German glide formation and constraint conjunction
T. A. Hall
Indiana University

As in many languages, [i] and [j] stand in complementary distribution in German in such a way that [j] surfaces when adjacent to a vowel and [i] elsewhere (e.g. Moulton 1962). The assumption in the literature is that German requires a rule of glide formation (GF), whereby /i/ converts to [j] in the neighbourhood of vowels (e.g. Kloeke 1982, Hall 1992, Wiese 1996, Hamann 2003). In the present study I examine a context in which GF is blocked from occurring and argue that it can be accounted for most elegantly in an OT approach which requires a conjunction between two markedness constraints. This aspect of my treatment is therefore similar to the one proposed by Ito & Mester (2003), who also posit constraint conjunctions involving two markedness constraints in their treatment of coda-based processes in German. The present treatment will be argued to be superior to rule-based treatments of GF, e.g. Kloeke (1982), Hall (1992), Wiese (1996), in which the blocking environment is accounted for with ad hoc stipulations.
    Examples of German words containing pre-vocalic [j] are presented in (1):

(1)   Jacke   [jakə]   /iakə/   'jacket'
           Union   [unjoːn]   /unioːn/   'union'
           Familie   [famiːljə]   /famiːliə/   'family'

These words are analyzed below with an underlying (moraic) /i/. GF requires the ranking ONSET > MAX-µ (see Rosenthall 1994 for other languages).
    The following words contain /VOOiV/ (in 2) and /VSOiV/ (in 3). O = obstruent and S = sonorant consonant. Note that GF applies. By contrast, GF is blocked in /VOSiV/ in (4):

(2)   GF applies in /VOOiV/:
           Aktion   [aktsjoːn]   'action, campaign'
           Bestie   [bɛstjə]   'beast'
(3)   GF applies in /VSOiV/:
           Skorpion   [skɔʀpjoːn]   'scorpion'
           Celsius   [tsɛlzjʊs]   'celsius'
           Indien   [ɪndjən]   'India'
(4)   GF blocked in /VOSiV/:
           Natrium   [naːtʀiʊm]   'sodium'
           Bibliothek   [biblioteːk]   'library'
           Hafnium   [hafniʊm]   'hafnium'
           Bosnien   [bɔsniən]   'Bosnia'
           Kadmium   [katmiʊm]   'cadmium'

Thus, GF is blocked in (4) to avoid OSj. The blockage of GF cannot be attributed to the fact that /i/ is preceded by a sonorant consonant alone because GF will apply in this context (see 1). What is more, GF is not blocked in /VSSiV/ (see 5). In (5a) the first S is more sonorous than the second one. In (5b) the two sonorants are equally sonorous. (Apparently there are no words with /VSSiV/ in which the second S is more sonorous than the first, e.g. a hypothetical word like *Omlium*).

(5)   GF applies in /VSSiV/:

      a. Kalifornien   [kalifɔʀnjən]   'California'
          Vilnius   [vɪlnjʊs]   'Vilnius'
          Fermium   [fɛʀmjʊm]   'fermium'
      b. Omnium   [ɔmnjʊm]   'omnium'

My analysis relies on the markedness constraints in (6a-c) and the conjunction in (6d):

(6)   a. *$_\sigma$[CCC: Three consonants in the onset are disallowed.
       b. *$_\sigma$[CC: Two consonants in the onset are disallowed.
       c. Syllable Contact Law (SCL): In α . β the sonority of α is greater than the sonority of β.
       d. SCL & *$_\sigma$[CC

Given the ranking *$_\sigma$[CCC, SCL & *$_\sigma$[CC » ONSET » MAX-μ the blockage of GF in (4) is correct, whereas its application in (1-3, 5) is optimal. (7) is representative of all /VOSiV/ words:

(7)

/biblioteːk/	*$_\sigma$[CCC	SCL & *$_\sigma$[CC	ONSET	MAX-μ
a. [bi.bljo.teːk]	*!			*
b. [bib.lj.o.teːk]		*!		*
c. → [bi.bli.o.teːk]			*	

GF applies in (2-3, 5) because ONSET guarantees that the candidate with [i] loses out to the one with [j], e.g. [tsɛl.zjʊs] wins out over *[tsɛl.zi.ʊs]. The analysis also makes the correct prediction concerning hypothetical forms like *Omlium* (see above), in which native speakers prefer the [i] pronunciation, because the candidate with [j] (in contrast to the one with [i]) violates the conjunction SCL & *$_\sigma$[CC, i.e. [m.lj] violates both SCL and *$_\sigma$[CC.

References

Hall, T. A. 1992. *Syllable Structure and Syllable Related Processes in German.* Tübingen: Niemeyer.

Hamann, S. 2003. German glide formation functionally viewed. *ZAS Papers in Linguistics* 32: 137-154.

Ito, J. & A. Mester 2003. On the sources of opacity in OT: Coda processes in German. In: C. Fery & R. Van de Vijver (eds.) *The Syllable in Optimality Theory.* 271-303. Cambridge: CUP.

Kloeke, W. U. S. van Lessen 1982. *Deutsche Phonologie und Morphologie. Merkmale und Markiertheit.* Tübingen: Neimeyer.

Moulton, W. 1962. *The Sounds of English and German.* Chicago: Chicago University Press.

Rosenthall, S., 1994. *Vowel/Glide Alternations in a Theory of Constraint Interaction.* Ph.D. dissertation: University of Massachusetts Amherst.

Wiese, R. 1996. *The Phonology of German.* Oxford: Clarendon Press.