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# HARD AT HEARING

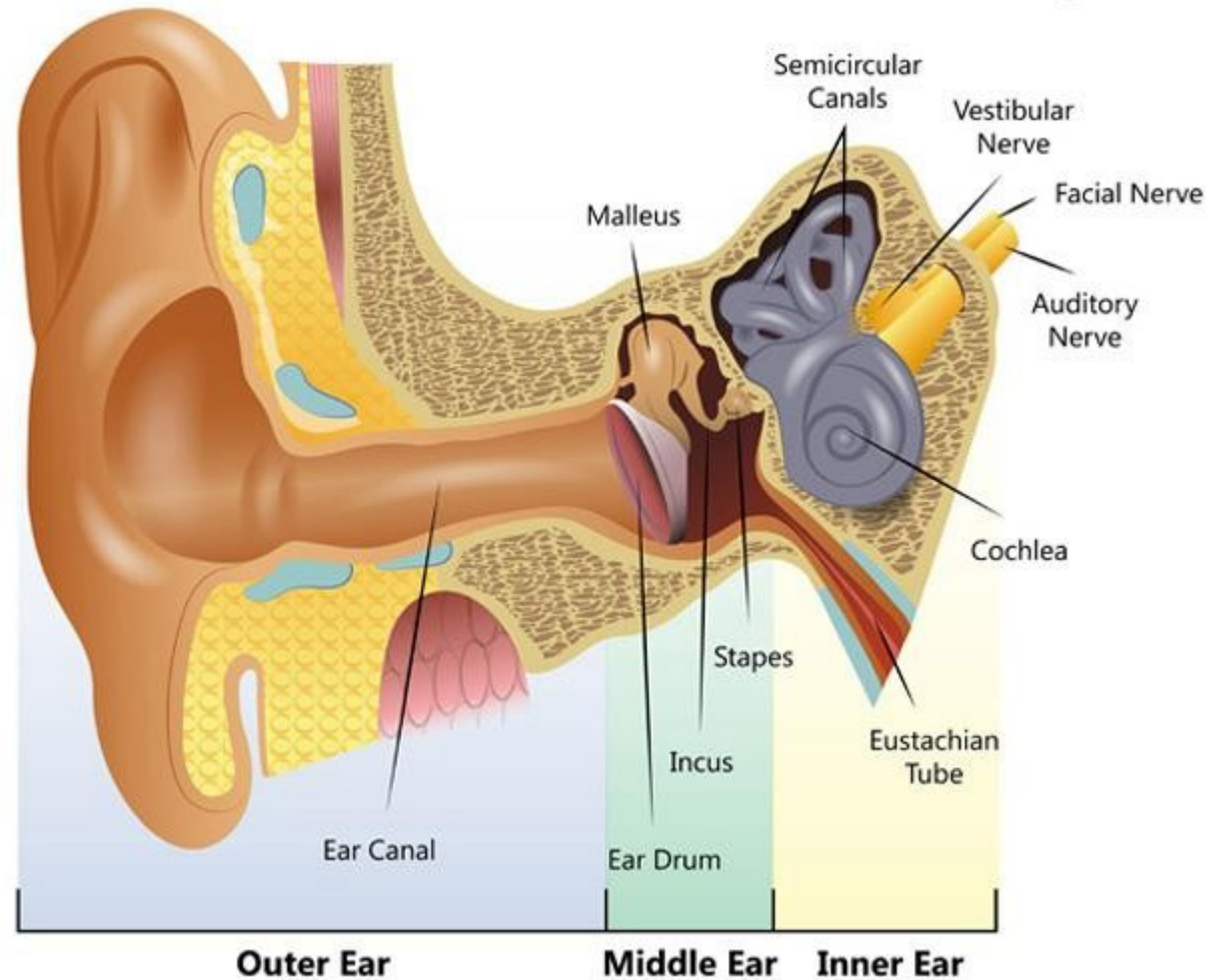
at the workplace

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# PERIPHERAL HEARING SYSTEM



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# DIFFERENCE: HEARING – UNDERSTANDING

- Hearing = auditorial processing, Understanding = (learned) skill of the auditory cortex
- Only by constant hearing of language, music and sounds we can identify, remember and understand auditory information; when something is heard and sent to the brain, it can be recognized, processed and therefore be understood
- => the more often a word is heard, the better it can be understood (Known problems: rare words, loanword, proper nouns, foreign languages...)
- Each word has a characteristic acoustic pattern, which is used to recognize it (Known problems: bad pronunciation)

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# OPTICAL EXAMPLE: UNDERSTANDING LANGUAGE

o o a e  
i i i e  
a o a e

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# OPTICAL EXAMPLE: UNDERSTANDING LANGUAGE

