Effects of Learning American Sign Language on Co-speech Gesture

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Anecdotally, people report gesturing more after learning ASL

• If true, this would indicate an unusual effect of the non-dominant L2 language (ASL) on the dominant L1 language (English)
  – Gesture creation interacts on-line with speech production processes (e.g., McNeill, 2005)

• For spoken languages, cross-language interference rarely occurs from the L2 to the L1
Overview

• Study 1: Survey of signed vs. spoken language learners after one year of instruction

• Study 2: Longitudinal study of signed vs. spoken language learners before and after one year of instruction
Study 1: Survey

- Students surveyed after two semesters of a foreign language at San Diego State University:
  - ASL, N = 102
  - French, N = 72
  - Italian, N = 47
  - Spanish, N = 119 (total spoken learners = 238)
Survey Questions

1. After learning French/Italian/Spanish/ASL, do you think you gesture while talking (in English):
   less  more  the same

2. Do you feel that gestures you make while talking have changed since learning French/Italian/Spanish/ASL?
   yes  no

3. If yes, please explain how you think your gestures have changed.
Most ASL learners felt their gesture frequency increased after 1 year.
ASL learners, unlike spoken language learners, felt their gestures changed
Survey Results: How have your gestures changed?

Changes in **use** of gestures: (signed and spoken learners)
- more exaggerated/enthusiastic/intense/animated/larger
- more expressive/descriptive/meaningful
- to express emotion

Changes in **form** of gestures: (signed and spoken learners)
- different hand motions
- more defined/precise

Change in gesture **content**:
- insert ASL signs/more ASL-like (57% of ASL learners)
Survey Results Summary

• After one year:
  – ASL learners perceived an increase and a change in their co-speech gesture
  – Spoken language learners felt their gestures remained the same

• When changes in gestures were perceived:
  – Spoken and sign language learners reported some changes in use and form of gestures
  – ASL learners overwhelmingly felt a direct influence from ASL
Questions

• Does learning a manual language (ASL) actually increase gesture rate or change gesture form when speaking English?

• Or are ASL learners just perceiving a difference (that is not there) because they are paying more attention to their hands?
Study 2: Longitudinal Study

- 21 hearing native English speakers learning ASL
- 20 hearing native English speakers learning a Romance language (control group) (Italian = 9, French = 4, Spanish = 7)
- data collected before and after 1 academic year of exposure to the language
- watched *Canary Row* in 8 segments
- retold cartoon in English to a non-signer
- analyzed bowling ball scene and Tarzan scene
Predictions for gesture production in ASL learners

- Rate – may increase due to learning to use the hands for communicative purposes
- Content – influenced by ASL
  - use of ASL signs
Production of ASL signs when speaking to non-signers

• In the survey, ASL learners reported using ASL signs while speaking English

• Native ASL-English bilinguals produce code-blends when speaking with non-signers (Casey & Emmorey, 2009)
Predictions for Gesture Production in ASL Learners

• Rate – may increase due to learning to use the hands for communicative purposes

• Content – influenced by ASL
  – use of ASL signs
  – increase in iconic and deictic gestures
  – increase in gestures from the character’s point of view, mirroring role shift in ASL

• Form – influenced by ASL phonetic inventory: increase in handshape variety due to marked handshapes in ASL (e.g. E, K, Y)
Results: Increase in gesture rate for ASL learners only

![](image)
Results: Co-speech signs

• Five (out of 21) learners produced ASL signs when speaking English, but signs were relatively rare (mean = 2.6 signs; range = 1 - 5 signs)

• No spoken language learners produced non-English words
Results: Increase in iconics for ASL learners only

* $p = .05$
Results: Increase in character viewpoint for ASL learners only
Results: Increase in handshape types for ASL learners only

Handshape Types

<table>
<thead>
<tr>
<th>Handshape Types</th>
<th>ASL Learners</th>
<th>Spoken Learners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Post</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

* $p = .02$
Results: Increase in marked handshape types for ASL learners

Marked Handshape Types

* p = .002
Results: Language exposure difference after 1 year

Marked Handshape Types

* $p = .01$

Number of Types

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<td>*</td>
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Pre

Post

[Graph showing the comparison of marked handshape types between ASL learners and spoken learners before and after 1 year with a significant difference indicated at * $p = .01$.]
Summary: Study 2

Minimal exposure to ASL in adulthood appears to change co-speech gesture when speaking English:

– increase in gesture rate
– insertion of ASL signs
– increase in iconics
– increase in character viewpoint
– increase in variety of handshape types
Why?

• Sign language and co-speech gesture share a modality
  – Gesture creation can draw on knowledge of ASL

• Dual language activation -- even with minimal L2 knowledge
  – L2 (ASL) does not compete with L1 (English) for articulation, unlike a spoken L2
  – Failure to suppress ASL signs does not disrupt the spoken message, unlike a code-switch to another spoken language
Further Questions

• Do ASL effects on co-speech gesture in L1 increase with increased bilingualism?
  – New ASL learners did not differ significantly from non-signers on most measures
  – Proficient late English-ASL bilinguals produced more iconic and deictic gestures with more varied handshapes than non-signers (preliminary data)

• Do early and late English-ASL bilinguals differ in the effects of ASL on co-speech gesture?
  – Proficient late bilinguals produced more ASL signs in co-speech gesture than native bilinguals (preliminary)
Thank You!

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