finally, as regards the representation of these relations: I have represented in CV-skeletal form only those morphemes which involve NCRs, since these are the only forms for which base-internal syllabic structure are relevant. Within these representations, I have chosen to represent the NCRs as involving some sort of indexing, since, as morphological relations, they should make reference to morphemes and morpheme structure. Furthermore, morphemes for certain forms involve different types of relations, which must all be represented at a morphemic level: prefixation, syllable restructuring, vowel melody adjustments, etc.
**Table 3: Summary of Derivational and Inflectional Relations in Arabic: Concatenative or Non- Concatenative?**

**I. Verbal Derivation:**

<table>
<thead>
<tr>
<th>(1) Verb Stems (verb : verb)</th>
<th>(2) Verbal Nouns (verb : noun)</th>
<th>(3) Participles (verb : noun / adjective)</th>
<th>Passive (base = passive imperf.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I  CvCvC</td>
<td>I  (various)</td>
<td>Active (base = active imperf.)</td>
<td>ma-CCuC</td>
</tr>
<tr>
<td>II CaCCaC</td>
<td>II taCCiiC</td>
<td>I CāCiC</td>
<td>ma-CCuC</td>
</tr>
<tr>
<td>III CāCaC</td>
<td>III mu-CāCaC-at</td>
<td>II mu-CaCCiC</td>
<td>ma-CCuC</td>
</tr>
<tr>
<td>IV 'aCCac</td>
<td>IV 'iCCāC</td>
<td>III mu-CāCiC</td>
<td>ma-CCuC</td>
</tr>
<tr>
<td>V  ta- + II</td>
<td>V  taCaCCuC (A)</td>
<td>IV mu-CCiC</td>
<td>ma-CCuC</td>
</tr>
<tr>
<td>VI ta- + III</td>
<td>VI taCāCuc (A)</td>
<td>V  mu-taCaCCCiC (A)</td>
<td>ma-CCuC</td>
</tr>
<tr>
<td>VII n- + I</td>
<td>VII nCiCāC</td>
<td>VI mu-taCāCiC (A)</td>
<td>ma-CCuC</td>
</tr>
<tr>
<td>VIII -t- + I</td>
<td>VIII CtiCāC</td>
<td>VII mu-nCaCiC</td>
<td>ma-CCuC</td>
</tr>
<tr>
<td>X  st- + IV</td>
<td>X  stiCāC</td>
<td>VIII mu-CtaCiC</td>
<td>ma-CCuC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(4) Place Nouns (base = perfect vb (?))</th>
<th>(5) Instrument Nouns (base = perfect vb (?))</th>
<th>(6) Misc. Verbal Adjectives (base = perfect vb (?))</th>
</tr>
</thead>
<tbody>
<tr>
<td>I maCCaC (at)</td>
<td>I miCCa (a) C (at)</td>
<td>I (various)</td>
</tr>
</tbody>
</table>

*Concatenative processes indicated with underlined type, non-concatenative with italicized, and ablaut by an (A).*
Table 3 (Cont.): II. Verbal inflection:

(1) **Tense**  
(past : nonpast)  
base = perfect verb  

<table>
<thead>
<tr>
<th>I</th>
<th>-CCvC-</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>-CvCCiC-  (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>-CvvCiC-  (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>-Cc$i$C-  (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>-ta-CvCCaC-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>-ta-CvvCaC-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VII</td>
<td>-n-CvCIjC- (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIII</td>
<td>-C-t-vCIjC- (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>-sta-CCjC (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(2) **Voice**  
(Active : Passive)  
(a) **Past** (base = active perfect)  
(b) **Nonpast** (base = active imperf.)  

<table>
<thead>
<tr>
<th>I</th>
<th>CuCiC-</th>
<th>I</th>
<th>-CCaC-  (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>CuCCiC-</td>
<td>II</td>
<td>-CvCCaC-  (A)</td>
</tr>
<tr>
<td>III</td>
<td>CuCuCjC-</td>
<td>III</td>
<td>-CvvCaC-  (A)</td>
</tr>
<tr>
<td>IV</td>
<td>'tuCCiC-</td>
<td>IV</td>
<td>-Cc$g$C-  (A)</td>
</tr>
<tr>
<td>V</td>
<td>tuCuCCjC-</td>
<td>V</td>
<td>-taCvCCaC-</td>
</tr>
<tr>
<td>VI</td>
<td>tuCuCuCjC-</td>
<td>VI</td>
<td>-taCvvCaC-</td>
</tr>
<tr>
<td>VII</td>
<td>-</td>
<td>VII</td>
<td>-</td>
</tr>
<tr>
<td>VIII</td>
<td>(u) CtuCiC-</td>
<td>VIII</td>
<td>-CtvCaC-  (A)</td>
</tr>
<tr>
<td>X</td>
<td>(u) stuCjC-</td>
<td>X</td>
<td>-staCCjC- (A)</td>
</tr>
</tbody>
</table>

(3) **Subject inflection**  
(person/number/gender (past and non-past): all concatenative)  
base = perfect stem +  

