

# Disabled L2 learners not disadvantaged by phonological processing of signed language

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# Introduction

- ASL is a popular college language choice (Looney & Lusin, 2019; Welles, 2004)
- Growing number of students have language, learning, cognitive disabilities (Sanford, Newman, & Wagner et al., 2011)
  - #SayTheWord (Andrews, Forber-Pratt, & Mona et al., 2019)
- What is the experience of (hearing) disabled L2 sign language learners?

# L2 Learners and Disability

- Phonological deficits in disabilities such as dyslexia, ADHD/ADD, and Language Impairment (Abu-Rabia & Lenir, 2010; Schneider & Crombie, 2003; Bolden et al., 2012; Jackson et al., 2016)
  - May Impede L2 Learning (Schneider & Crombie, 2003)
  - Waivers vs. accommodation (Sparks, 2016)
- Does modality make a difference for L2 disabled learners?
  - Modality-specific or general deficits?

# M2L2 Learners

- M2L2 learners = learners of a *second language* in their *second modality* (Chen-Pichler & Koulidobrova, 2015)

## M1L2: English → French



## M2L2: English → ASL



# M2L2 Learners

- **Visual** phonology could pose a challenge to M2L2 sign learners (Chen-Pichler & Koulidobrova, 2015)
  - Manual sign phonological parameters include *handshape*, *place of articulation* (POA, location), *movement*, *orientation* (Fenlon, Cormier, & Brentari, 2018)
- Hearing non-signers may not treat certain parameters as categorical (Emmorey, McCullough, & Brentari, 2003)
- Hearing L2 signers demonstrate poor perception of movement **contrasts** (Bochner et al, 2011; Williams & Newman, 2016)

# M2L2 Learners and Disability

- Signed modality may provide benefits as well as disadvantages (Quinto-Pozos, 2014)
  - Larger articulators, slow signing speed
- Disabled high school students report (Singleton & Martinez, 2015):
  - Lower “difficulty” ratings of ASL compared to Spanish learners
    - IQ of participant may be a factor
  - Positive qualitative experiences with ASL in relation to disability:
    - “Built-in fidget” (ADHD)
    - “Helps me focus better” (Dyslexia + ADHD)

# Research Question

**Question:** Do L2 ASL college students with language, learning, cognitive disabilities perform differently than *no disability identified* (NDI) peers on a phonological discrimination task in ASL?

**Methods:** Biographical survey, ASL Phonological discrimination task (ASL-DT) (Bochner et al. 2016, 2011)

**Analysis:** 2x2 ANOVA (disability, course level)

# Participants

- 91 college level first semester (ASL I,  $n = 51$ ) and third semester (ASL III,  $n = 40$ ) students
- 70 female; 21 male
- 88 hearing; two Hard of Hearing; one CODA
- 25 indicated a learning, language, or cognitive disability
  - Self-reported diagnoses
  - “Learning disability” is an unclear term

**Table 1**
*Participants ( $n = 91$ ) by disability type*

ADD/ADHD	7
LEARNING DISABILITY	4
ADD & LEARNING DISABILITY*	3
DYSLEXIA	3
LANGUAGE IMPAIRMENT	2
APD	2
VISUAL	2
NARCOLEPSY	1
CONCUSSION/TBI	1
NO DISABILITY REPORTED	66

\*These individuals indicated both a learning disability and ADD/ADHD.

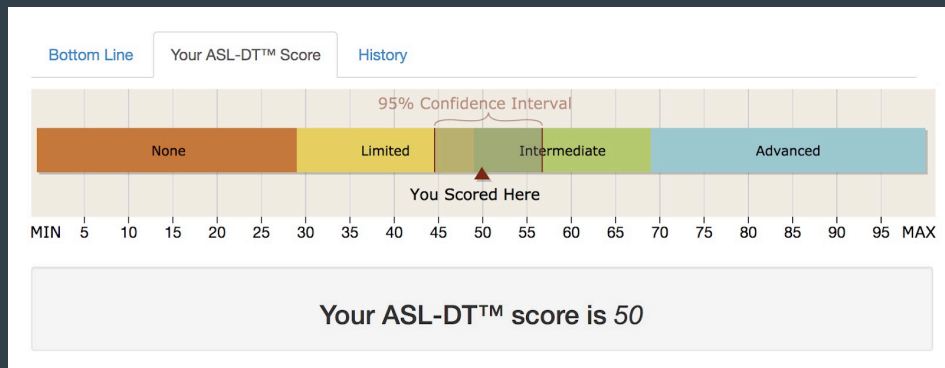


# ASL-Discrimination Task (Bochner et al., 2011, 2016)

- Paired phonological discrimination task:
  - Handshape
  - Movement
  - Location
  - Orientation
  - Complex morphology
- Participants view items and rapidly indicate “same” or “different”
- Native signers in clips
  - Non-contrastive variation

