

Phonotactic Constraints in McGurk Effect

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Speech Perception

- Audio-visual phenomenon
- Usually audio and video sources are coherent
- What if information from visual channel is not coherent?

McGurk Effect

- McGurk and McDonald in 1976

- Speech Perception- Importance of visual information
- Information in audio and video channels is not coherent
- Uniqueness- Fusion is also meaningful

<i>Auditory Stimuli</i>	<i>Visual Stimuli</i>	<i>Fused Stimuli</i>
ba-ba	ga-ga	da-da
ka-ka	pa-pa	ta-ta

PHONOTACTICS

LEFT

LEFP

LEFK

MAFT

MAFP

MAFK

Phonotactic Constraints

Branch of phonology that deals with restrictions on the permissible combinations of phonemes.

- Different rules for different languages
 - /st/ is valid in English, not valid in Japanese
- Different rules for different types of phonemes
 - /ft/ is valid; /fp/ and /fk/ are not
- Rules also depend on the location inside the word.
 - Onset - /sp/ ; Ex- SPeak
 - Coda - /ps/ ; Ex- laPSe

What we are aiming at

- Study the McGurk effect occurring in words
- Introduce a bias and study its influence on McGurk effect
- Establish the importance of phonotactic constraints while perceiving spoken words

Previous Work

- Windmann discovered how sentence context and expectation affected the McGurk illusion in German language [2]
- The results proved that that the sentence context did influence the strength of the McGurk effect
- Azra N. Ali did a similar work on sentences in English, giving the same results [3]

Experimentation

- Visual clips with spoken words (Coherent and Incoherent)
- Incoherent audio-video leads to a fused word (McGurk Effect)
- Subject has to repeat the perceived word
- All the words (spoken and fused) are meaningless

Cases

- Control Cases (Coherent audio - video)
Phonotactically licensed word
Phonotactically restricted word
- Test Cases (Incoherent audio - video)
Spoken and Fused words are phonotactically licensed
Only Spoken words are phonotactically licensed
Only Fused words are phonotactically licensed

References

- [1] McGurk, H., & MacDonald, J. (1976); Hearing lips and seeing voices. Nature, 264, 746-748.
- [2] Windmann, S., "Effects of sentence context and expectation on the McGurk illusion", J. Memory and Language, Vol 50, 2004.
- [3] Ali A. N. (2007). Exploring semantic cueing effects using McGurk fusion, in Auditory-Visual Speech Processing (Hilvarenbeek: Kasteel Groenendaal)
- [4] Keren B. Shatzman & René Kager, "A role for phonotactic constraints in speech perception"; ICPHS 2007