Profile of a Family’s Bimodal Bilingual Development

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Background
The Family ASL project documents hearing parents’ development as L2 signers (the sign language is an L2) in a modality that differs from that of their previously acquired languages(s) and examines how these attempts affect their children’s development in sign and/or speech (Murrell et al., 2021). Here, we summarize one family’s journey over the course of their year-long participation in our longitudinal study.

Research Question
What is the effect of parental attempts at learning a sign language on their children’s linguistic development in sign and/or spoken language?

Methods
This parent and child dyad is the first of multiple families to complete our longitudinal study. Families met with a deaf ASL specialist on Zoom over 50 weeks, developing their ASL through lessons, discussions, reviews, etc. During this time, two types of data were collected (see supplemental handout for additional results and details):

Weekly 30-minute spontaneous language samples, analyzed for:
- Proportion of use of ASL vs. English (modality)
- Syntactic diversity of mother’s signing (ASLıpSyn)
- Syntactic diversity of child’s spoken English (EngıpSyn)
- Syntactic complexity of child’s spoken English (EngMLUn)

Periodic experimental tasks include:
- ASL: vocabulary knowledge (ASL, CDI)
- ASL: phonological accuracy at feature level (ASL PET) Child only
- English vocabulary knowledge (Eng CDI)
- General communicative skills (VOSL)

Results
Child: Language and cognitive development was similar to that of bimodal bilingual children with access to ASL, from birth (Gallaudet & Lillo-Martin 2008). Over the year, both ASL and English skills increased steadily. Modality was mostly speech only or bimodal.

Parent: High scores for vocabulary and phonology, with grammar scores increasing over time. Modality was mostly speech only or bimodal, but final sample was nearly all sign-only.

Discussion
The parent already had conversational proficiency upon entry to our study, so scores for vocabulary and sign form (phonology) began and remained near ceiling; ASL grammar scores increased over time. Child’s ASL and English scores suggest that home ASL input was sufficiently rich to support the child’s ASL development, which did not prevent English development (cf. Murrell et al., 2021). For both parent and child, utterances involving signing (sign-bimodal) consistently made up the majority of analyzed sessions, confirming previous reports that hearing parents committed to a bimodal bilingual approach can sustain a home environment conducive to their deaf child’s early ASL and English development, even as L2 signers (Lu et al. 2016, Caselli et al. 2021, Lieberman et al. 2022, Chen-Pichler 2021).

This case study strengthens existing arguments that early access to ASL for deaf children from hearing parents supports successful bimodal bilingual development.

Acknowledgements
Research reported in this publication was supported by the National Institute on Deafness and Other Communication Disorders of the National Institutes of Health under Award Number R01DC15991. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

We are very grateful to the participants in this study, who stuck with us over the course of a year and have generously shared their ASL learning journey with us. See handout for references cited and full list of results.
Table of Results

<table>
<thead>
<tr>
<th>TASK</th>
<th>Child's age</th>
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<tbody>
<tr>
<td></td>
<td>2:00</td>
</tr>
<tr>
<td>ASL IPSyn (146 max)</td>
<td>57</td>
</tr>
<tr>
<td>ASL PET</td>
<td>94%</td>
</tr>
<tr>
<td>ASL CDI (100)</td>
<td>94</td>
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<tr>
<td>ASLPI (0-5)</td>
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<tr>
<td>ASL-CT (30)</td>
<td>234/64</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Modality (proportion)</th>
<th>sign</th>
<th>speech</th>
<th>bimodal</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASL PET</td>
<td>69%</td>
<td></td>
<td>80%</td>
</tr>
<tr>
<td>ASL CDI (100)</td>
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<td></td>
<td>92</td>
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<tr>
<td>VCSL (scaled)</td>
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<td>65</td>
</tr>
<tr>
<td>Eng IPSyn (118 max)</td>
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<td>21</td>
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<tr>
<td>Eng MLUm</td>
<td>1.5</td>
<td>1.7</td>
<td>1.6</td>
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<tr>
<td>Eng VOCD (raw score)</td>
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<td>36.9</td>
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<tr>
<td>Eng CDI (100)</td>
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<td>86</td>
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<tr>
<td>Eng PPVT-5 (scaled)</td>
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<td>DAYC-2 Cog (scaled)</td>
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<td>DAYC-2 SE (scaled)</td>
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<td>Modality (proportion)</td>
<td>sign</td>
<td>speech</td>
<td>bimodal</td>
</tr>
<tr>
<td></td>
<td>250/48</td>
<td>18/16/56</td>
<td>10/26/82</td>
</tr>
</tbody>
</table>

Key to Assessments

**Parent / Child measures**

**ASL PET** ASL Phonological Elicitation Task - requires repetition of ASL signs and scored for phonological accuracy at feature level; overall percent accuracy reported

**ASL CDI** ASL Communicative Development Inventory (Caselli et al. 2020) - a measure of vocabulary knowledge ('understands and signs'). 100 sign version

**Modality** Proportion use of sign, speech, or bimodal utterances in a 15-minute language sample

**Parent measures**

**ASL IPSyn** ASL Index of Productive Syntax (Lillo-Martin et al. 2017) - a measure of syntactic diversity; maximum score 146

**ASL-CT** ASL Comprehension Test (Hauser et al. 2016) - multiple choice online comprehension test

**Child measures**

**VCSSL** Visual Communication and Sign Language checklist (Simms et al. 2013) - general communicative skills; results presented as scores scaled 0-100 (Allen & Morere 2022)

**Eng CDI** MacArthur-Bates Communicative Development Inventory - Short form (Fenson et al. 2000) - a measure of vocabulary knowledge

**Eng PPVT-5** Peabody Picture Vocabulary Test - 5 (Dunn 2019) - Vocabulary comprehension task

**The following 3 measures** are scored using KidEval (Ratner & MacWhinney 2016)

- **Eng IPSyn** Index of Productive Syntax (Scarborough 1990) - a measure of syntactic diversity; maximum score 118

- **Eng MLUm** Mean length of utterance in morphemes

- **Eng VOCD** A measure of vocabulary diversity (McCarthy & Jarvis 2007)

**DAYC-2** Developmental Assessment of Young Children - 2 (Voress et al. 2012) - Cognitive and Social/Emotional scales

References cited


Caselli et al. (2021). Deaf children of hearing parents have age-level vocabulary growth when exposed to American Sign Language by 6 months of age. [https://doi.org/10.1016/j.jpeds.2021.01.029](https://doi.org/10.1016/j.jpeds.2021.01.029)

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