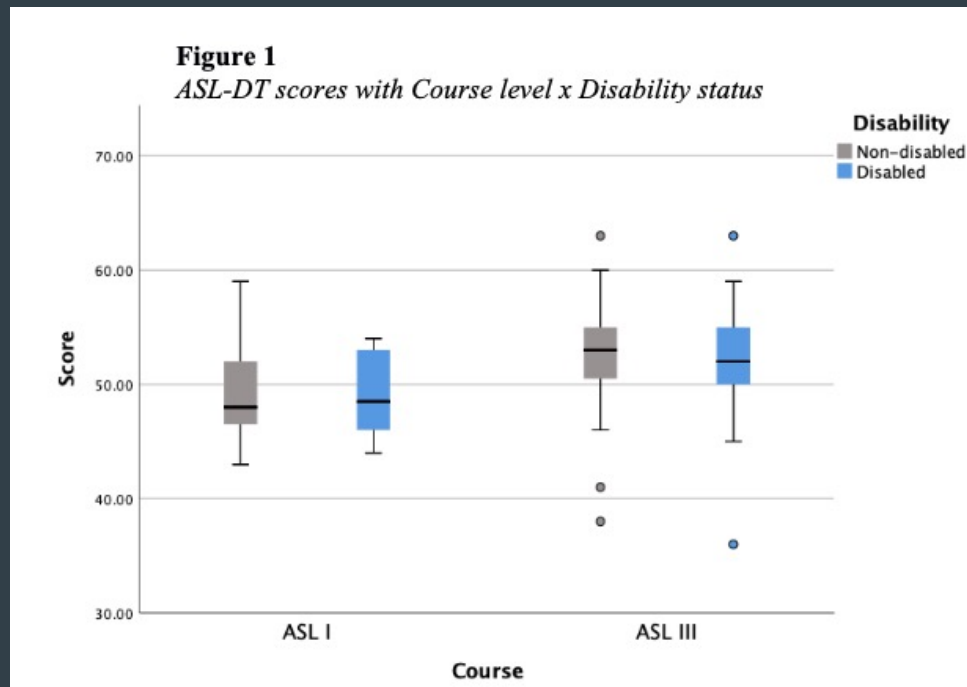
# ASL-DT (Bochner et al., 2011, 2016)

- 48 items consisting of two ASL sentence pairs
  - Possible answer for each item: same-same, same-different, different-different
- Scores reflect percent accuracy; credit only awarded for items in which participant responds correctly to *both* sentence pairs

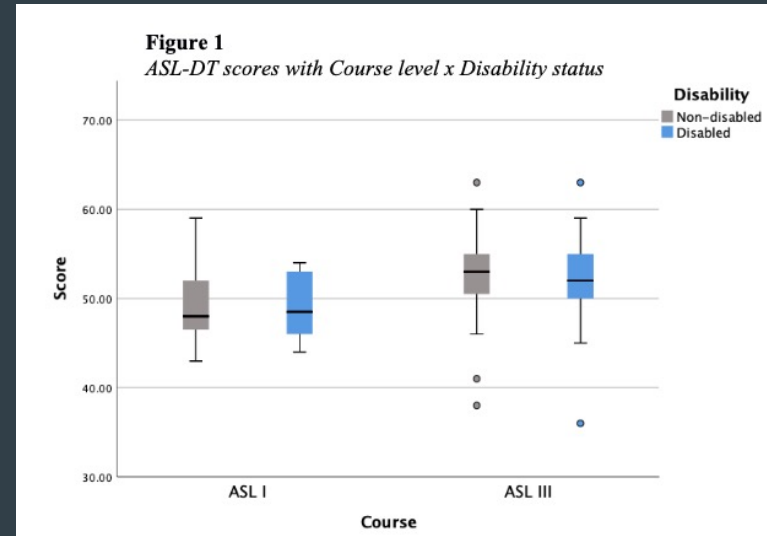


# Results

- Higher ASL III Scores
- More Variance in ASL I
- Outliers in ASL III
  - 3 no disability identified
  - High Score: Auditory Processing Disorder & Hard of Hearing
  - Low Score: Learning Disability



