Less is more: Contrastive diphthong dynamics represented nontemporally

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The West Upper German dialect of Swabian minimally contrasts a pair of phonemic diphthongs by their internal timing (Geumann 1997; Geumann and Hiller 1996): In one of them /öi/, the transition is earlier than in the other /ăi/. Another pair /äu aũ/ is argued by Hiller (2002) to work analogously. Direct temporal encoding could be defined phonologically (cf. Hubbard 1995) but is considered too powerful. Rather, it is here argued that the contrast is to be perceived by the listener as one of relative prominence (cf. stress, peak vs. margin, etc., as in Ewen 1995:571) among the diphthong "halves": In /öi/, the second component is more prominent, in /ăi/ the first. Likewise, Hiller (2002) argued from phonological patterning of these diphthongs that the contrast between them is represented in terms of relative prominence. It is proposed here that the observed contrast in timing serves the sole purpose of having the listener perceive /i/ as more prominent in /öi/ but /a/ as more prominent in /ăi/. The literature has pointed out some correlations between timing and prominence, such as between transition tempo and sonority (cf. Liberman et al. 1956), sonority being a measure of intrinsic prominence (Jespersen 1904:186 ff.). Extrinsic timing is the correlate of perceived contrasts in syllabicity both with consonants (as [lːː] in <police> vs. <please>) and, most relevantly, with semivowels (Catford 1977:131). The contrast in weighting between the /a/ and the /i/ parts of Swabian /öi/ and /ăi/ is articulatorily produced as weighting of timing but perceived as weighting of prominence. Conversely, its representation as prominence is produced as timing because with each possible output, the production grammar also considers its perceptual effect (method: Boersma 1998). Since [a] is more sonorous than [i], we expect the timing contrast between /öi/ and /ăi/ to be asymmetrical. This asymmetry has been confirmed by measurement of formant velocity peaks (Geumann 1997), which can be thought of as boundaries between the /a/ and /i/. The average F1 velocity peak in /öi/ occurs as early as about 30% into the entire diphthong duration, thereby counteracting the intrinsic tendency to perceive /a/ as more prominent, whereas /ăi/ has its F1 velocity peak about halfway through the entire diphthong.
