Comment on German

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(Unfortunately, owing to a misunderstanding by the Editor responsible (Peter Ladefoged), the illustration of German by Klaus Kohler in the *Journal* (20.1): 48-50 was presented incorrectly. Kohler writes:)

The type of German I speak, which may be called Standard German of a northern, rather than a southern variety has three voiceless dorsal fricatives: [ç], [x], and [χ]. This statement diverges from all the existing phonetic/phonological descriptions of German, except Kohler (1977), in that it recognizes a uvular fricative in addition to a palatal and a velar one. As it is based on phonetic observation, JIPA is the obvious place for it to be made more generally known to the international phonetic community. So the offer to write an illustration of the IPA for German provided me with a unique opportunity to put this small point of German phonetics right and thus to adjust the codified text book knowledge, which by setting a paradigm (Kuhn 1970) tends to become resistant to change even if it is incomplete, inadequate, or incorrect. But unfortunately, due to a misunderstanding, the facts and their phonological interpretation were not represented in the way I had intended them. I thank the Editor for being allowed to clarify the issue in this contribution.

Provided one works within a word frame and introduces morphological boundaries in the phonological analysis, the distribution of the three sounds is governed by contextual rules: [ç] occurs after front vowels and consonants as well as morpheme initially, [x] after high and mid back tense vowels, [χ] after low back vowels; after mid back lax vowels (/ʊ/ and /aʊ/) [χ] is very common (e.g. in *Bruch, Bauch*), but here [x] also occurs, depending on the degree of openness and laxness of /ʊ/. These three dorsal fricatives can thus be regarded as being allophones of one phoneme according to the distributional principle within morphemes, symbolized by the most Roman letter of the three, viz. /x/. This is the solution adopted in Kohler (1977); others have argued for a two-phoneme description on the strength of such (near) minimal pairs as *rauchen, Frauchen* (Moulton 1962; Leopold 1945; see also Moulton 1947 for a single-phoneme analysis with internal open juncture). However, in the symbolization of the phoneme comprising all three phones, /x/ cannot and does not refer to a voiceless velar fricative, because the velar place of articulation is contextually determined and thus does not contribute to the distinctive features of the phoneme /x/. What is distinctive and common to all three allophones is the dorsal articulation as against the labial one in /f/ or the apical one in /s/. This is also the definition provided for /x/ in Kohler (1977).

Problems arise when phoneme symbols have to be entered into an IPA consonant chart according to articulatory categories of place, manner, and phonation. Now the symbol in /x/ has to be allotted to a particular place of articulation, although the allophones it stands for can vary along the whole continuum of the hard and soft palate. One way out of this dilemma would be to break down the divisions between the three columns from palatal to uvular for the fricative row, but as the voiced counterpart /ʁ/ does not have the same variation, and since voiceless and voiced consonants are entered side by side, not above one another, this is not a feasible solution. The other possibility is to represent the major

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member of the phoneme, in the tradition of Daniel Jones (1962). This, of course, entails a definition of what is the major allophone. In the case of German /x/, the palatal allophone occurs in twelve, the other two in allophones in seven structural phonetic contexts, and the exclusive occurrence of [x] is limited to two, whereas [χ] occurs in five. Moreover, in a transcribed lexicon of 23,985 words, I have found 3,283 occurrences of dorsal fricatives, of which there are

74.5%	[ç]		
20.3%	[χ]	10.9%	[aχ]
		3.9%	[a:χ]
		2.4%	[ɔχ]
		1.6%	[aʊχ]
		1.5%	[ʊχ]
5.2%	[x]	3.4%	[ux], only in word elements *such*, *Tuch*, *Fluch*, *Buch*, *Kuchen*, *Wucher*
		1.8%	[ox], only in *hoch* and compounds containing it.

Even if [x] occurs after [ʊ] and [aʊ] instead of [χ], the frequency relation between the two back fricatives still shows a preponderance of [χ] over [x].