		Mean	SD	<i>n</i>
ASL I	NDI	<b>49.18</b>	4.364	28
	D	<b>48.80</b>	3.736	10
ASL III	NDI	<b>52.45</b>	4.551	40
	D	<b>51.62</b>	6.911	13



Bochner et al, 2011:

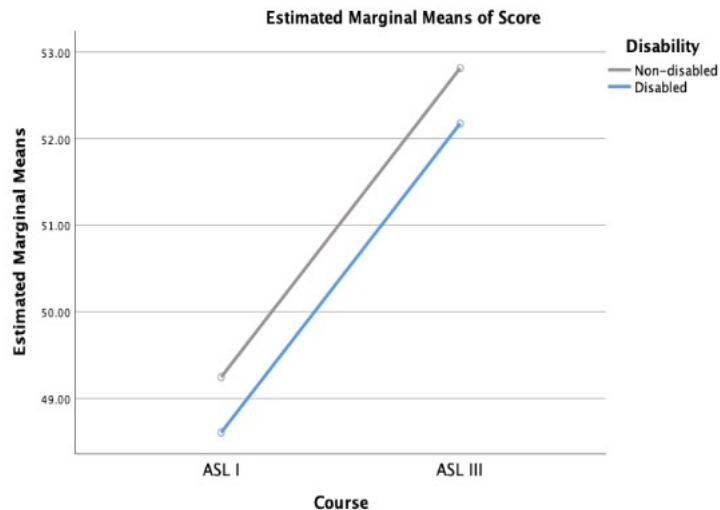
- Beginner (ASL I-III) ***M* = 61**
- Intermediate (ASL V) ***M* = 79**,
- Advanced (Deaf, native signers): ***M* = 86**

# Results

- 2x2 ANOVA (course level x disability status)
  - Significant effect for course level ( $F_{1,86} = 18.799$ ,  $p = .000$ , partial eta-squared = .185)
  - No significant effect for disability

**Figure 2**

*Estimated marginal means for ASL-DT scores with Course level x Disability status*

