Pause and hold in LSF: how to control one's gestural fluency?

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The study of the prosody of sign languages (SL) is a field that remains little explored and there is not always consensus on its main principles. Like Boyes-Braem (1999), Wilbur and Malaia (2018), among others, we consider that the prosody of LS is based on three parameters: the duration, amplitude and velocity of the movements of the manual *and non-manual* articulators involved in the production of SL. The pause, a prosodic phenomenon widely described in spoken languages, is also observed in SL; it can cover a range of values from the "silent pause" (a total absence of movement), to the "filled pause" (of a gesturality that carries little meaning), through various forms of "holding" (involving the cessation of movement of certain segments). More precisely, it can come in the following forms: (i) a return of the body to a resting position (Nicodemus & Smith, 2006; Brentari et al, 2011), (ii) a hold of either the handshape (Grosjean and Lane, 1977) or the hand location, (iii) a movement reduplication (Michit, 2020), (iv) pauses filled with self-contact gestures (Michit, 2020) or "fingers wiggling" (Nicodemus and Smith, 2006). These prosodic cues interact with what we call "shared gestures" (gestures both signers *and* non-signers use, such as beat gestures and emblems like palm-up that underline prosodic boundaries (Michit 2020). Moreover, Michit (2020) indicates that these pauses in LSF can have several functions, similar to pauses in spoken French: a structural function (acting as a boundary between two phrasal units, two groups of meanings, two ideas), an interactional function (indicating, for instance, that one is giving the floor to the addressee) and a lexical retrieval or speech planning function.

In this study, we questioned the form that prosodic pauses could take and the potential variation of their functions in a case in which sign fluency is potentially specific, either due to a register issue (poetic vs. non-poetic) or a physiological issue (old age). To this end, we examined data (a) where non-significant transitions are avoided and the duration of silent pauses is relatively reduced to create an overall continuous flow effect (Klima & Bellugi 1976; Blondel, 2000; Sutton-Spence, 2008 a. o.): poetry in LSF), and (b) where the signers must adjust the amplitude of the movements, the mobilization of the different articulators and thus their signing rate, according to the physiological constraints linked to age: utterances produced by elderly signers.

To conduct this research, we collected a corpus composed of 11 poems (Catteau, 2020) and a corpus of 13 recordings of 6-minute discussions between an elderly signer (65+ years old deaf) and a known interviewer (deaf) of the participant (Blondel *et al*., 2022). All data were collected with a regular video camera and motion capture devices using inertial sensors (composed of a gyroscope, a magnetometer and an accelerometer) (Figure 1 and 2). The use of motion capture and measurements obtained in the form of curves allowed us to identify in the gestural flow: (a) held movements (b) breaks in the fluency of movement.

Our first observations show that in poetry, we do not detect any "return of the body to a resting position" type pauses, but hold hand movements and hold bust movements (with moving hands) (see Figure 3). Furthermore, our preliminary results show that older signers produce long pauses within prosodic groups (see Figure 4). In addition, we took note of a break in the organization and fluency of the internal gestural flow of the prosodic groups. For our presentation at the Gespin2023 conference, we plan to propose a detailed typology of pauses (form and function) based on the two contrasting extremes of movement fluency alterity, thus accounting for the specificities observed for each of these two particular profiles.

Index Terms: French sign language (LSF), pause, hold, fluency, gestural prosody.

Figures 1 and 2: Illustrations of the inertial sensors motion capture device

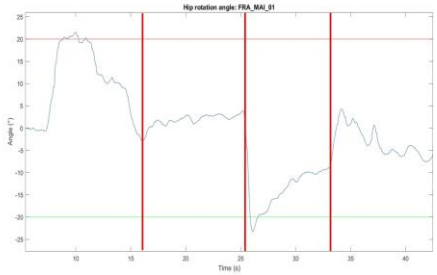

Figure 3: Curve representing the rotation of the bust of an extract of the poem "Une Maille à l'endroit" by François Brajou – in red: four positional holds.

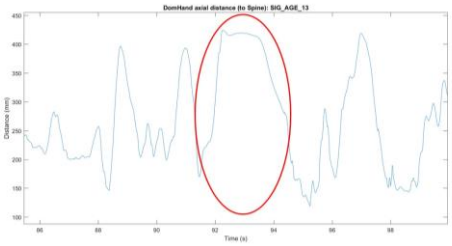

Figure 4: Curve representing the amplitude of manual movement of a deaf elderly person. In red: a positional holding interpreted as a pause positioned in a prosodic group.

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