Investigating Signed Language Disorders: Case Study Methods and Results

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Atypical spoken language acquisition

- Developmental language & communication disorders exist in a notable percentage of the population of children acquiring spoken language.
  - Specific Language Impairment (SLI)
    approximately 7% of hearing children who speak English (Leonard, 1998)
  - Phonological Difficulties
    Over 6%of otherwise normal children are referred to SLPs or therapy clinics (Broomfield & Dodd, 2001)
  - Stuttering [fluency disorder]
    2.5% of African American and European American ages 2-5 stutter (Proctor et al., 2008)

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Atypical *signed* language acquisition (ASA)?

- Few descriptions of Deaf children who exhibit so-called signed language disorders
  - Morgan (2005) & Marshall, Denmark, & Morgan (2006), Morgan et al., (2007) report on cases of potential Specific Language Impairment (SLI) in children acquiring British Sign Language (BSL)
  - anecdotal accounts of atypical acquisition in ASL, but no reports in the literature

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What may cause a "signed language disorder"?

Child-centered causes:

- Specific Language Impairment (SLI); only affects linguistic domain
- Spatial-cognitive deficit that affects linguistic functioning in sign
- Motor impairment or visual processing problem that interferes with sign language production or comprehension

Environmental causes:

- Delayed exposure to signed language (e.g., deaf children of hearing parents)
- Poor input models

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Environmental causes:

Our Strategy:
Focus only on deaf children who are raised in signing households and attend bilingual-bicultural residential schools for the Deaf (i.e., rich language environment)

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Plan for presentation:

I. Discussion of our **methodology** for investigating atypical signed language acquisition

II. Results from case study: "Alice"

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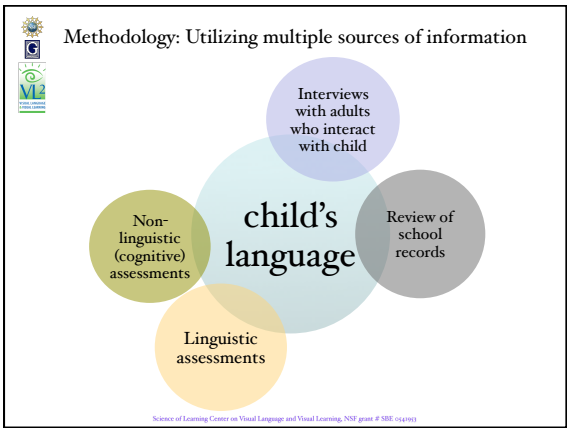

