PHONETIC ASPECTS OF “SPEECH-LAUGHS”

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Laughing and speaking

- crucial role of laughter in discourse: expression of attitudes
- expressed by multiple modalities
- unjustified frequent equation of humour and laughter
- rarely addressed as a typical phenomenon of spontaneous speech

Laughing while speaking

- speech with simultaneous laughter rarely investigated
- contradictory findings :
  - [1] suggest that laughter almost never co-occurs with speech
  - In child-mother interaction [2], up to 50% of laughs overlap with speech in conversations

Speech-laughs distinct from smiled speech?

- discussion since Darwin [3]: Differences between smiling and laughing *continous* or *categorical*?
- differences and similarities between smiling and laughing

	smiling	laughing
ontogenesis	after birth	4th/5th month
evolution	silent bared-teeth	relaxed open mouth
acoustic reflection	not necessary	necessary
neurophysiology	evoked in same brain region	
affective function	joy, happiness	
vocabulary	lächeln / sourire	lachen / rire
facial expression	retracted lip-corners	
effects on speech	higher pitch, higher formants	

Speech-laughs = laughter superimposed on speech?

- Phonetics of *isolated* laughs (see e.g. [4])
  - aspiration-vowel pattern („haha“)
  - aspiration phase longer than the vowel
  - strong influence of aspiration on vocalic portions
  - increased average pitch
  - sometimes very high intensity
  - great intra-individual variability

Study

- *KielCorpus of Spontaneous Speech*
- German language
- audio recordings of 117 appointment-making dialogues
- no backchannel utterances
- 16 dialogue sittings (7 dialogues with same speakers)
- hand-labelled by phoneticians

How often do speakers in dialogues laugh *during* speech and *separated* from speech?

- 60% of all labelled laughs are speech-laughs
- absence of laughter only in 3 out of 16 dialogue sittings
- laugter in *each* of the six dialogues with unknown partners

Can we find indications for a continuum from smiling to laughing?

Motivation:
- some labelled speech-laughs perceived as "smiles”

Experiment:
- perception test with all 49 phrases containing speech-laughs
- bipolar 7-point scale with "smile" and "laugh" at the ends
- 10 listeners

Results:
- some examples of labelled laughter not recognised as such
- some tokens were localised more towards the smile pole
- 10 tokens categorised neither as smiles nor laughs by two or more judges
- some listeners prefer two distinct categories

Summary:
- hypothesised acoustic smile-laugh continuum rejected
- possibly different intensity scales for smiles on the one hand and for speech-laughs on the other hand

How can speech-laugh patterns be described with its phonetic characteristics?

Analysis:
- 11 best-scored speech-laugh tokens analysed

Respiration:
- reinforced expiratory activity
- increased harmonic noise during voiced portions (breathy voice quality)
- stronger aspiration during unvoiced portions

Phonation:
- occasionally a tremor (or vibrato) in voiced segments
- pitch can be increased by a pure smiling or by a potential blending with smiling

Timing:
- speech-laugh is expanded over two syllables irrelevant of word length
- laughed speech short-term, smiled speech possibly long-term event
- speech-laughs start or end simultaneously with articulation
- three of them followed by isolated laugh

Summary:
- articulatory configurations for speaking continuously maintained
- speech-laughs not simply laughter superimposed on articulation

Discussion

- laughter not exclusively occurs in its autonomous form, but to a substantial degree simultaneously with speech
- no support for the idea of an acoustic smile-laugh continuum
- relation between laughed speech and smiled speech remains unclear
- speech-laughs not simply laughter superimposed on articulation
- no prototypical pattern for speech-laughs
- great variability between and within speakers
- complex interplay between smiling, laughing and speaking
- important for describing affective speech: simultaneous or separated use of the articulation channel by speech and laughter

References

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