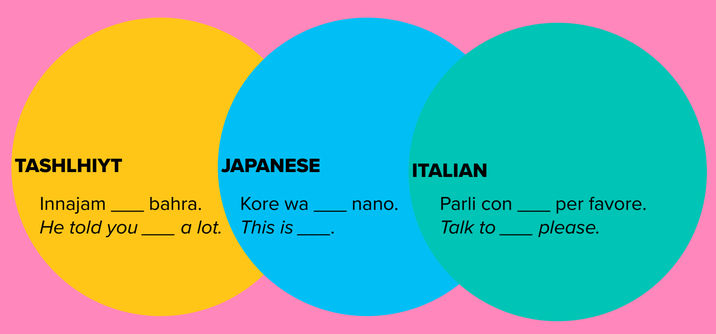
NONLINEAR EFFECTS OF SPEECH RATE ON ARTICULATORY TIMING IN SINGLETONS AND GEMINATES

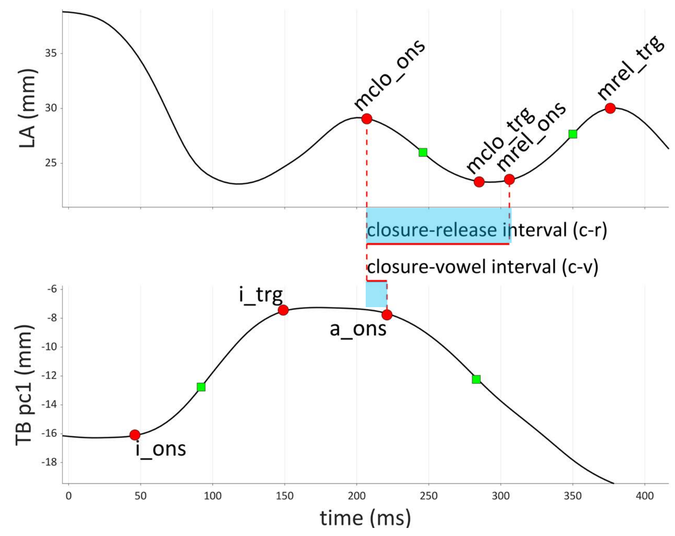
SAM TILSEN & ANNE HERMES

HOW DOES ARTICULATORY TIMING IN SINGLETONS AND GEMINATES VARY AS A FUNCTION OF SPEECH RATE?

/ima/ vs. /imma/



ARTICULATORY MEASURES



METHOD

EMA recordings

Speech rate manipulation

eliciting continuous variation in rate, by visual analog cue (20-step continuum of rates)

instructions to produce the phrases at the pace that reflected the speed of the moving red box, after it moved off the screen

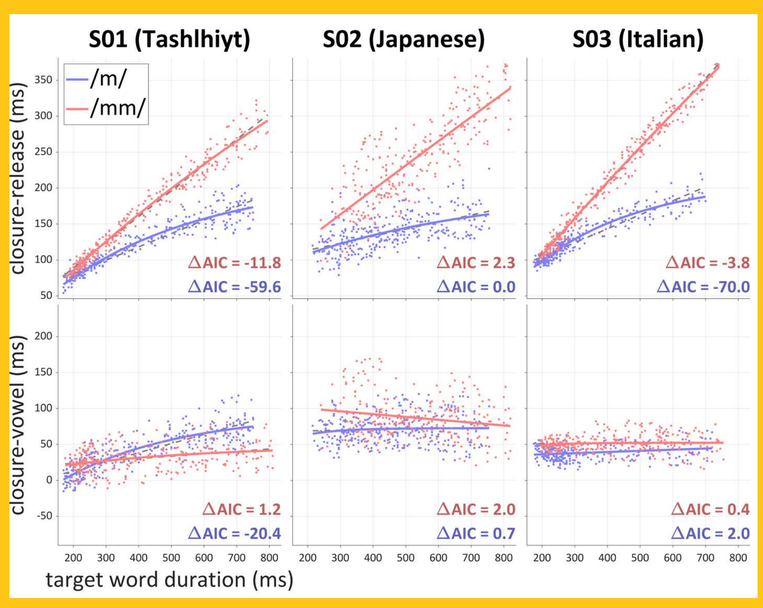
—> allows characterization of relations between rate and timing

each speaker performed 32 blocks of 20 trials over two sessions (16 blocks per session), resulting in a total of 320 repetitions of each target word (640 trials)

exponential and linear model fits for variables across target word duration (x-axis)

C-R INTERVAL

C-V INTERVAL

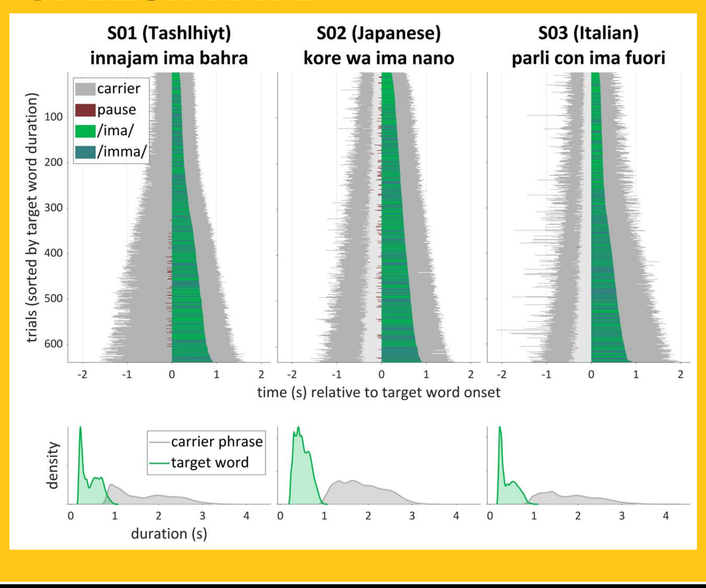


c-r interval increases linearly with rate in geminates, but nonlinearly for singletons

c-v interval remains relatively constant over speech rate manipulation in singletons and geminates

initiations of C closure and release initiations approx. symmetrically displaced from V gesture initiation in singletons, but not in geminates

SPEECH RATE



instructions for speech rate manipulation where successful

target word durations (green) and carrier phrase durations (grey) relatively uniform and spanning a wide range

—> (95% density intervals spanned 2.07 s, 1.74 s, and 2.09 s)

CONCLUSION

c-v interval was relatively constant for both singletons and geminates
—> precise, coordinative control

c-r interval (initiation of closure and release) are coordinatively controlled in singletons, but not in geminates

both intervals appear to be constrained in singletons in a way that it is not in geminates

a possible model to account for this is the competitive control model of selection-coordination theory (Tilsen 2016, 2017), in which gestural activation intervals can be controlled via sensory feedback thresholds

TIMING CONTROL MECHANISMS FOR BOTH SINGLETONS AND GEMINATES ARE RATE-DEPENDENT

TIMING OF CONSTRICTION GESTURES IN SINGLETONS AND GEMINATES CANNOT BE GOVERNED BY A MONOLITHIC CONTROL MECHANISM