Speech perception: As abstract as it needs to be

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To understand speech, listeners have to abstract away from the phonetic diversity which talkers confront them with. But they also need to store knowledge about how individual talkers and groups of talkers speak, so that they can understand those talkers better in the future. In this talk, I will briefly summarize evidence that these two processes are supported by complementary memory systems, one which stores abstract representations of speech and one which stores episodic memories that include talker and situational details. I will then turn to a more specific question: what linguistic abstractions do listeners use? Findings will be presented from recent speech learning experiments using lexically-guided retuning and selective adaptation paradigms. These studies show that listeners use context-dependent allophonic units, rather than context-independent phonemic units, in speech recognition. I will argue that this is because tuning in to speech at the level of the allophone helps the listener understand speech, while tuning in at the level of the phoneme does not. More generally, the degree of abstraction that is required in speech recognition, about phonological content and about talkers, is what is required for listeners to be able to cope with the diversity inherent in the speech signal.