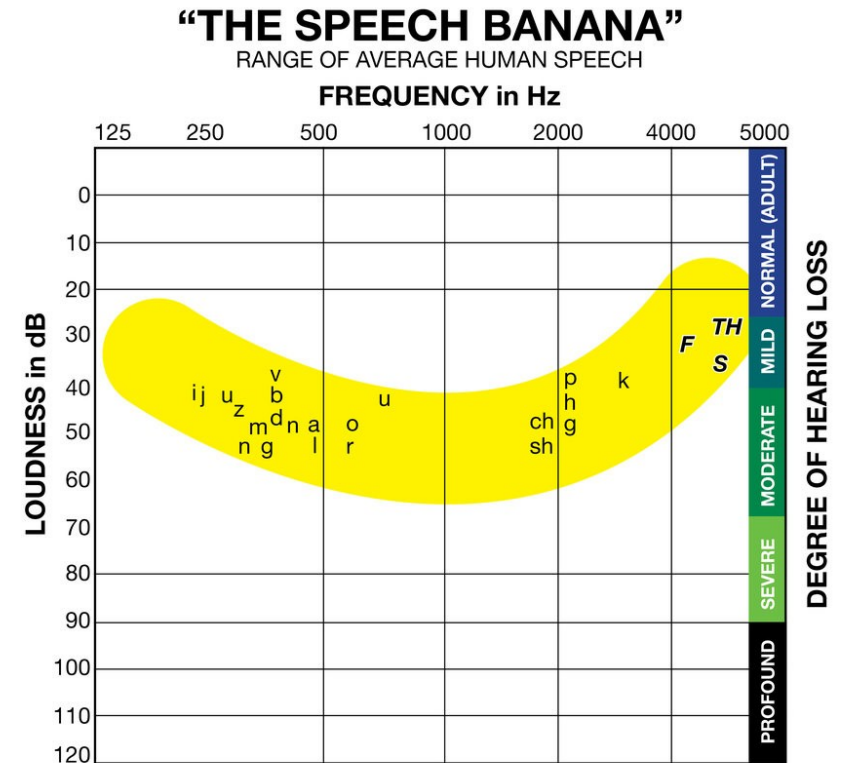
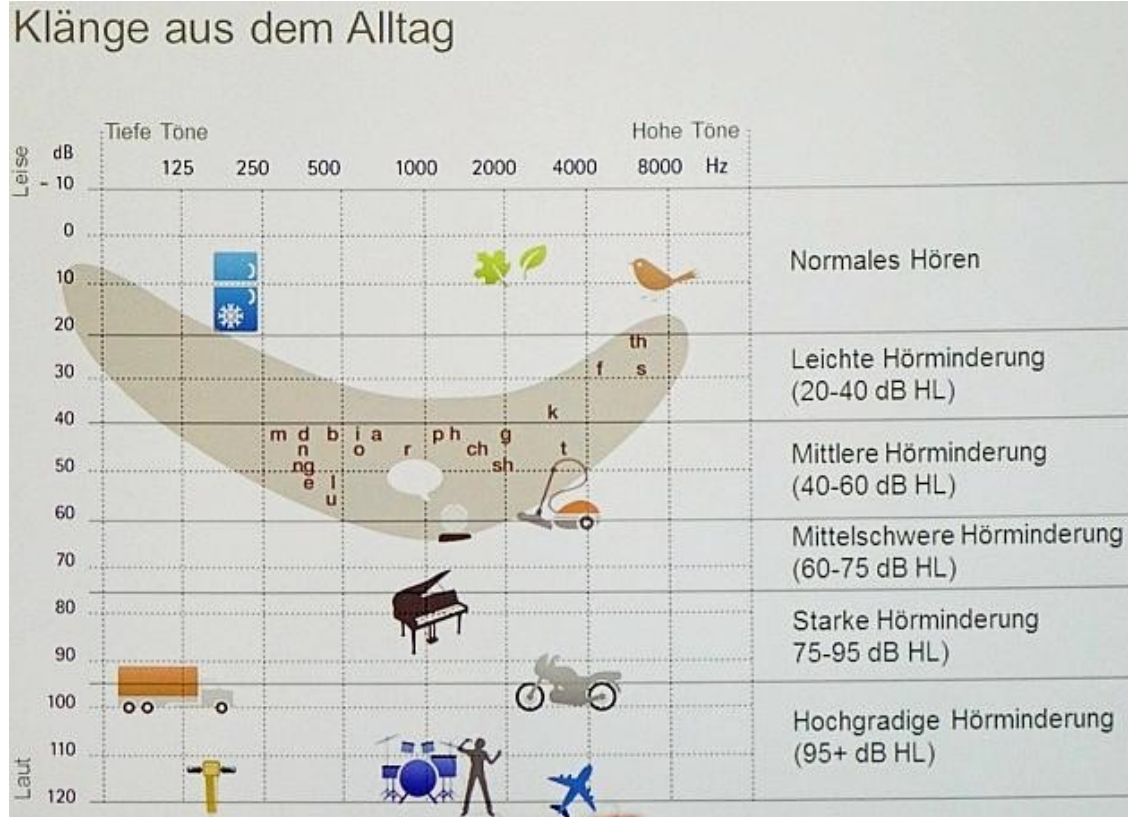
**K ns n nt n**  
**s nd w cht g r**  
**ls V k l**

