1pSC4. The Perception of Rate Induced Resyllabification in English

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Main Points

* The paper replicates Sonesson’s perceptual observation of rate-induced resyllabification
* Codes repeated at fast rates > Onsets
* Naïve listeners perceive it
* The perception is robust to voicing contrasts and stimulus editing techniques
* However ... is not entirely categorical: fast rate items are perceived somewhere between the two syllabification types
* Acoustic correlates of syllable affiliation suggest that listeners rely heavily on indicators of juncture. Fast repetition largely removes these indicators

Introduction

* Early articulatory work
* Repaired VC forms (such as ‘grep’) at fast rates
* Genes perceived as CV (such as ‘par’)
* Replication by Tuller & Kelso (1991)

Stimulation and the rate-dependant

* Repaired codes become similar to onsets at fast rates
* Repaired onsets also become similar to codas at fast rates
* Both onsets and codas are perceived as CVs at fast rates
* Rate scaling affects onset temporal structure proportionally, while codas temporal structure is resistant to changes
* Phonemic perception of the consonant also restricts how coda temporal structure is changed

Stimuli

* Repetition rate controlled with a metronome, start slow (450 ms/cycle), and increase throughout trial to 260 ms/cycle)
* Production rates range across syllable production range from 260 to 320 cycles/sec as found in Nelson et al. (1996)
* Production of four items

Experiments

Experiment 1: Open-set labeling

Procedure
* Present stimuli from beginning and end of trials
* 22 Listeners
* Open licensing environment, subjects run as a group
* Ask to write down the repeated syllable

Results
* 72% of responses were one of the intended syllables
* 28% of responses split consonant into two consonants
* Response showed rate (resyllabification of codas) or CVC formation
* Intended -> 7.0% of % occlusion -> 18.9% of % occlusion

Experiment 2: Closed-set perception

Procedure
* Present 50% three-syllable stimuli singly over headphones
* 18 Listeners from 12 population
* 4 choice identification with confidence rating as below

Results: Identification shifts
* Average identification functions for voiceless consonants

Experiment 3: Stimulus Transients

Procedure
* To see this, new stimuli were obtained from slow transients
* Stimuli were presented to 18 listeners

Results
* Results indicate no appreciable difference
* Proportion of Onset Responses for each stimulus in first set (with transients) was compared against matched stimuli in second set (without transients)
* Proportion of Onset Responses correlate linearly with intended onsets or codas

Predictors of Perceived Syllabification

Experiments

CONTROL VARIABLES

SLOW RATES: 30% of total stimulus structure are present
FALLING: 30% of total stimulus structure are present
ACOUSTIC MEASURES

Absolute measures of the following taken from the literature
* Duration of the syllable
* Fundamental frequency of the syllable
* Duration of segments expressed in various proportions

Results
* Results indicate no appreciable difference
* Proportion of Onset Responses for each stimulus in first set (with transients) was compared against matched stimuli in second set (without transients)
* Proportion of Onset Responses correlate linearly with intended onsets or codas

Procedure
* Rate correlates with some measures only at the fast rates
* Acoustic measures account for perception of syllables

Correlates of Syllable Affiliation

EFFECT OF RATE

LOW RATES

SLOW RATES: 90% of total stimulus structure are present
FALLING: 65% of total stimulus structure are present
ACOUSTIC MEASURES

Relative measures of stimulus structure taken from literature
* Duration of the syllable
* Fundamental frequency of the syllable
* Duration of segments expressed in various proportions

Results
* Results indicate no appreciable difference
* Acoustic measures account for perception of syllables

Procedure
* Rate correlates with some measures only at the fast rates
* Acoustic measures account for perception of syllables

References Cited


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