Cognitive and linguistic control in verbs of motion and location: Acquiring plurals & arrangements

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Introduction

There is a great deal of research on ASL classifiers and verbs of motion (VoM) but very little work done on verbs of location (VoL). Arrangement in space and the accompanying motion to depict a VoL involves constructions that delineate movement of the verb as opposed to presenting a number of objects (plurality) in a locative frame. There is little work on what Deaf children know about making metalinguistic choices on how to establish classifiers within different arrangements in space to convey either a VoM or a VoL.

Depicting more than one object in phrases and sentences involves using plural forms in ASL. Plural forms tend to be nested inside classifier frames and predicates, especially VoL (Brendel, Hoffmeister, & Fish, 2005). Since ASL uses both hands to depict objects, the use of both hands may also indicate plural notions. The concept of two cars which are located in a specific arrangement in space requires an ASL form that uses both hands simultaneously placed in different locations. Figure 1 illustrates the concept of TWO-CARS IN-STAGGERD-4 PLACE-ARRANGEMENT.

In figure 2, the frame presents multiple cans with 3 upright cans and 1 on its side. There is no movement depicted. To represent multiple cans the secondary hand must be held in place while the primary hand in a CCL handshape stamps out two locations to the right of the held hand and turns the moving hand from its palm facing left to palm facing down. This depicts a VoL. Should the primary hand turn the moving hand from palm facing left to palm facing up, this would indicate a VoM. Talmy refers to these as verb derived nominals (Talmy, 1985, p. 84; 2003).

Figure 1: Example of Verb of Location (VoL) stimuli: 3CL + arrangement

Figure 2: Example of VoL stimuli

Purpose

Complex ASL plural processes are of interest to understand how Deaf children acquire or obtain control over the interaction of handshape, movement, the arrangement of elements, and verb-types in the acquisition process. We will present information on the developmental pattern in the type of verb, spatial arrangement and the classifier that appear in our data.

Subjects

Table 1: Subjects

|	Deaf Children Deaf Parents*	Deaf Children Hearing Parents*
Number of participants	132	468
AVG Hearing Loss	99.4	99

*No significant difference in age or hearing loss

- 600 Deaf children of deaf parents between 4 and 18 years of age: 132 DCDP (22%) , 468 DCHP (78%)
- The median chronological age (CA) was 12.0.

Procedures for Receptive Task

We administered the ASL plurals receptive task which is part of the American Sign Language Assessment Instrument (ASLAI), (Hoffmeister, Greenwald, Bahan, & Cole, 1989)

- Receptive metalinguistic judgment task for ASL vocabulary
- 21 multiple-choice questions (4 items)
- For each question, students saw the stimulus item on video, then a fade, followed by a sequence of four response choices.
- Subjects must choose the item that best reflects the best response to the stimulus.
- An example of a question from the response booklet (used by subjects 4 to 19 years old) is below:
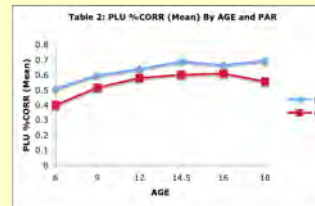
Figure 3: Item 19: TWO-STACKS-of-TOWELS

Q 19

A

B

C

D

Results

Table 2: PLU %CORR (Mean) By AGE and PAR
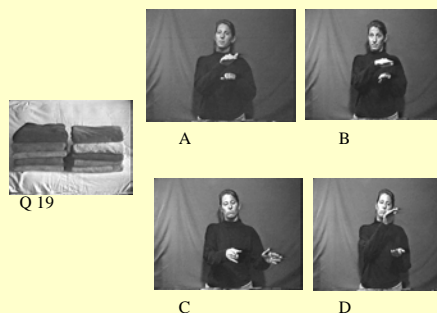
Table 2 shows the average score of DCDP & DCHP by age
- Children of deaf parents had better performance, X=.63 DP, X=.55 HP, p ≤ .00
- Pattern of acquisition between DCDP & DCHP was correlated
- Same items are experienced as difficult by both DCDP and DCHP
- Neither group reached ceiling in any item.

