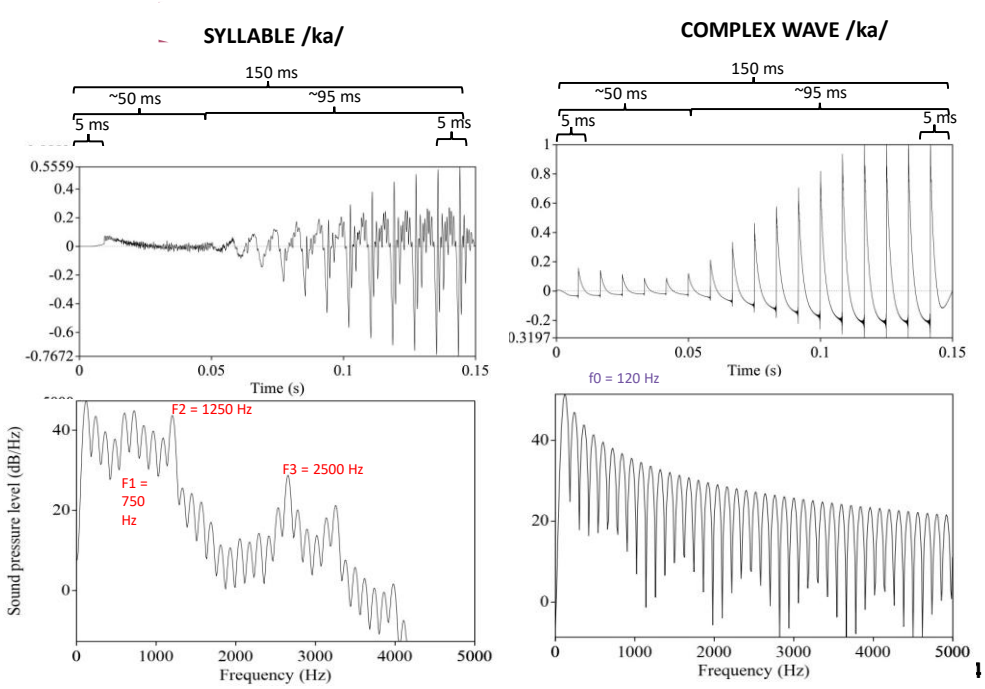
- Syllables were generated in VocaltractLab using the new glottal model (https://www.isca-speech.org/archive/Interspeech_2019/pdfs/2410.pdf).
    - /ti/
    - /tu/
    - /tə/
    - /ka/
- Syllables were adjusted on Praat to a total length of 150 ms:
    - Approx. 50 ms burst period to mark the consonant
    - Approx. 95 ms vowel
    - 5 ms rise and fall times
    - Normalised using SoundForgePro, version 3.0 for Mac OSX.
    - Intensity envelopes of three different speech syllables used as the standards /ti tu tə/ and for the one deviant /ka/ were used to transfer the amplitude-over-time information onto the generated complex waveform. This resulted in four different complex waveforms with differing amplitude envelopes, each with a specific syllabic speech amplitude distribution but no linguistic content.



- 1000 tokens were presented auditorily in total, with 900 standards and 100 deviants in a classic oddball paradigm that is typically used to elicit the Mismatch Negativity (MMN).
    - The standards were of three types, syllables /ti, tu, tə/, programmed to present at an equal proportion (300:300:300). Deviant was of one type, /ka/
    - Both standards and deviants were presented at an SOA of 650 ms

- Stimuli was pseudo-randomised before presentation with the following parameters:
  - Minimum 15 standards presented at start of block
  - Minimum 2 standards have to be presented in a row
  - Maximum 4 standards in a row.
  - (These parameters were set and tested to observe the most balanced presentation of standards:deviants. Every run-through had a different order of stimuli presented, and it may or may not follow these strict randomisation restrictions, depending on the number of stim. These parameters ensured that the standards and deviants were presented in alternation up until the designated end of the experiment, without either type of token being front-loaded during stimuli presentation)

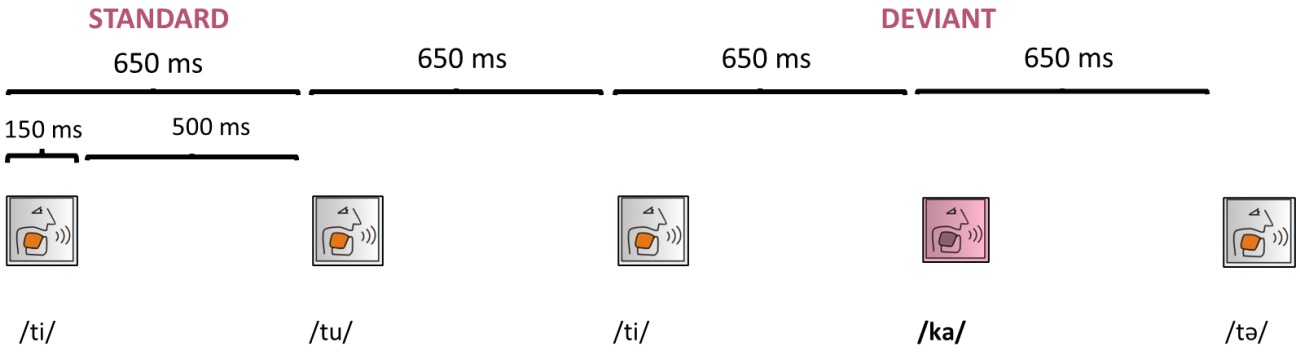


Figure demonstrates stimuli presentation during the auditory oddball paradigm. Participants heard either synthesised syllables or complex waves, presented at a rate of 650 ms. Responses to the STANDARD were compared to that of the DEVIANT in order to calculate the difference wave for the MMN. The MMN waveforms elicited to the complex waves and the syllables were then compared in order to evaluate the effect of linguistic complexity on pre-attentive auditory processing.