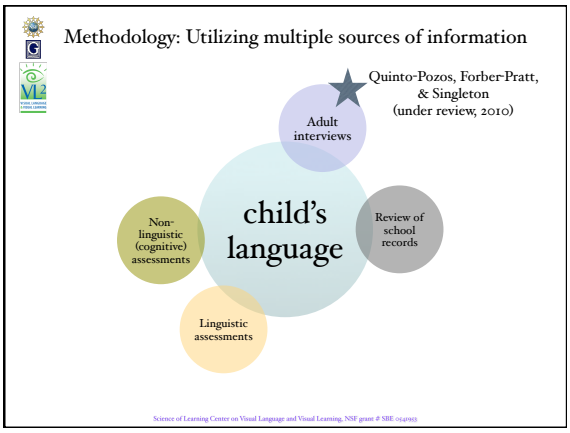

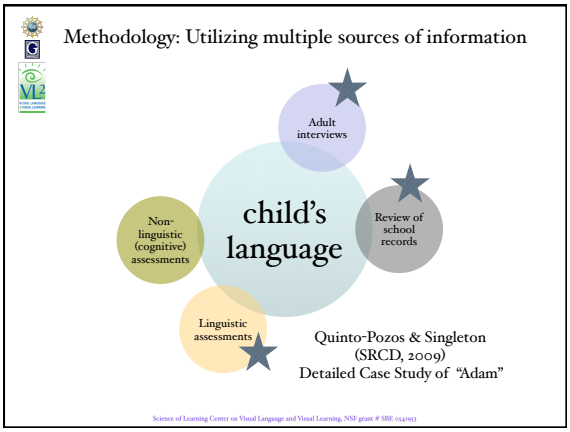

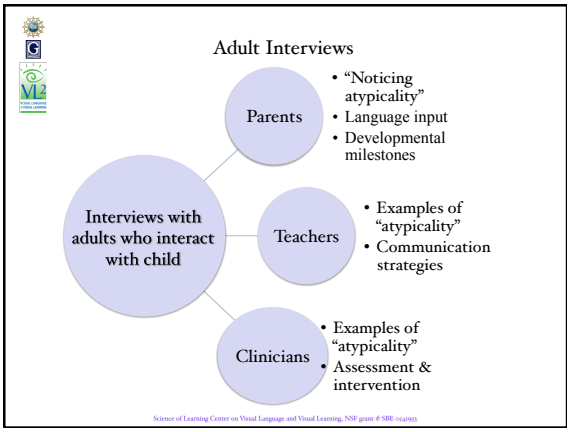

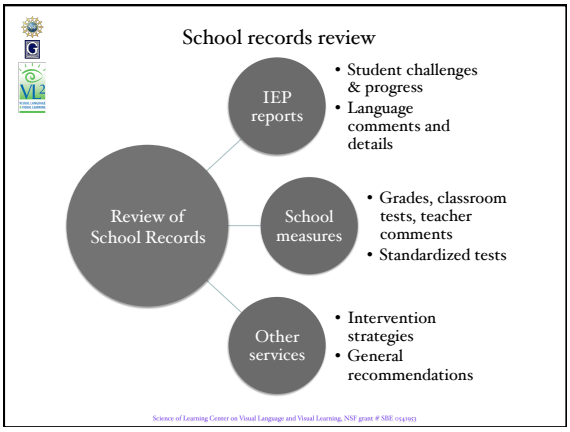

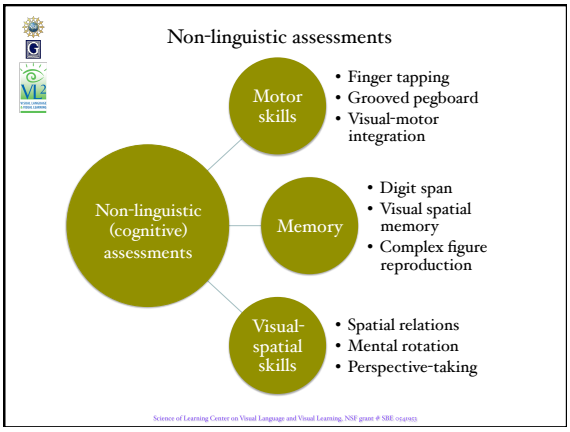

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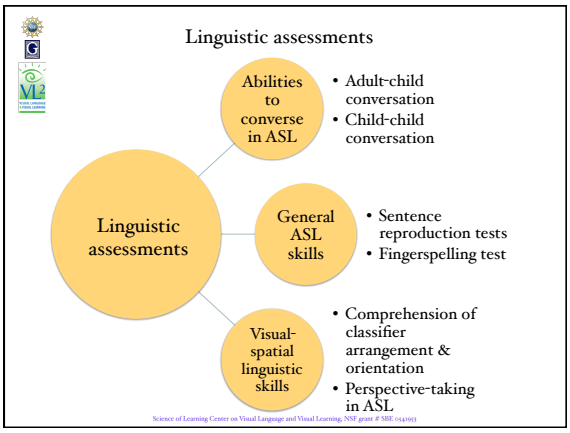

