

# Towards an OT account of handshape in ASL

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## Summary

{ADJ>>THUMB>>INDEX>>MIDDLE>>PINKY>>RING}

that accounts for opposed handshapes in Taiwan SL correctly predicts for larger ASL-LEX 2.0 dataset that selection of:

- the maximal number of fingers is most optimal/frequent
- fingers that are not physically next to each other is least optimal/frequent

## Terminology

- Selected fingers: those that are (i) moving OR (ii) not fully flexed or fully extended OR (iii) are fully extended. Does not include the thumb.
- Opposed handshape: selected fingers touch the thumb

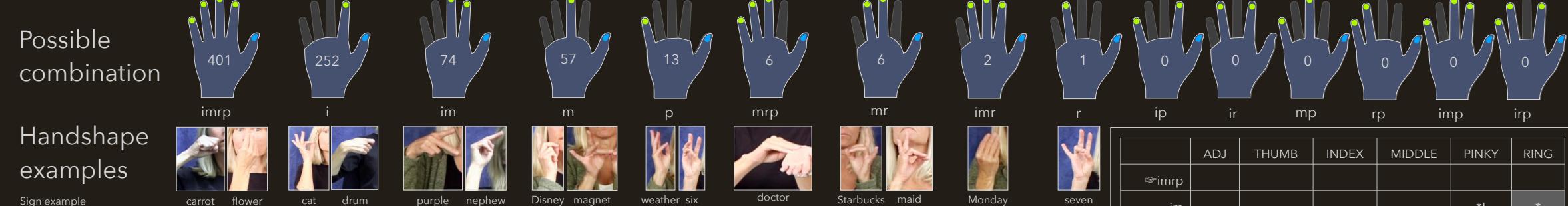
## 1. About this study

- Application of Ann & Peng (2000)'s (hereafter A&P) analysis of Taiwan SL to ASL. A&P:
- propose the following ranking (see 3 for constraints)  
 $\{\text{ADJ}>>\text{THUMB}>>\text{INDEX}>>\text{MIDDLE}>>\text{PINKY}>>\text{RING}\}, \text{EXT}^1\}$  based on relative frequencies of **196** signs with opposed handshapes
  - hypothesise that handshape frequencies follow from constraint ranking
- This paper analyses **812** signs with opposed handshapes from ASL-LEX 2.0 (Sehyr et al. 2021)

<sup>1</sup>EXTension excluded from this analysis

## 2. Frequencies of all logically-possible combinations of the fingers (Sehyr et al. 2021)

Find videos of signs by searching gloss on <https://asl-lex.org/visualization/>. i=index, m=middle finger, r=ring finger, p=pinky finger



## 3. Constraints

### FINGER SELECTION (SEL)

**THUMB**: parse the thumb (t)

**INDEX**: parse the index (i)

**MIDDLE**: parse the middle finger (m)

**RING**: parse the ring finger (r)

**PINKY**: parse the pinky finger (p)

**ADJACENCY (ADJ)**: all selected fingers must be adjacent

## 4. Analysis {ADJ>>THUMB>>INDEX>>MIDDLE>>PINKY>>RING}

- The ranking favours handshapes that select fingers:
  - closer to the thumb
  - next to each other
- Correct predictions
  - ip, ir, mp, rp, imp and irp least favoured – all are unattested
  - imrp most favoured – accounts for ~50% of the data
- Incorrect predictions
  - im>i. Actual = i>im
- Constraints do not account for seeming preference to select the maximal and minimal number of fingers (closest to the thumb)

	ADJ	THUMB	INDEX	MIDDLE	PINKY	RING
imrp						
im					*	*
i					*	*
mrp				*		
mr				*		
m			*		*	*
rp			*		*	
p			*		*	*
r			*		*	*
imp	*					
irp	*					
ip	*					
ir	*					
mp	*			*		
imr	*		*	*	*	*