On the Architecture of Pāṇini’s Grammar*

Paul Kiparsky
Stanford University

Abstract. The descriptive technique of Pāṇini’s Asṭādhyāyī has deeply influenced modern linguistic theory and practice. But Pāṇini had no predetermined “theory of grammar”. The rich array of formal devices and categories of his analysis emerge from nothing more than rigorously making it as short as possible. I review the overall organization of his grammar, the types of rules and the categories that they apply to, and the principles which govern their application and interaction in the system. I present in outline Pāṇini’s treatment of the major topics of Sanskrit grammar: syntax, word-formation (primary and secondary derivation, compounding), nominal and verbal inflection, and phonology. The analysis reveals that central aspects of what linguistics ascribes to Universal Grammar, including levels of representation, thematic roles, and rule ordering, are motivated within the Asṭādhyāyī merely by the goal of achieving maximum compression. This finding is itself of considerable theoretical interest.

Keywords: Pāṇini, Sanskrit grammar, syntax, morphology, phonology, simplicity, thematic roles, levels of representation, rule ordering.

1 Organization of the Grammar

1.1 Introduction

Pāṇini’s grammar is universally admired for its insightful analysis of Sanskrit. In addition, some of its features have a more specialized appeal. Sanskritists prize the completeness of its descriptive coverage of the spoken standard language (bhāṣā) of Pāṇini’s time, and the often unique information it provides on Vedic, regional and even sociolinguistic usage. Theoretical linguists of all persuasions are in addition impressed by its remarkable conciseness, and by the

* This material was presented at the CIEFL conference on the Architecture of Grammar organized by K.G. Vijayakrishnan and his colleagues in Hyderabad 15-17.1.2002, and published as a little booklet on that occasion. Portions were also presented in a series of lectures at UCLA in March 2002. My thanks to the audience at these talks, as well as to Jan Houben and Gérard Huet for their thoughtful comments. I am solely responsible for any remaining errors in this revised text.

1 Whitney’s attempt to discredit Pāṇini on matters of fact was almost unanimously repudiated by Sanskritists (Bühler 1894, von Schroeder 1895, Thieme 1935). The better we come to understand Pāṇini’s rules, the more their accuracy is vindicated (see e.g. Kiparsky 1979:13.)
rigorous consistency with which it deploys its semi-formalized metalanguage, a
grammatically and lexically regimented form of Sanskrit. Empiricists like Bloom-
field also admired it for another, more specific reason, namely that it is based
on nothing but very general principles such as simplicity, without prior com-
mitments to any scheme of “universal grammar”, or so it seems, and proceeds
from a strictly synchronic perspective. Generative linguists for their part have
marveled especially at its ingenious technical devices, and at intricate system of
conventions governing rule application and rule interaction that it presupposes,
which seem to uncannily anticipate ideas of modern linguistic theory (if only
because many of them were originally borrowed from Pâñini in the first place).

This universal admiration of Pâñini poses a problem. Why do linguists who
don’t approve of each other nevertheless agree in extolling Pâñini? Each school
of linguistics seems to fashion its own portrait of Pâñini. In the following pages
I propose to reconcile the Bloomfieldian portrait of Pâñini with the generative
one by showing how the grammar’s extremely rich formal principles and them-
atic groupings of rules emerge from nothing more than rigorously requiring
the description to be as simple as possible. To this end, I discuss some of the
aspects of the Āstādhyāyī that are of particular linguistic interest. These include
insights into the organization of grammar, as well as descriptive generalizations
that either support or call into question certain contemporary theories. I will
begin with an exposition of some of the general features of the grammar and
then examine in turn its “syntax”, “morphology”, and “phonology”, on the un-
derstanding that these are themselves emergent constellations of rules rather
than predetermined components into which the description is organized.

Needless to say, this perspective compels me to be highly selective, and to set
aside a vast number of technical aspects that are crucial to a deeper under-
standing of the system. Although the text of the grammar is probably preserved rather
well, it requires interpretation. Some of the principles that determine the appli-
cation of its rules are not stated in the grammar itself, and must be inferred. A
massive commentatorial tradition is concerned with just this, offering ingenious
(and it must be said, sometimes too ingenious) criticism and justification of the
wording of Pâñini’s rules. Modern research is complementing this with a recon-
struction of Pâñini’s grammatical thinking in historical perspective, with a view
to determining the structure of the grammar through internal analysis, using ac-
tual Sanskrit usage to help settle interpretive dilemmas about the precise intent
of rules, and gleaning additional hints from phonetics, ritual, and other related ar-
eas. In this field it is unfortunately impossible to avoid controversy, and the reader
should realize that practically everything that follows is subject to challenge.

A final note of caution before we move on. The fact that Pâñini studied a single
language, with simplicity as the guiding principle of the analysis, has certain corol-
laries which must be appreciated if we are not to pass anachronistic judgments on
the grammar. Some formulations in the Āstādhyāyī reflect what we might regard
as purely notational simplifications which do not correspond to any linguistically
significant generalizations. For example, the word order of rules is usually cho-
sen so as to maximize syllabic contraction between words. Almost all the genuine