Two problems of 'timing'

1) Relative length of stressed and unstressed syllables:

Take the subject of the sentence: *England, Schottland und Wales trennten sich.*

Now compare it with the subject of: *England, Scotland and Wales separated.*

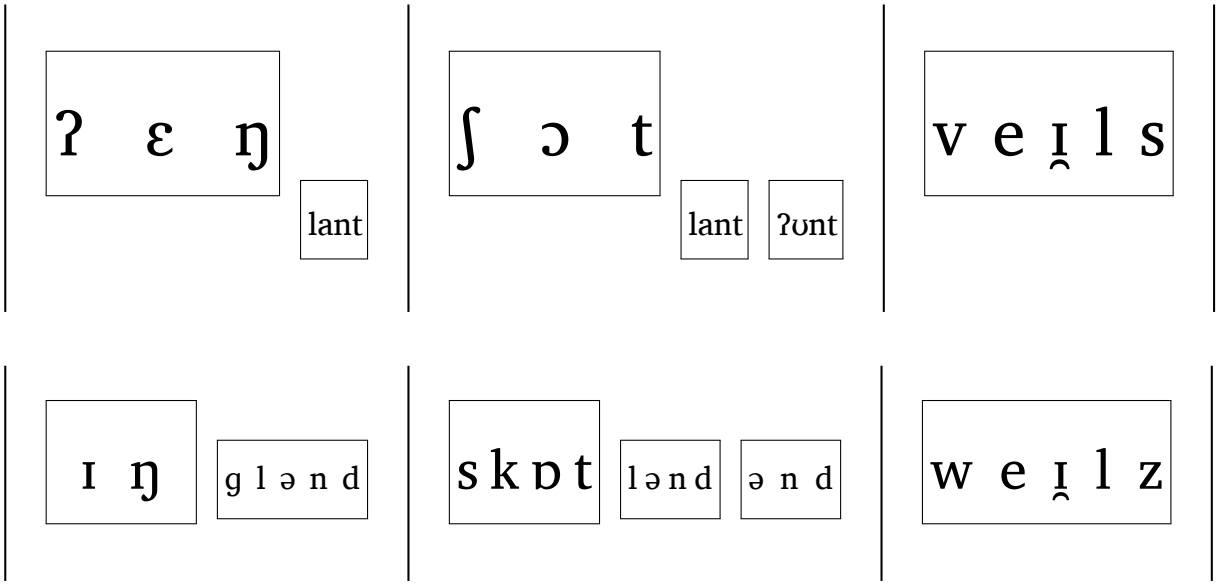
In English the unstressed syllables are longer than in German; as a result, the stressed syllables have to be shortened in order to maintain the overall rhythm (so that each foot will seem to take the same time as every other foot).

Sometimes this phenomenon is called 'rhythmic clipping'.

In the representation below, each syllable is shown as a rectangle. The width of the rectangle represents the length of the syllable, the height of the rectangle represents the loudness. A raised baseline indicates a higher pitch (Tonhöhe).

German typically has a so-called 'Sägeblatt-Intonation', with each stressed syllable being at a slightly higher pitch than the unstressed syllables following it, until the final fall (here the fall would occur on *trennten sich*).

English typically has a fairly level pitch up until the final fall (here the fall would occur on *separated*).



For more information, see:
http://www.spence.saar.de/rhythm01.pdf
http://www.spence.saar.de/rhythm02.pdf
(These pages are from: Roland ARNOLD & Klaus HANSEN, *Englische Phonetik*. Leipzig: VEB Verlag Enzyklopädie, 1988[6])

Note that the 'rhythmic units' referred to by Arnold and Hansen are not the same as 'feet', because although a rhythmic unit always contains a stressed syllable, it does not necessarily start with one. When I use vertical lines, I use them in the way they are used in music – to indicate the beginning of a new bar ('Takt').

2) Pre-fortis clipping:

In German, the distinction between fortis and lenis consonants is neutralized at the end of words, and the result is always a fortis consonant (‘Auslautverhärtung’). Thus, ⟨Quark⟩ and ⟨Sarg⟩ end up having the same final consonant sound.

In English, however, the distinction between fortis and lenis consonants is maintained at the end of words:

plosives			affricates	fricatives				
p	t	k	tʃ	f	θ	s	ʃ	← fortis
↕	↕	↕	↕	↕	↕	↕	↕	
b	d	g	dʒ	v	ð	z	ʒ	← lenis

More muscular effort is involved in producing a fortis consonant than a lenis consonant, so whenever a fortis consonant occurs in final position you start preparing for it while you are still producing the Nucleus of your syllable.

The result is that all of the Rhyme up to the beginning of the final obstruent is slightly shortened—not just the vowel or diphthong functioning as Nucleus, but any immediately following /n/ or /l/ as well. Thus, the /en/ in /bent/ ends up being pronounced slightly shorter than the /en/ in /bend/ and the /el/ in /welt/ ends up being pronounced slightly shorter than the /el/ in /weld/.

The representation below is based on measurements conducted by Wiktor Gonet & Lidia Stadnicka (‘Vowel clipping in English’, in: *Speech and Language Technology* **8**: 77–86) and reflects the fact that the length of the tense vowel [i] before a lenis consonant was approx. 300 ms, whereas the length of the tense vowel [i] before a fortis consonant was approx. 250 ms; and the length of the lax vowel [ɪ] before a lenis consonant was approx. 250 ms, whereas the length of the lax vowel [ɪ] before a fortis consonant was approx. 200 ms.

⟨bead⟩ /biːd/ [b iː d]
‘Perle’

⟨beat⟩ /biːt/ [b iˑ t] ← pre-fortis clipping
‘schlagen’

⟨bid⟩ /bɪd/ [b ɪˑ d]
‘bieten’

⟨bit⟩ /bɪt/ [b ɪ t] ← pre-fortis clipping
‘bisschen’

There is no optimal way of using the length symbols for this—some people write [iːˑ], [iː], [ɪˑ], and [ɪ], which makes it look like the vowel is being slightly stretched before a lenis consonant rather than slightly clipped before a fortis one.

If you are a native speaker of German, you are already clipping vowels before all final plosives, affricates, or fricatives, and you need to learn to stop doing it before lenis ones – so try to actually stretch the vowel somewhat in ⟨bead⟩ and ⟨bid⟩.