Contribution to a Modern Reading of Sībawayhi

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1   Introduction

The first objective of this work was to build an automatic syntactic analyser for Arabic 'respecting specificities of Arabic language'. In fact, this latter statement usually appears in Arabic Natural Language Processing literature. However, whatever the task and the language, computer engineers work with the tools and models they have at their disposal. Regarding language modeling, it always rapidly turns out that no available computational model accounts for Arabic language. But isn't this true for all natural languages? Indeed, computational existing systems work only for specific tasks or implement very little parts of linguistic theories.

If it is true that modern linguistic theories are occidental, they are, nevertheless thought to deal with language as a human faculty or a human production in general even if linguists take as examples for explaining their artefacts some specific language examples. The grail for the linguist is to find the theory which embraces the whole language phenomenon and thus the grail for mathematicians and computer scientists is to make the theory computable. In this sense, considering what Arabic linguistics may bring to the general picture is worth undertaking. Hence, 'considering the specificities of Arabic language' leads to seeking insights from Arabic linguistics which inevitably leads to Sībawayhi and the Arabic grammatical tradition (AGT). The problem is that the Arabic grammatical tradition *is not* a theory: "… AGT has not made fully explicit its underlying theoretical premises. The existence of these premises cannot however be in doubt …" (Suleiman 1999:30).

The present contribution is a reading of Sībawayhi's approach which has been developed within the corpus of the Arabic grammatical tradition, and an attempt to explicit its theoretical premises. As linguistics (or any other science) often makes use of the language of mathematics and logic to build the language of its theories, it would not be surprising, when seeking again in these disciplines, to find some new artefacts since the old ones are not satisfying. Precisely, we propose modern Mathematical Category Theory (MCT) as a theoretical foundation for the Arabic grammatical tradition. Today, Mathematical Category Theory is the theory of structures *par excellence*: it is the theory of objects and their transformations, which is not only founded on paradigmatic classification, but it is the only one which makes

a synthesis of class and order by abstracting universal properties of objects through their interactions in order to give objects positions in structures.

This way of doing seems to correspond to the way Sībawayhi and his followers deal with language structures: every language item has a position in an abstract structure in Sībawayhi's approach and the ultimate goal of the procedures of analysis is precisely to assign a position to linguistic objects in *miṯāl*s.

For the Arabic grammarians speech is a system in equilibrium, whether it is the result of a revelation from Allah, or of an agreement between men. Each and every letter, word, category, has its own place and its own rights (Versteegh 1978:261).

The present paper describes an attempt to understand this system in order to propose formal foundations. We do not aim to build here the technical apparatus of the grammatical tradition by means of the tools of Mathematical Category Theory, which is a whole proposed research program, but we shall try to explain guiding intuitions of the proposal. Some of the terminology discussed is not found in Sībawayhi's *Kitāb*, but was developed by later grammarians. We shall not distinguish between the terms introduced by Sībawayhi or by other grammarians from this tradition, since our purpose is to analyze the grammatical theory of the first grammarians before Arabic grammar was influenced by logic.

2   The Arabic Grammatical Tradition: the Heritage

When we look at the landscape of Arabic linguistics, Sībawayhi's *Kitāb* rises like a star around which all (linguistic) constellations orbit. As pointed out by Yasir Suleiman (1999b:30) on his behalf and on behalf of other scholars, modern studies of the Arabic grammatical tradition have as one of their primary concerns the reconstruction of the methodological, theoretical and epistemological foundations that are thought to have informed the Arab grammarians in their treatment of the language. In one of his papers, Carter (1973:146) points out: "The book of Sībawayhi presents a type of structuralist analysis unknown to the West until the 20th century". In the same paper, Carter remarks that "Sībawayhi's method is remarkably similar to Immediate Constituent Analysis, with which it shares both common techniques and inadequacies".

The Arabic grammatical tradition constitutes for Arabic linguistics a—perhaps sometimes heavy and unbearable but very precious—unavoidable heritage. As Suleiman (1999b:31) says, contemporary researchers who tried to