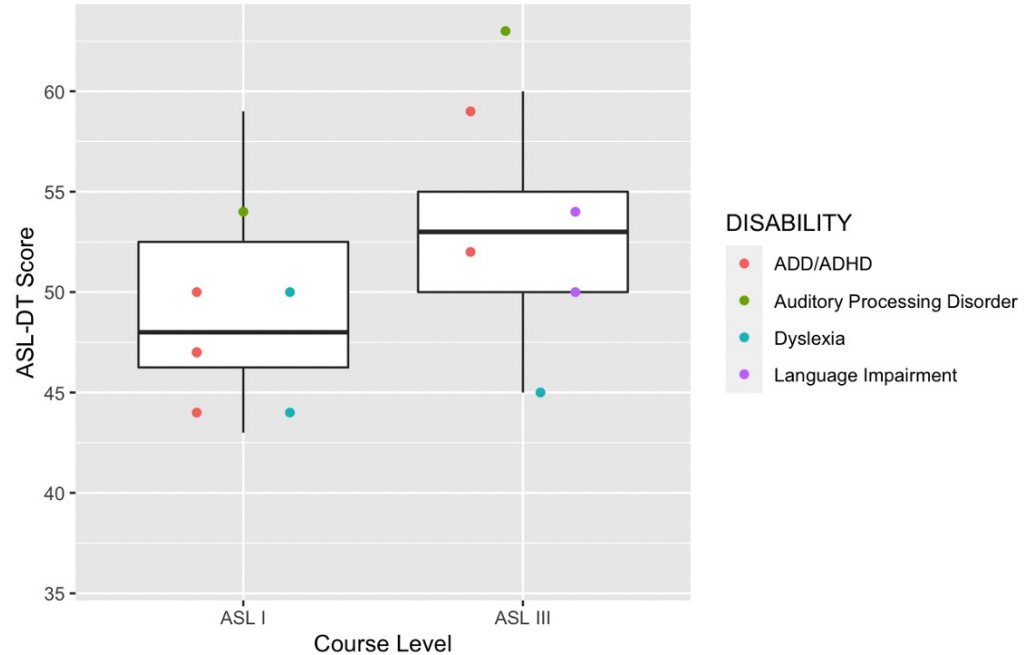


# Results

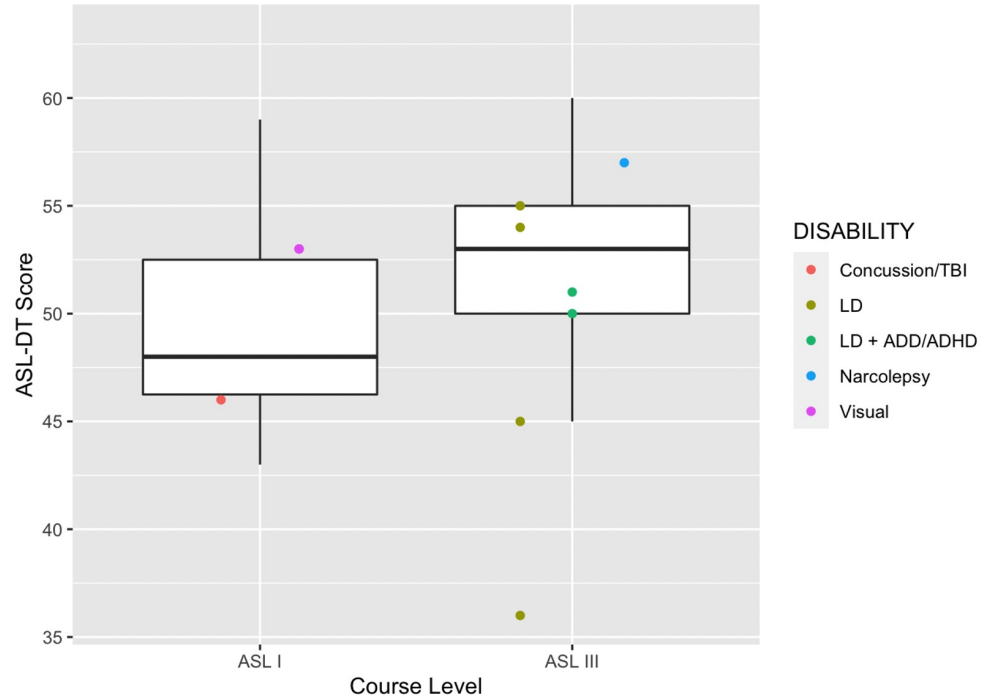
- Two students with Auditory Processing Disorder performed above average
  - One also identified as HoH
  - Poor spoken phonological skills
- Two low-performing dyslexic students

**Figure 3**

A. ASL-DT scores by course level, disability



**Figure 3**  
 B. ASL-DT scores by course level, disability, continued



# Discussion

- College level ASL students with self-reported language, learning, cognitive disabilities (n=25) performed like peers with no disability identified (n=66) on an ASL phonological discrimination task, suggesting that their spoken language impairments may not be correlated with visual phonological impairments.
- **PHONOLOGICAL PROCESSING ABILITY MAY BE MODALITY INFLUENCED**



Students' success on ASL phonological task may be accounted for by:

- **TASK DIFFICULTY:** Phonological discrimination tasks may not be as cognitively demanding as tasks that involve more STM/WM where underlying language deficits might become apparent
- **FLUID INTELLIGENCE:** Phonological discrimination ability may be more related to fluid intelligence. Note students attend highly selective university.

Students' success on ASL phonological task may be accounted for by:

- **LEARNED PROCESSING STRATEGIES** At ages of 18-22, students have many years of navigating education learning with their condition and may have developed effective compensatory strategies.

# Future Directions

- Follow up case studies with these ASL students with disabilities to consider global processing impairments (e.g., ADHD) vs. specific language disorders (e.g., APD) in more detail
- Interviews with ASL Instructors regarding their experiences working with such students (in progress)
- Interviews with ASL students with language/learning difficulties regarding their experiences learning ASL

# Future Directions

- Incorporate fluid intelligence (K-BIT) and perspective-taking skills into analysis
- Within-subjects design experiment comparing phonological processing in their native spoken language to L2: ASL processing

# Thank you!

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