Empirical coverage vs. theoretical implications. In search of phonology in speech sound systems.

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It may be generally stated that cross-linguistically observed sound patterns follow from the organization of the speech sound systems in individual languages. The patterns involve an array of facts, including universal typological tendencies concerning segments and processes that require not only description, but also, or in fact primarily, explanation. It may also be assumed that the structure of a given sound system comprises two components, that is, phonology and phonetics, where the former is usually defined as dealing with the more abstract, formal, categorical and mental aspects of the sound system, while the latter concerns the physical or physiological and gradient aspects. While the two domains of investigation use different tools and methods they often look for answers to the same questions. This leads to the as yet unresolved issue of the relation between phonology and phonetics, and a divide which is not only scientific, but also sociological – phonologists and phoneticians often present opposite perspectives and appear to talk at cross purposes. This picture may, for example, transpire from the opposite proposals of substance-free vs. deductive substance-based phonology. On the other hand, attempts to unify the two perspectives are often characterised by ambiguity or circularity. It is commonly assumed in phonology that one of its aims is to generate phonetic forms from more abstract phonological representation via some mechanisms of phonological computation, for example, ordered phonological rules, or ranked universal constraints. The very notion of the surface form as the end product of phonological activity suggests that the phonology must be substance-based. Such models offer the advantage of fairly accurate descriptive adequacy, or one might say, empirical coverage, leaving very little to phonetics. Typically, reference to the so-called phonetic effects is restricted to phenomena which are rather marginal or escape the model's ability to express them. Thus, the boundary between phonology and phonetics in such models is set quite low, and it is determined by the empirical 'bite' of the phonological model.

On the other hand, the development of experimental methods and the phonetic theory in the last decades, which can be referred to as the Laboratory Phonology programme, has lead not only to some verification of the phonetic data used in phonological theorising, but also to feasible explanations of more and more sound patterns, which deems the purely phonological perspective merely descriptive, and often circular. The phonetic explanations concern, for example, typological tendencies in the inventories of consonants and vowels, the nature and behaviour of distinctive features and segments, as well as a number of phonetic processes, pushing the boundary between phonetics and phonology up, and leaving seemingly little to the latter. The theoretical implications of the phonetic findings for phonological models deserve a closer inspection. This necessitates new questions about the nature and the role of phonology, its mechanisms and representations, as well as the evidence for them. One should also bear in mind that unification of the two perspectives has not been entirely successful either. For example, a direct translation of phonetic findings into phonological representation and computation often entails circularity and lowers the explanatory value of such hybrid accounts. The natural question that suggests itself in this context is whether explanatory phonetic analyses could not function in their own right, without phonological formalization.

Using a typology of representative approaches to the so-called laryngeal phonology, it can be demonstrated that the apparent conflict between substance-free and substance-full views on the relation between phonology and phonetics may to a great extent be a misunderstanding. Both approaches may be correct, and no explanatory overlap between the two perspectives is necessary. Under this view, however, it is not phonetics but phonology that needs to be redefined. For example, it should be built along some basic minimalist principles, such as privativity established on the basis of systemic rather than direct phonetic evidence, acquired rather than innate, and possibly substance-free. The most plausible way of achieving this goal may, paradoxically, require taking first a phonetic perspective in order to determine the limits of phonetic explanation concerning sound patterns. Then, it is necessary to establish criteria for deciding what constitutes the linguistic evidence for phonological decisions. Most importantly, in this view of the sound system, in which phonology and phonetics are strictly separated, what looms large is the nature of the interface. Due to the nature of the substance-free representations,

phonological computation may only turn one phonological representation into another, while most of the traditional derivation from the phonological representation to the phonetic form will need to done by spell-out, or mechanisms of phonetic implementation. This requires a different perspective on production, which is a mere reversal of mechanisms established in acquisition. In this sense, phonology is not independent of the phonetics of the ambient language. It is also less obvious what it is, and whether it exists at all.

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