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OPTICAL EXAMPLE: UNDERSTANDING  
LANGUAGE

**Konsonanten  
sind wichtiger  
als Vokale**

# SPEECH BANANA



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# OPTICAL EXAMPLE: UNDERSTANDING LANGUAGE

Genitiv ins Wasser, weil es dativ ist.

Geh nie tief ins Wasser, weil es da tief ist.



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# OPTICAL EXAMPLE: UNDERSTANDING LANGUAGE

His bowl is empty. Who was the cereal killer?

His bowl is empty. Who was the serial killer?

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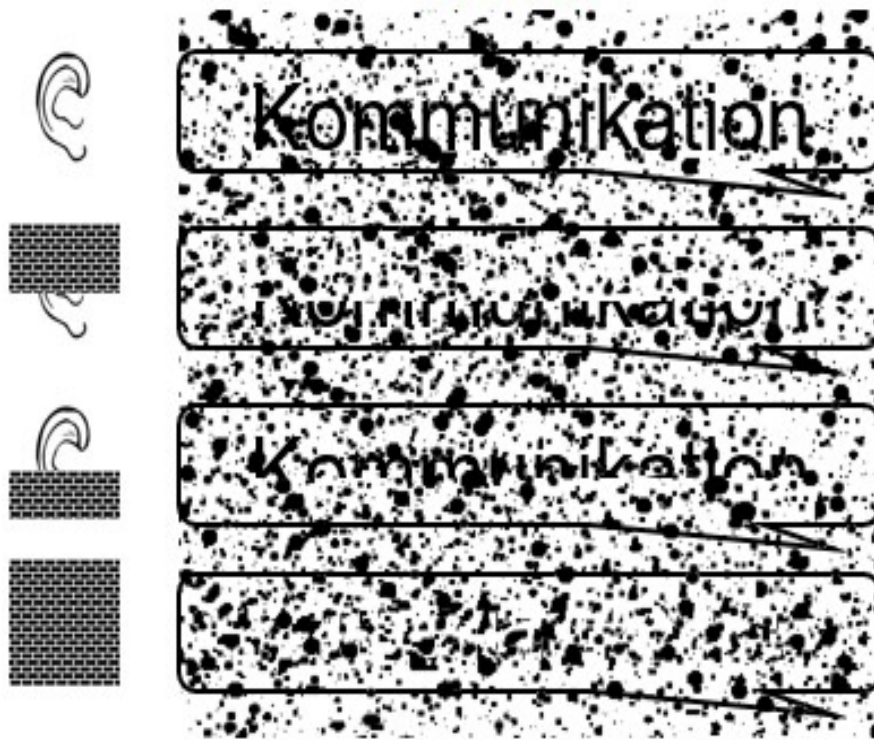
# OPTICAL EXAMPLE: UNDERSTANDING LANGUAGE

Which celebrity is always ready for cereal?

Reese, with her spoon.

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# HEARING AND UNDERSTANDING UNDER NOISE



- The deaf und CI-Carriers can not suppress noise as good as the non-disabled.
- For CI: Speech-processor can not differentiate between important and unimportant > CI-Carriers and SSDs often hear both sounds at once.
- (= monaural hearing / PUHL)

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# CONSEQUENCES OF BEING DEAF

- Misunderstanding by hearing mistake (similar words / prosody)
- Environmental sounds and noise (many voices, soundscape, large rooms)
- Ambient noise (riot) von useful noise (language) hard to differentiate
- Language (indistinct, faint, dialect, speaker far away)
- Lip movement (hidden, distorted, bad, turned away, upper limit low (max. 1/3))
- Hyperacusis (a paradox)
- Non-expressive body language (gestures/facial expressions)
- Reasoning powers / combination skills

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# COMBINING AND UNDERSTANDING

The hard at hearing are hard at collecting

- What is heard
- What can be lipread
- Body language
- Knowledge about situation / persons (context) > lexicon
- Reasonable combination of previous social experiences > social competence

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All this material is collected, to fill gaps, when the audible information is not enough > continuously-running operation