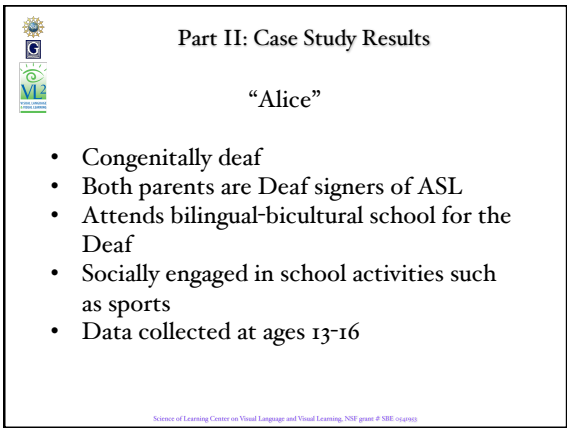

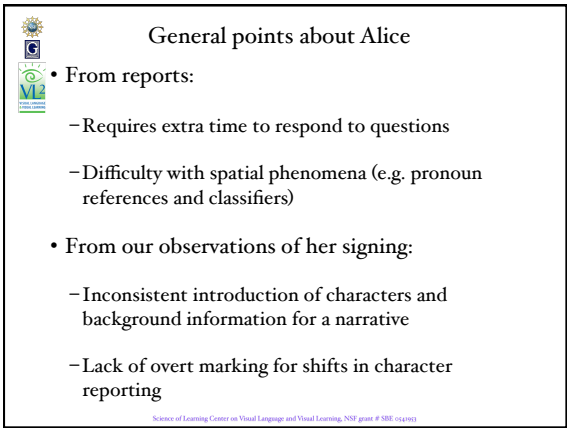

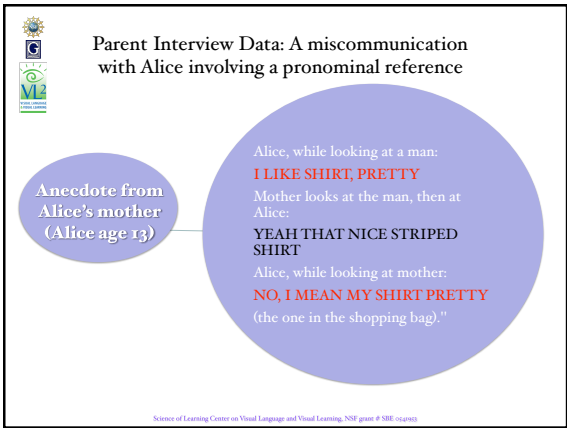

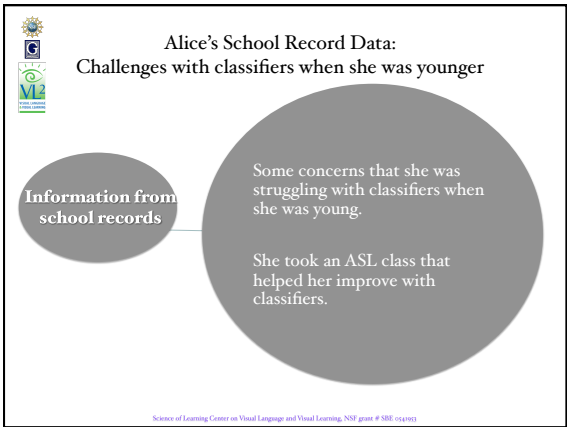

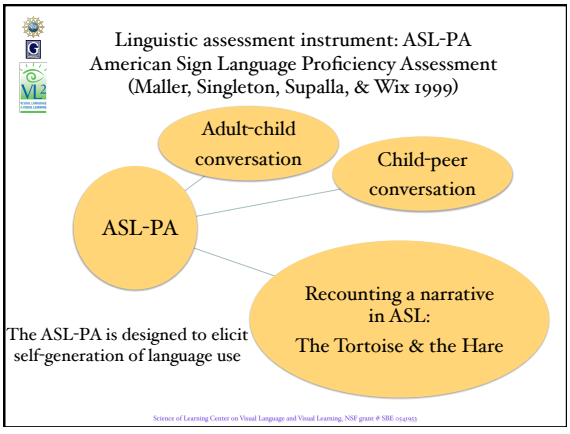

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Data from ASL-PA: Self production of ASL spatial devices often problematic

Qualitative analysis from native signing Deaf research assistant (Alice was age 13 at time of data collection):

