Learning to be a sign language user: the influence of gestures and visual iconicity on the acquisition of British Sign Language phonology in hearing adults.

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INTRODUCTION

• Meaningless phonological units combine together to create meaningful signs: handshape, location, movement (Stokoe 1960) and orientation (Battison, 1978).

• ICONIC signs have forms visually related to characteristics of their referents. Depending on how evident they are to the naive observer, Klima and Bellugi (1979) classified them as transparent, translucent, opaque and obscure (see figure 1).



Figure 1. Signs in BSL with different degrees of iconicity. From left: CAMERA (transparent), HOLLAND (translucent), LIMP (opaque) and WHAT (obscure).

• Research in sign language L1 acquisition has established that handshape is the first parameter to be mastered followed by movement and then location (Petitto, 2000). This developmental pattern seems to be driven by maturing motor and perceptual systems.

• Newport and Meier (1985) reported that deaf children show no preference for learning iconic signs. This is consistent with observations that gesture comprehension develops at 24 months (Namy, 2008), much later than first signs.

• Evidence also suggests that hearing adult learners make some of the same errors found in L1 acquisition: displacements, deletions and substitutions (Rosen, 2004; Ortega and Morgan, in press) and proximalization (Mirus, Rathmann and Meier, 2001) despite fully developed motor and perceptual systems.

• The aim of the current study is to study in detail the errors of hearing adults acquiring sign language phonology.

RESEARCH QUESTIONS

- 1. Do hearing adult L2 learners of an SL make similar errors to those of child L1 learners?
- 2. What role does iconicity (gestural knowledge) play in L2 sign language acquisition?

METHODOLOGY

EXPERIMENT 1: PHONOLOGY

• Nine hearing adults (8 females; mean age=23.66 years, range=18-24, SD=1.98) took part in a sign repetition task (see figure 2).

• Stimuli were 96 BSL signs (Vinson et al, 2008).

• Participants were filmed in two separate sessions: 1) before they started a beginners BSL Level 1 course; 2) 11 weeks later after the end of the course (22 hours of total instruction). In both sessions participants repeated the same signs in different randomised order.

• Three independent coders rated the accuracy of articulation for each phonological parameter. Disagreements were discussed and resolved and in the end 100% agreement was achieved.



Figure 2. Sign repetition task for experiment 1. Participants had to imitate the target sign from memory as accurately as possible.

EXPERIMENT 2: ICONICITY

• A different group of fifteen hearing adults (8 females; mean age= 23.93, range=18-31, SD=4.96) took part in a sign repetition task (see figure 3). None of them reported having knowledge of any signed language.

• Stimuli were 96 BSL signs (48 iconic and 48 noniconic) in 6 different sign groups as categorised by Battison (1978) (see figure 6 in far right column).

• Participants' articulations were coded by three independent coders.



2 seconds 5 seconds 5 seconds Figure 3. Sign repetition task for experiment 2. This task was the same as in Experiment 1, but the target sign was preceded by its English translation, in order to activate gestural knowledge in the mental lexicon.

RESULTS EXPERIMENT 1: PHONOLOGY

• A 2 (session) x 4 (parameter) repeated measures ANOVA revealed main effects in session [F(1,8) =25.150, p=0.001] and parameter [F(3,24) =163.39, p=0.000] but no interaction [F(3,24) =1.030], p=0.397].

• Paired sample t-tests with Bonferroni corrections revealed significant improvement in all parameters except movement.



Figure 4. Graph showing improvement in articulation per phonological parameter after 11 weeks of instruction.

EXPERIMENT 2: ICONICITY

• A 2 (iconicity) x 6 (sign group) repeated measures ANOVA showed a main effect of iconicity [F(1,14) = 5.65, p=0.032] but no effect of sign group [F(5, 70)=2.26, p=0.064]. We found high significance between factors [F(5,70)=8.40, p<0.001] which suggests that iconicity influences accuracy in articulation (see figure 5 and 7).



Figure 5. Graph showing differences in accuracy between iconic and non-iconic signs.

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Figure 6. Battison's (1978) sign classification: 1) one handed signs in neutral space; 2) one handed signs with contact to the body; 3) two - handed signs in neutral space; 4) two-handed signs with contact with the body; 5) two-handed signs with the same handshapes and one acting upon the other; 6) two-handed signs with different handshapes and one and one acting upon the other.

A paired sample t-tests with Bonferroni corrections for each phonological parameter across iconic and non-iconic conditions revealed that signs in group 5 and 6 (see Figure 7) are more complex than the other

groups. Proportion of correct articulations



Figure 7. Graph showing differences in overall accuracy between groups. Iconic signs decrease in accuracy while non-iconic signs remain constant.

CONCLUSIONS

 Learners of a SL as L2 make some of the same mistakes reported in L1 acquisition despite having a fully mature motor and perceptual system.

 Iconic signs are less accurately produced than non-iconic probably because L2 learners have already existing gestural representations that resemble iconic signs but which in fact differ in some of its formational parameters. The iconic signs adults learn are overridden by these existing representations. Contact details: Gerardo Ortega g.ortega@ucl.ac.uk

