

Turbulence and voicing

Voiced fricatives in English may sometimes lose their voicing and may sometimes lose their turbulence. Examples can be seen in the two recordings (A and B) of the word “these” shown on the next page. The upper panel of each display is an audio waveform. The lower panel is an index of turbulence. For the current purposes, any value above 1000 can be considered to have turbulent flow. The recordings come from the following contexts:

- (1) THESE are the coffee beans I want... not the lame flavored ones over there.
- (2) I'm glad you stopped by to get these.

(a) For each of the two fricatives in the word “these”, fill out the table on the next page indicating whether the fricative was produced with voicing (put a check mark in the table if voiced or leave it blank if voiceless), and with turbulence (put a check mark in the table if turbulent or leave it blank otherwise).

	ð	z
A		
Voicing		✓
Turbulence	✓	✓
B		
Voicing	✓	
Turbulence		✓

(b) Which recording (A or B) corresponds to context (1) above? A

(c) How might you explain the pattern of voicing and turbulence these segments exhibit, and how could a difference in the parameters of their Tongue Tip Constriction Degree gestures account for the different patterns observed for /ð/ vs. /z/?

/z/ has a more narrow TTCD so it creates turbulent flow even when voiced. It is a true fricative.

/ð/ has a wider TTCD so it creates turbulent flow only if voiceless. It is an approximant.

