Portuguese Sign Language M2 acquisition: kinematic analysis contribution in the identification of possible phonological errors in movement parameter

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Abstract

Portuguese Sign Language (LGP) is increasingly being used by adult hearing students who learn it as a Second Modality (M2), however, their proficiency levels hardly reach those of native deaf signers.

Since 1960, authors like Stokoe, Lidell e Klima & Bellugi began to study the internal organization of isolated signs and have identified five parameters that, in simultaneous, distinguish one sign from the other (Klima & Bellugi, 1979), being the Movement parameter considered the most difficult and complex to analyze. Tyrone (2001) observed that three- dimensional motion capture (3D) has been an analysis technique used by different researchers (Poizner et al., 1983; Wilcox, 1992; Mauk, 2003; Cheek et al., 2001; Cormier, 2002; Pettito, 2004).

Phonological errors in Movement parameter were reported in M2 adult learners, in particular, proximalization (Mirus et al., 2001; Rosen, 2004), and in children, more specifically proximalization/distalization, cyclicity and accuracy of joint usage (Meier et al., 2008; Conlin et al., 2000; Meier & Mauk, 2004).

The goal of this study were to identify differences in the Move-ment parameter of isolated

signs produced by hearing adult signers who belonged to groups with different levels of proficiency, comparing them to model proficient group of deaf LGP teachers, through the 3D kinematic analysis of the angular amplitude variable. Additionally, we aim to identify possible phonological errors in movement linked to the signers' level of proficiency, as well as the type of predominant movement in each joint. The sign productions of 23 signers with different levels of proficiency were collected: beginner (6), intermediate (6), advanced (6) and proficient (5), having been analyzed 6 signs. The kinematic data was collected through the Vicon's Mx Motion Capture System, with eight MX13 infrared cameras; 41 reflective markers were placed on the signers' body. The 3D reconstruction and its kinematic analysis were performed using Nexus/Vicon software, with image-capture speed of 125 frames per second.

Errors of Proximalization/Distalization of Movement were identi-fied, as well as variations like additions/subtractions in joint usage, these being characteristic of a specific level of proficiency. There were also identified three differences in the types of movement that were predominant in each joint: opposite, only produced by the proficient group and only produced by the other groups. The hypothesis of typical phonological articulation in a particular joint has been observed in some signs. We consider that kinematic analysis is a powerful means of detailed analysis and should continue being explored in LGP investigations.

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