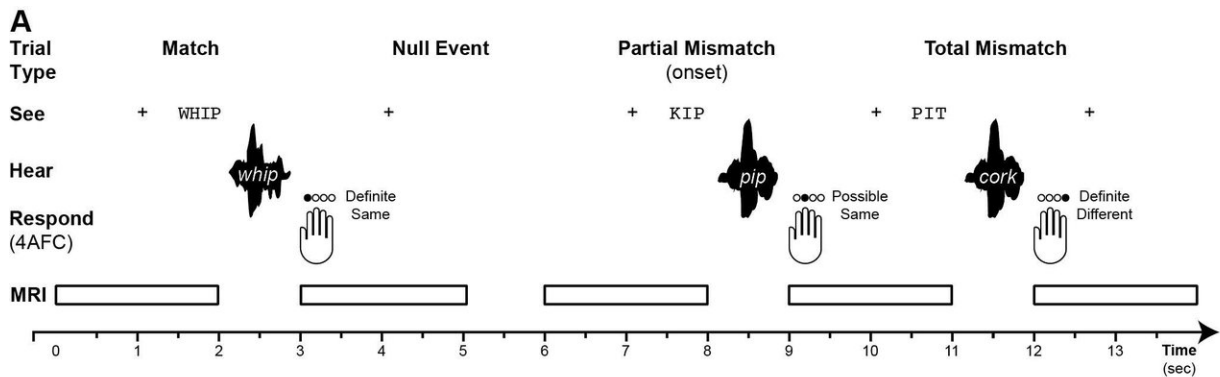


Slips of the ear: When knowledge deceives perception

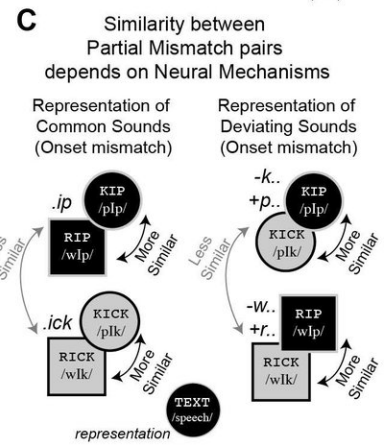
June 11 2018



B

Condition	Stimulus and Percept				Neural Mechanism	
	Prior Text	Degraded Speech	Percept	Response	Representation of Common Sounds	Representation of Deviating Sounds
Match	PIP	/pIp/	"pip"	Same	pip
Total Mismatch	WALK	/pIp/	"pip"	Different	-walk +pip
Partial Mismatch (onset)	KIP	/pIp/	"kip" "pip"	Same Different	.ip .ip	-k... +p... -k... +p...
(offset)	PICK	/pIp/	"pick" "pip"	Same Different	pi.. pi..	-..k +..p -..k +..p

Misperception → Perception → Unclear / Clear Representation



Misperception of speech results from a weak representation of the difference between what we expect to hear and what is actually said, according to a human neuroimaging study published in *JNeurosci*. The research provides new evidence for how the brain creates perceptual illusions when speech is degraded at cocktail parties, in song lyrics or for older listeners. Credit: Blank et al., *JNeurosci* (2018)

Misperception of speech results from a weak representation of the difference between what we expect to hear and what is actually said, according to a human neuroimaging study published in *JNeurosci*. The research provides new evidence for how the brain creates perceptual illusions when speech is degraded at cocktail parties, in song lyrics or for older listeners.

The ability to draw on past experience is important to keep up with a conversation, especially in noisy environments where [speech](#) sounds are hard to hear. However, these prior expectations can sometimes mislead listeners; convincing them that they heard something that a speaker did not actually say.

To investigate the neural underpinnings of speech misperception, Helen Blank, Matt Davis, and colleagues presented participants with pairs of written and degraded spoken words that were either identical, clearly different or similar-sounding. Reading and hearing similar sounding words (like kick followed by pick), led to frequent misperception.

Using [functional magnetic resonance](#) imaging the researchers found that [misperception](#) was associated with reduced activity in the left superior temporal sulcus, a brain region critical for processing speech sounds. Furthermore, when perception of speech was more successful, this brain region represented the difference between prior expectations and heard speech (like the initial k/p in kick-pick).

These results provide new evidence that speech perception involves comparing what we hear with what we expect. This mechanism—predictive coding—has implications for treating age-related hearing loss or understanding auditory hallucinations in disorders such as schizophrenia.

More information: Neural Prediction Errors Distinguish Perception

and Misperception of Speech , *JNeurosci* (2018). [DOI: 10.1523/JNEUROSCI.3258-17.2018](https://doi.org/10.1523/JNEUROSCI.3258-17.2018)

Provided by Society for Neuroscience

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