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# CHALLENGE AND PERFORMANCE OF REASONING/UNDERSTANDING

- Very high mental load (Multi-Tasking), comparable
  - Crossword puzzling ,on the side' all day
  - Combinatorial skills
  - Similar to a lively group one is part of where the language is foreign

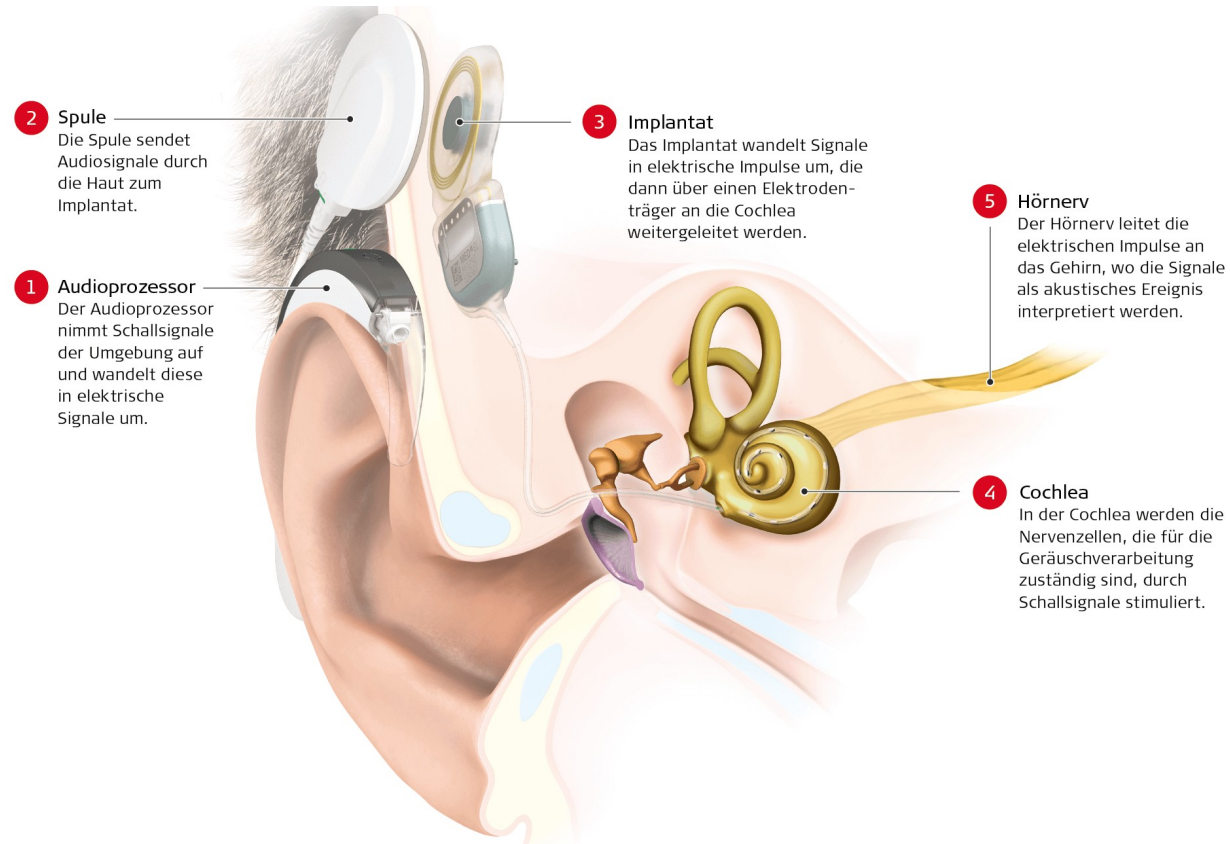


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# CHALLENGE AND PERFORMANCE OF REASONING/UNDERSTANDING

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  - Similar to a lively group one is part of where the language is foreign
- Loop: Concentration > Immense combinatorial load (stress) > performance (is limited) > exhaustion / overburdening > concentration drops > combinatorial skills drop ...

# SETUP OF A COCHLEAR IMPLANT



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# HEARING EXAMPLES OF THE CI (IN GERMAN)



Hörsimulation mit CI



Original

A hearing impression of a CI carrier

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# WHAT YOU CAN DO FOR YOUR FAMILY, COLLEAGUES AND YOURSELF

- Good lighting
- Calm/silent environment
- Good seating
- Good lip movement
- Clear language and eye contact
- Good loudness
- Make eye contact before speaking
- Important information in written form
- Good communication hygiene
- Use FM system, speech-to-text services

## **Video Conferences**

- Everybody is on mute (except speaker)
- Important infos -> Chat !!!
- Questions in chat (to not interrupt flow)
- Short answers to be noted in chat or
- Order of answers/answering noted in chat
- Keep the meetings short
  - Agendas
  - Minutes