<table>
<thead>
<tr>
<th>base = imperfect stem +</th>
<th>base = imperfect stem +</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a -ā -uu</td>
<td>3 ya- ... -u</td>
</tr>
<tr>
<td>-at -at -na</td>
<td>ta- ... -u</td>
</tr>
<tr>
<td>-ta- -tumā -tum</td>
<td>ta- ... -u</td>
</tr>
<tr>
<td>-ti -tumā -tunna</td>
<td>ta- ... -ā ii -na</td>
</tr>
<tr>
<td>-tu -nā</td>
<td>'a- ... -u</td>
</tr>
</tbody>
</table>

**Sing.** dual plural  
pers. sing. dual : pers. plur. gender  

(4) **Mood**  
(nonpast (= imperfect) only): all concatenative  
(change in suffix: see above table)
**Table 3 (Cont.): III. Nominal derivation:**

1. **Gender**: (masc. stem): (stem) + at-
2. **Miscellaneous nouns**: (stem): (stem) + at-
   - collective: instance // abstract: concrete // sing.: collective

**IV. Nominal inflection:**

1. **Number**
   - (a) sound plurals
   - (b) broken plurals
2. **Definiteness**
3. **Case**
4. **Indefiniteness**
FIGURE 1: HIERARCHY OF PARADIGMATIC MORPHOLOGICAL RELATIONS IN ARABIC

I & II. The verbal hierarchy:

Verb to verb derivations and verb inflection:

Base:

I (1) Verbal derivation:

perfect stem derived (all perfect stems)

Form I perfect (CaCvC)

II (1) Tense inflection:

imperfect stem

II (2) Passive inflection:

passive (active)

II (3) Subject inflection

(S)-D-P, etc.

II (4) Mood inflection

(I)-S J

Verb to noun derivations:

→ II (2) Verbal noun derivation (also: place & instrument nouns Form I)

→ I (3) Participle derivation (imperfect stem only)
**III & IV. The nominal hierarchy:**

**Noun to noun derivation & inflection:**

Base:

III (1) Gender derivation

IV (1) Number

(subtypes) broken plu. sound plu.

IV (2) Definite inflection: -l-

IV (3) Case inflection:

triptote N-G-A+ N-G-A+ N-G-A+ N-G-A+
diptote N-G/A # N-G/A # N-G/A # N-G/A #
"uni-tote" (-v)+ (-v)+ (-v)+ (-v)+
"a-tote" (-v) # (-v) # (-v) # (-v) #
sound plural [N-G/A] # [N-G/A] # [N-G/A] # [N-G/A] #

**Noun to verb derivation**

basic noun → verb (Form II, III, IV)
(denominatives)
<table>
<thead>
<tr>
<th>Table 4: Verb Stem Derivation: Concatenative vs. Non-concatenative Relations</th>
</tr>
</thead>
<tbody>
<tr>
<td>*II:</td>
</tr>
<tr>
<td>[ \mu [d a r a s] ]</td>
</tr>
<tr>
<td>( \mu [C v C v C] )</td>
</tr>
<tr>
<td>( \mu [d a r a s] )</td>
</tr>
<tr>
<td>(base: [verb I/noun])</td>
</tr>
<tr>
<td>(affix: morpheme: [II: causative/intensive/etc.]</td>
</tr>
<tr>
<td>morph: ( m[C v C v C] )</td>
</tr>
<tr>
<td>(= reduplication of stem-internal C)</td>
</tr>
<tr>
<td>(target)</td>
</tr>
<tr>
<td>*III:</td>
</tr>
<tr>
<td>[ \mu [d a r a s] ]</td>
</tr>
<tr>
<td>( \mu [C v C v C] )</td>
</tr>
<tr>
<td>( \mu [d a r a s] )</td>
</tr>
<tr>
<td>(base: [verb I/noun])</td>
</tr>
<tr>
<td>(affix: morpheme: [III: reciprocal/etc.],</td>
</tr>
<tr>
<td>morph: ( C v C v C )</td>
</tr>
<tr>
<td>(= reduplication of stem-internal V)</td>
</tr>
<tr>
<td>(target)</td>
</tr>
<tr>
<td>*IV</td>
</tr>
<tr>
<td>[ \mu [d a r a s] ]</td>
</tr>
<tr>
<td>( \mu [a] )</td>
</tr>
<tr>
<td>( [C C v C] )</td>
</tr>
<tr>
<td>( ['a]-[C C v C] )</td>
</tr>
<tr>
<td>(target)</td>
</tr>
<tr>
<td>*V</td>
</tr>
<tr>
<td>[ \mu [d a r a s] ]</td>
</tr>
<tr>
<td>( [t a] )</td>
</tr>
<tr>
<td>( d a r a s )</td>
</tr>
<tr>
<td>(base: [verb II])</td>
</tr>
<tr>
<td>(affix: morpheme: [V: passive/reflexive]</td>
</tr>
<tr>
<td>morph: ([t a]-) prefix</td>
</tr>
<tr>
<td>(target)</td>
</tr>
<tr>
<td>*VI</td>
</tr>
<tr>
<td>[ \mu [d a r a s] ]</td>
</tr>
<tr>
<td>( [t a] )</td>
</tr>
<tr>
<td>( d a r a s )</td>
</tr>
<tr>
<td>(base: [verb III])</td>
</tr>
<tr>
<td>(affix: morpheme: [VI: passive/reflexive]</td>
</tr>
<tr>
<td>morph: ([t a]-) prefix</td>
</tr>
<tr>
<td>(target)</td>
</tr>
<tr>
<td>Table 4: Continued</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
</tbody>
</table>
| **VII:**  