- Tendency to use a small signing space
- Not particularly clear in her use of eyegaze and torso shifts to help differentiate characters and referents
- Signer reference frame seemed atypical

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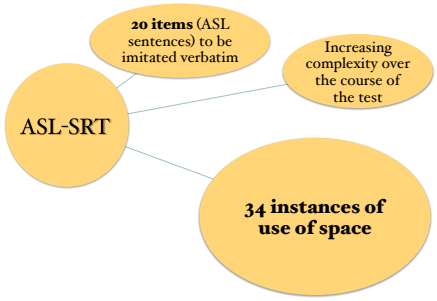
Linguistic assessment instrument: ASL-SRT American Sign Language-Sentence Reproduction Test (Paludneviciene et al., 2006)



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Analyses within our lab: ASL-SRT uses of space (not part of general scoring procedure for test)

ASL-SRT sentences contain various examples spatial devices:

1. **Pronominal references**: n=10
2. **Inflected or modified signs**: n=12
3. **Classifiers** (depicting verbs/signs): n=9
4. **Referential shift and constructed action**: n=3

We report on Alice's performance on categories 1 - 3

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Percentages of **correct responses** on imitation of ASL-SRT spatial devices

	Pronominal reference (n = 10)	Inflected & modified signs (n = 12)	Classifiers (n=9)
Alice 2009	**50%**	**83%**	**100%**
Alice 2010	**70%**	**75%**	**100%**

Comparison data from **5 age-matched peers**:

Mean	**56%**	**70%**	**80%**
SD	18%	13%	14%

General point: Alice **can** produce (i.e., imitate) spatial devices like her peers using this measure of performance

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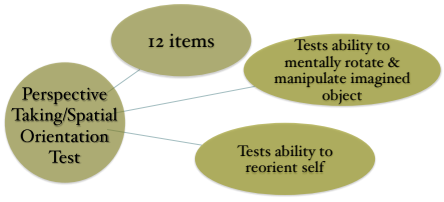
Non-Linguistic assessment instrument Perspective Taking/Spatial Orientation Test (Hegarty, Kozhevinkov & Waller 2008 version)



- Alice's performance:
  - **9 errors** suggesting an ego-centric, or body-centered, frame of reference (Alice: 2-3 *SD* below means for 18 year olds)
  - Left and right sides confused on those 9 errors
  - **One additional error** confused front and back

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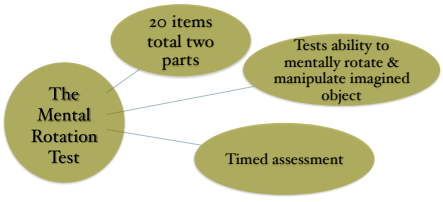
Non-Linguistic assessment instrument The Mental Rotation Test (Vandenberg & Kuse, 1978)



- Alice's performance:
  - **10 errors** on Part 1 (no correct responses)
  - **8 errors** on Part 2 (20% correct responses)

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Summary of Alice

- Atypical signing reported by parent and school records
- At age 13, self-generated examples of the use of space are often problematic
- Yet, the imitation of spatial phenomena within ASL sentences is in line with peer comparisons
- Poor performance on measures of non-linguistic visual spatial cognition (perspective-taking and mental rotation)

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What may be causing Alice's atypical performance on spatial phenomena?

- Possible deficits in non-linguistic spatial cognition (the processing and management of space)
- Such a deficit may be linked to one or more of the following:
  - Difficulty taking on a visual (physical) perspective that is not her own
  - Difficulty imagining a scene before using language to tell about the scene
  - Difficulty imagining how objects change appearance through movement
  - Spatial memory limitations

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Summary

Utilizing a multiple case study approach to investigating signed language disorders requires:

- Reports from adults who interact with the children
- Reports from the children's school records
- Collection & analysis of:
  - Linguistic data through formal assessments
  - Linguistic data from conversational settings
  - Non-linguistic data through formal assessments
- Comparison of atypically-developing children to their "typically-developing" peers

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