Table 3: Rank Order Item difficulty: 1=easy, 21=hard

Rank Order	Q Description	Q#	DCDPC	Q#	DCHPC	Q Description
1	BOOKS ON SHELF	2	0.91	2	0.87	BOOKS ON SHELF
2	PAPER-STACK	4	0.89	4	0.86	PAPER-STACK
3	CARS-Paired alternately	7	0.86	7	0.85	CARS-Paired alternately
4	PHONE BOOK	10	0.81	5	0.78	PENCIL-SCATTERED PHONE
5	FISH SWIM RANDOM	14	0.79	10	0.75	BOOK FISH SWIM
6	PENCIL-SCATTERED	5	0.77	14	0.74	RANDOM PILE OF
7	PILE OF CLOTHES	11	0.73	11	0.70	CLOTHES
8	CARS (IN A ROW	1	0.69	1	0.70	CARS (IN A ROW
9	BANANAS ON PLATTER	19	0.63	19	0.63	BANANAS ON PLATTER
10	HANGERS ON ROD	12	0.62	3	0.58	KEYS ON RING
11	KEYS ON RING	3	0.62	21	0.56	PICTURES ON WALL
12	PICTURES ON WALL	21	0.55	12	0.56	HANGERS ON ROD
13	COINS IN ROW	8	0.52	9	0.50	CANS STACKED
14	CANS STACKED	9	0.50	8	0.49	COINS IN ROW
15	BIRDS ON WIRE	16	0.50	13	0.49	BOTTLES-in-row
16	BOTTLES-in-row	13	0.46	16	0.49	BIRDS ON WIRE
17	TOWELS - 2 stacks	20	0.45	20	0.48	TOWELS - 2 stacks
18	SHOES IN ROW	18	0.24	18	0.20	SHOES IN ROW
19	CHAIRS IN ROW	6	0.23	15	0.20	MICE IN GROUP
20	MICE IN GROUP	15	0.22	6	0.17	CHAIRS IN ROW
21	FOOD IN REF	17	0.12	17	0.14	FOOD IN REF

Table 3 item difficulty shows:
- Similarity of item difficulty across DCDP and DCHP groups
- Handshape complexity is not the governing factor
- Movement appears to be the most difficult to control when both hands are independent and consist of simple classifier handshapes (CCL, VCL, 1CL), ROW/PILE/ANIMAL-IN-ROW.
- Movement plus doubling up in location is more difficult than when movement is on a single plane or in a single location, as in TWO-STACKS-of-TOWELS, TWO-ROWS-of-X.

Conclusions

Complex ASL plural items (verb derived nominals) tend to be formed in complex predicates (Verbs of Location) that require:
1. an interaction of a classifier handshapes (both hands representing an object), and
2. A dual locative frame for independent hands, and
3. Movement nested within one of the hands, or
  3a. in the case of two locations, movement is added to the whole plural frame (repeated), nesting a plural within a plural.

Nesting of handshape and complex movement appear to be the most difficult. These examples are equivalent to Talmy's (1985) verb derived nominals. This nesting process in ASL also presents younger subjects with the possibility of imposing a VoM where a VoL is required, which was a common error for the younger ASL learners. This suggests that movement is more difficult to acquire and obtain control over than handshape, even when the handshape refers to a group of objects (classifiers), and location.

Literature cited

Brendel, S., Hoffmeister, R., and Fish, S., (2005) Deaf children acquiring ASL classifiers: Errors and Pattern of Development in a Signed Language. Xth International Congress For the Study of Child Language, Berlin, Germany, July 28,

Talmy, L., (1985.) Lexicalization patterns: semantic structure in lexical form. In Schopen, T. et. al. (eds) Language Typology and Syntactic Description, vol 3, Cambridge University Press, New York.

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Acknowledgments

For further information

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