- $\mu [d\grave{a}ra\grave{s}]$  
  - (base: [verb II])  
  - (affix: morpheme: [VII: medio-passive])  
  - morph: $[n\text{-}]$ prefix  
  - $[n] \ d\grave{a}ra\grave{s}$  
  - (target)  

**VIII:**  

- $\mu [d\grave{a}ra\grave{s}]$  
  - (base: [verb I])  
  - (affix: morpheme: [VIII: passive/reflexive],  
    - morph: $[-t\text{-}]$ prefix)  
  - $[t] \ d\grave{a}ra\grave{s}$  
  - $-d-t-ar\grave{a}s$  
  - (target: metathesis rule $\to$ infix)  

**X**  

- $\mu [\ ?\ a\ d\grave{a}ra\grave{s}]$  
  - (base: [verb IV]) (delete prefix)  
  - (affix: morpheme: [X: reflexive/ask/consider])  
  - morph: $[-st\text{-}]$ prefix  
  - $[st\emptyset] \ a\ d\grave{a}ra\grave{s}$  
  - (target)
<table>
<thead>
<tr>
<th>*I</th>
<th>[fa’al-]</th>
<th>[(various)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>*II</td>
<td>μ [darras-]</td>
<td>(base: [perfect vb. II])</td>
</tr>
<tr>
<td></td>
<td>[ta [CCvvC] (i)]</td>
<td>(affix: [ta] - [CCvvC] - (i))</td>
</tr>
<tr>
<td></td>
<td>ta drias</td>
<td>(prefix, syll. strcut., stem vowl ablaut)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(target)</td>
</tr>
<tr>
<td>*IV</td>
<td>μ [‘adras]</td>
<td>(base: [perfect vb. IV])</td>
</tr>
<tr>
<td></td>
<td>[‘i)CCvvC]</td>
<td>(affix: m [i - ä])</td>
</tr>
<tr>
<td></td>
<td>idraas</td>
<td>(vowel pattern, syll. struc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(target)</td>
</tr>
<tr>
<td>*VII</td>
<td>μ [ndaras]</td>
<td>(base: [perfect vb. VII])</td>
</tr>
<tr>
<td></td>
<td>[CCiCvvC]</td>
<td>(affix: μ [i - ä])</td>
</tr>
<tr>
<td></td>
<td>ndiraas</td>
<td>(vowel pattern, syll. struc.)</td>
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<tr>
<td></td>
<td></td>
<td>(target)</td>
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<tr>
<td>*VIII</td>
<td>μ [-dtras]</td>
<td>(base: [perfect vb. VIII])</td>
</tr>
<tr>
<td></td>
<td>[CCiCvvC]</td>
<td>(affix: μ [i - ä])</td>
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<tr>
<td></td>
<td>dtriaas</td>
<td>(vowel pattern, syll. struc.)</td>
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<tr>
<td></td>
<td></td>
<td>(target)</td>
</tr>
<tr>
<td>*X</td>
<td>μ [stadaras]</td>
<td>(base: [perfect vb. X])</td>
</tr>
<tr>
<td></td>
<td>[CCiCvvC]</td>
<td>(affix: μ [i - ä])</td>
</tr>
<tr>
<td></td>
<td>stidraas</td>
<td>(vowel pattern, syll. struc.)</td>
</tr>
</tbody>
</table>

* Base for all = perfect stem
<p>| | | |</p>
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<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>μ [daaras-]</td>
<td>(base: [perfect vb. III])&lt;br&gt; (affix: circumfix (prefix/suffix))</td>
</tr>
<tr>
<td></td>
<td>μ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[mū] [daaras] [āt]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mudaarasat</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>μ [tadarras]</td>
<td>(base: [perfect vb. V])&lt;br&gt; (affix: stem vowel ablaut)&lt;br&gt; (target)</td>
</tr>
<tr>
<td></td>
<td>μ [tadarras] μ [(u)]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tadarrus</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>μ [tadaaras]</td>
<td>(base: [perfect vb. VI])&lt;br&gt; (affix: stem vowel ablaut)&lt;br&gt; (target)</td>
</tr>
<tr>
<td></td>
<td>μ [tadaaras] μ [(u)]</td>
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</tr>
<tr>
<td></td>
<td>tadaarus</td>
<td></td>
</tr>
</tbody>
</table>
REFERENCES


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