So from a structural and a statistical point of view, [ç] qualifies most and [x] least to be taken as the major allophone to represent the German phoneme /x/. But nobody seems to use the symbolization /ç/ for the single-phoneme solution. One may ask why this should be so. Undoubtedly, one reason is that within the IPA, scholars adhere to the principle of choosing symbols that are as close to Roman letters as possible, and even outside the IPA, this consideration is obviously prevalent. But it is a marginal argument and says nothing about the status of the sounds within a phonological system. The latter should be the only relevant criterion. The possible reference to the central position of [x] between [ç] and [χ] is an equally external argument. (There is, of course, also the perspective of historical sound change, which can derive [ç] from [x χ], but not vice versa, as a possible source, and much more valid criterion, for referring to the phoneme as /x/ rather than /ç/.)

Furthermore, since in an IPA transcription morphological divisions are not marked (apart from spaces for separating words in accordance with orthographic conventions), the distinction between *rauchen* ['ʁaʊxən] and *Frauchen* ['fʁaʊçən] cannot be symbolized if the single-phoneme approach is taken and only phonemic distinctions are symbolized. In both cases the notation would be the same, e.g. /x/. Thus, although the distribution of [ç], [x], and [χ] is completely predictable from context including morphological boundaries, an IPA phonemic transcription makes a different categorization mandatory in order to achieve one of the goals laid down in the IPA principles, viz. to differentiate uniquely between words: both a front and a back voiceless dorsal fricative unit have to be set up within this transcription framework. This does not affect the distribution-related phonemic analysis, but complements it by a transcription-related identification procedure. That the front unit is the palatal [ç] is undisputed. The back unit could theoretically be either [x] or [χ] with contextual backing or fronting for the complementary element, respectively. There are strong reasons that speak in favor of adopting [χ] as the back unit, from which [x] is derived:

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1. [χ] occurs in more structural slots and is more frequent than [x].

2. For German speakers and listeners, the opposition between the front and back ends of the front-to-back continuum is a psychological reality: they can produce and perceive the distinction without difficulty in any context. It thus makes sense to take the most distant values on this scale, i.e. [ç] and [χ], as the optimal opposition between the front and back production and perception units and enter them into an IPA chart of German. Of these, [ç] is quite stable, whereas the back unit varies through coarticulatory tongue position effects, with the farthest back [χ] being replaced by [x].

3. There is also the educational aspect: students and scholars have to be made aware of the existence of [χ] in German, which has been ignored in most text books, and therefore their attention has to be drawn to it specially by opposing [χ], rather than [x], to [ç]. This way cross-linguistic comparisons are also improved, as differences between, e.g. [x] in Scottish English *loch* ['lɔx] and [χ] in German *Loch* ['lɔχ] are immediately obvious from the consonant chart.

The above reflections led me to enter [ç] and [χ] into the chart, to refer to their allophonic status in a morpheme-related distributional analysis in a paragraph following the chart, to illustrate [ç] by *dich* and [χ] by *Dach*, and finally to state the distribution of these sounds in the chart in the following way:

> [ç] occurs after front vowels ...
> [χ] occurs after back vowels (e.g. ['baχ] *Bach* 'brook', ['dɔχ] *doch* 'yet'); [x] is used instead of [χ] after high and mid back tense vowels (e.g. ['bux] *Buch* 'book', ['hox] *hoch* 'high').

Unfortunately, in the editing process [χ] was replaced by [x] in the chart and in the paragraph after it, but not as an illustration in *Dach*, and the sound distribution is still reported in the order [ç], [χ], and [x], but no longer with the wording of [χ] being replaced by [x]. This means that the reader is now confused with regard to [x] and [χ] and the distribution of the three sounds is no longer derived from the chart.

I hope I have been able to rectify these inconsistencies and contributed to an elucidation of the phonetic facts and phonological representation of the voiceless dorsal fricatives in German.

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