

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

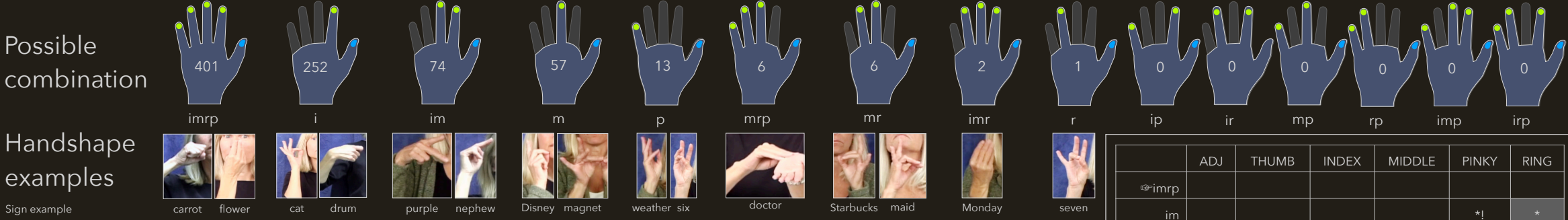
1. About this study

- 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) {{ADJ>>THUMB>>INDEX>>MIDDLE>>PINKY>>RING}, EXT¹} 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)

¹EXTension 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	*!		*	*		*

References: ■ Ann, J., & Peng, L. (2000). Optimality and opposed handshapes in Taiwan Sign Language. *University of Rochester Working Papers in the Language Sciences*, 1(2), pp. 173-194. ■ Sehyr, Z. S., Caselli, N., Cohen-Goldberg, A. M., & Emmorey, K. (2021). The ASL-LEX 2.0 Project: A Database of Lexical and Phonological Properties for 2,723 Signs in American Sign Language. *The Journal of Deaf Studies and Deaf Education*, 26(2), pp. 263-277.