

Tongue-jaw coordination in diachronic vowel shifts: evidence from RT-MRI

At the latest since the seminal work of S. Wood it has been clear that a complete theory of vowel production must take explicit account of tongue-jaw coordination. Wood focused on the tense-lax opposition; in an early EMA investigation we extended the approach to include the rounding opposition: In the German pairs /i, e/, /i, I/ and /i, y/ the tongue dorsum is clearly lower in the second member of each pair. However, each pair differs characteristically in the relative contribution of the jaw to this result: greatest for /i, e/, least for /i, y/.

Using RT-MRI, recent analysis of ongoing processes in three English dialects (US, AUS, NZ) involving completely different phonological contexts from the original German ones, makes it appear timely to hammer home this message once again: the jaw does not just provide a bit of support for the tongue (and lower-lip) but has a very specific role to play in vowel articulation.

In US and AUS English the relevant process is pre-nasal raising. It is uncontroversial that the tongue dorsum is much higher in BAN vs. BAT (at least as high as BIN in US; similar to BEN in AUS). The new finding is that the low jaw position in BAT is retained in BAN. It is intriguing that this is found in two such widely separated dialects as US and AUS English.

Regarding NZ it is well-known that as part of the on-going vowel chain-shift the vowel in BET has raised and that in BIT has lowered (and probably centralized). The dorsum is now much higher in the former than the latter. However, in an interesting counterpart to the previous example, jaw height appears to have maintained the relative positions that presumably obtained before the start of the chain shift, i.e. higher for BIT than BET.

Following Wood, and later Articulatory Phonology, it has proved quite compelling to model not only consonants but also vowels in terms of concepts like Constriction Location and Constriction Degree. However, the present results make clear that such an approach (to say nothing of traditional vowel features such as high-low) is fundamentally unable to capture how speakers actually organize their articulations.

One interpretation of the sound-change processes analyzed here is that the jaw is more conservative than the tongue as these processes evolve. In conclusion, I will speculate why this is the case.