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Timing Comparisons Across American Sign Language And English

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American Sign Language (ASL) and spoken English differ in modalities, but prosody can be found in both. Previous studies show that the Closure Positive Shift (CPS) (an established component of an Event-Related Potential (ERP)) occurs in response to acoustic stimuli indicative of prosodic phrasing (Pannekamp et al., 2005; Steinhauer et al., 1999). Prosodic processing in relation to these two modalities was studied using EEG. Sixteen Deaf ASL speakers and 34 hearing English speakers participated in the study by watching video or listening to audio recordings of stimuli while a portable EEG system recorded the EEG activity. We expect similar findings across modalities, indicating that the CPS occurs in the brain activity recorded irrespective of modality.

The timing data for the English stimuli has been collected and results as seen in Table 1 below indicate that there is a significant pause detected after the target phrase boundary.

Table 1: English data

	Latency to onset of Target	Duration of Target	Silence after Target	Latency to onset of complement	Duration of complement	Silence after Complement
Early Boundary	1047ms	582ms	275ms	2154ms	354ms	0ms
Late Boundary	1605ms	551ms	278ms	1044ms	345ms	0ms

ASL data was analyzed using ELAN, an annotation/transcription program, marking the timing for the entire sentence, the critical word, the pause, and the complement. We expect data to be similar across modalities. In English, prosodic pauses are marked by silence, whereas in ASL, the prosodic pause is conveyed by holding the last hand shape of the last sign before proceeding to the next sign in the utterance. The preliminary ASL data are shown in Table 2 below.

Table 2: Preliminary ASL data

	Latency to onset of Target	Duration of Target	Silence after Target	Latency to onset of complement	Duration of complement	Silence after Complement
Early Boundary	1999.5ms	856ms	356.5ms	3217ms	1314ms	70ms
Late Boundary	2918ms	919.5ms	308ms	4144ms	681.5ms	23ms

ELAN (Version 6.0) [Computer software]. (2020). Nijmegen: Max Planck Institute for Psycholinguistics. Retrieved from <https://archive.mpi.nl/tla/elan>

We see a similar pattern between the word and the prosodic boundary marker. There is a noted pause after the target word. ASL differs in that there is a durational pause noted after the complement, which may be an artifact of the modality. However, the prosodic boundary marker is not a manifestation of modality, as it shows up in recorded brain activity in both English and ASL.