

# Stem-, Spraak- en Taalpathologie

## 13th International Science of Aphasia Conference

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# AN EXPERIMENTAL STUDY ON THE INFLUENCE OF CONGENITAL AMUSIA ON SPEECH PERCEPTION

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## Introduction

Congenital Amusia is a neuro-developmental disorder that has a negative influence on pitch perception (Peretz et al. 2002, Foxtan et al. 2004, Stewart 2008). It is not caused by insufficient exposure to music, a hearing deficiency, brain damage or intellectual impairment (e.g., Ayotte et al. 2002). Congenital amusics face lifelong impairments in the musical domain and their symptoms can be so severe that music sounds like ‘banging’ to them (Stewart 2008: 127). They have deficits in fine-grained pitch discrimination, i.e. they cannot detect that two adjacent tones are different in pitch if the difference is one semitone or less (Peretz et al. 2002; Foxtan et al. 2004).

What makes this condition so particularly interesting is that there is an ongoing debate whether language is affected (cf. Patel et al. 2008, Liu et al. 2010) or not (cf. Ayotte et al. 2002, Hutchins et al. 2010). It has long been argued that congenital amusia is domain-specific to music and does not affect language (e.g. Peretz et al. 2002). However, growing evidence suggests that this view has to be reconsidered (Patel et al. 2008, Liu et al. 2010) and that congenital amusia influences linguistic pitch perception (intonation). Contrasting findings and different hypotheses of what the underlying cause of congenital amusia might be – a fine-grained pitch processing deficit (Ayotte et al. 2010) or a memory deficit for non-verbal sequences (Tillmann et al. 2009) – warrant further investigation.

The most fundamental issue that needs to be investigated is whether and how speech perception is affected by congenital amusia. If speech perception is affected, then it is also important to investigate which acoustic or linguistic factors may influence amusics’ speech perception.

## Methods

### *Participants & Design*

We tested eight German amusics (diagnosed with the MBEA: Ayotte et al. 2002) and 32 matched controls in a same-different discrimination task.

### *Stimuli*

The present pilot study examined the discrimination of linguistic pitch and two types of tonal analogs (sine tones and pulses) by amusics. We tested

whether the amusic group was at a disadvantage when linguistic material was removed in the sine tones and pulses. In addition, we looked at the influence of stimulus duration and continuity of the pitch. Spoken statement-question pairs were used to create our stimuli. The phonemic material (continuous and discontinuous sounds) and the duration of the sentences were varied. The final pitch contours were manipulated in steps of seven semitones. For questions, the pitch was changed downwards towards a statement intonation; for statements upwards towards a question. For each sentence we created tone analogues consisting either of simple sine tones or of complex tones (pulses). Participants had to compare stimulus pairs from the same condition (e.g., sine sounds from the long question intonation with discontinuous sounds).

## Results

First results show that both groups performed worst for sine stimuli compared to voice stimuli and pulses, while non-amusics performed best for pulse stimuli, amusics showed an advantage in the linguistic stimuli. However, amusics performed worse over all conditions than non-amusics, even for stimuli pairs that differed in seven semitones. These results show that congenital amusia also affects speech perception.

## References

- Ayotte, J., Peretz, I., & Hyde, K. (2002). Congenital amusia – A group study of adults afflicted with a music-specific disorder. *Brain*, 125, 238-251.
- Foxton, J. M., Dean, J. L., Gee, R., Peretz, I., & Griffiths, T., D. (2004). Characterization of deficits in pitch perception underlying “tone deafness”. *Brain*, 127, 801-810.
- Hutchins, S., Gosselin, N., & Peretz, I. (2010). Identification of changes along a continuum of speech intonation is impaired in congenital amusia. *Frontiers in Psychology*, 1.
- Liu, F., Patel, A. D., Fourcin, A., & Stewart, L. (2010). Intonation processing in congenital amusia: discrimination, identification and imitation. *Brain*, 133(6), 1682-1693.
- Patel, A., Wong, M., Foxton, J., Lochy, A., & Peretz, I. (2008). Speech intonation perception deficits in musical tone deafness (congenital amusia). *Music Perception*, 25, 357-368.
- Peretz, I., Ayotte, J., Zatorre, R., Mehler, J., Ahad, P., Penhune, V. (2002). Congenital Amusia: A Disorder of Fine-Grained Pitch Discrimination. *Neuron*, 33, 185-191.
- Stewart, L. (2008). Fractionating the musical mind: insights from congenital amusia. *Current Opinion in Neurobiology*, 18, 127-130.
- Tillmann, B., Schulze, K., & Foxton, J. M. (2009). Congenital amusia: A short-term memory deficit for non-verbal, but not verbal sounds. *Brain and Cognition*, 71(3).