Patterns of Variation in ASL Semantic Classifiers: Native and nonnative VEHICLE handshapes

Marie A. Nadolske[i]

The specific structure under primary investigation in this study is the American Sign Language Semantic "Classifier" (CL) *VEHICLE*. This type of sign is typically used in the expression of the motion and/or location of an entity. The 3-handshape involved in VEHICLE has been said to represent a class of entities in its use. Aronoff et al. (2003) describe this categorical property of the sign and its applicability to an abstract category: "The ASL VEHICLE classifier can be used for cars, trucks, bicycles, trains, boats, submarines, and sometimes motorized wheelchairs (p. 67)."

Previous treatments of the VEHICLE CL have either not acknowledged possible variation in handshape, or they describe the 3-handshape selection with only a footnote mentioning that sometimes Deaf ASL signers select the B-handshape (Supalla 1990). The results reported here come from an investigation conducted in order to determine potential factors that may motivate the selection of one of the handshapes over other potential choices, and to determine what aspects of variation are systematic in three different populations of signers.

Elicited narrative data collected from three populations of adult ASL signers (Deaf native, hearing native, and hearing nonnative) were analyzed to assess if;

(1) Individual and group patterns for VEHICLE handshape use confirmed expectations of the 3-handshape selection.
(2) Levels of allowable variation were consistent across several types of vehicles indicating membership in a single category.
(3) Patterns or motivations for any alternate handshape selection could be identified.
(4) Nonnative or incomplete acquisition of these structures account for most of the observed variation.

A total of 15 signers were recruited from the greater Indianapolis region to control for the influence of regional variation. The first group (*DOD*)[ii] consisted of five Deaf native ASL signers who were raised by Deaf parents, had additional Deaf family members, used ASL as the language of the home, and attended residential schools for the Deaf. The next group (*CODA*) was comprised of five hearing native ASL signers who were also raised by Deaf parents and used ASL as the language of the home while growing up. The final group (*L2*) consisted of five hearing nonnative advanced ASL signers who were raised by hearing parents and American English was the language of the home while growing up. All L2 signers were first exposed to ASL after age 5 and began to seriously learn ASL post-puberty. To control for the influence of possible different levels ASL skill and to make the groups more comparable, all hearing signers in this study were ASL-English interpreters who held a minimum of state certification for interpretation. These signers were recommended for participation by a member of the Indianapolis Deaf community who was familiar with the local population of interpreters and aware of the need for participants to be highly skilled ASL signers. Table 1 below details relevant characteristics of signers in each of the three groups.

Table 1: Signer group characteristics

	DOD	CODA	L2
n =	5	5	5
Female - Male	4 - 1	3 - 2	4 - 1
Mean Age	27 yrs.	47 yrs*	30 yrs.
ASL Status	L1	L1	L2
ASL Skill	Native	Native	Advanced/ Native-like
Hearing Status	Deaf	Hearing	Deaf
Parents	Deaf	Deaf	Hearing
Interpreter	No	Yes	Yes

* Age of the CODA group was statistically significantly different than each of the other two groups. DOD & L2 groups were found to not be statistically significantly different from each other.

Each signer was individually asked to watch a series of short cartoon clips and then describe what he or she saw after each clip to the researcher, who was seated across from the signer and could not view the videos being played on a laptop. Signers were told that the researcher did not know the content of the videos to prompt more complete responses. The signers could view each clip as many times as they wanted, and their responses were video recorded for further analysis.

The target stimulus clip for this study was presented second in the series of clips, was 31 seconds in duration, and was presented without sound. This clip came from the television series "The Simpsons" the episode "Homer the Heretic" (Reardon 1992), and depicted several interactions between two cars, a train, and a boat.

Expectations from previous research would predict that all three groups would almost exclusively use the 3-handshape to depict the motions and locations of the three vehicle types in the signed narratives. Any use of the B-handshape should be minimal if it occurred at all.

DOD signers produced more variation than expected based on previous reports while the L2 signers produced the most variation of the three groups. The 3-handshape was found to be used to represent several types of vehicles, as was the B-handshape by all three groups. To summarize the group handshape selection results, Deaf signers produced the 3-, B-, and 1-handshapes; CODA signers used the 3-, B-, U-, and C-handshapes; and L2 signers produced the 3-, B-, 1- and C-handshapes.

When orientation was considered in combination with handshape, these group differences become clearer. DOD signers were most constrained in their selection of handshape and in the selection of handshape+orientation in that they used only one orientation for the 3-handshape (ulnar-side down), two orientations for the B-handshape (palm upwards and ulnar-side down), and one orientation for the 1-handshape (palm downward). CODA signers used the orientation for the 3-handshape described above; the two orientations Deaf signers used for the B-handshape

with the additional orientation of palm upward, one orientation for the C-handshape (ulnar-side down), and one orientation for the U-handshape (palm downward). The L2 signers produced the orientation for the 3-handshape described for both groups above plus the additional orientation of palm upwards, the three orientations described for CODA signers plus an upright orientation for the B-handshape, the same orientation as DOD signers for the 1-handshape plus an upright orientation, and the same orientation as the hearing native signers for the C-handshape plus an upright orientation.

These results indicate that the Deaf native signers have the most constrained use of handshape+orientation in VEHICLE CLs with only the B-handshape produced with two orientations. The hearing native signers allowed for an additional orientation to B-handshape and two additional alternate handshapes, with one orientation each, when compared to the Deaf signers. L2 signers produced one more orientation than the CODA signers for each of the 3-, B-, and C-handshapes. L2 signers also produced one additional orientation of the 1-handshape in comparison with the DOD signers.

The influence of different factors in the selection of handshape also varied by group. Vehicle type influenced Deaf signers in that references to the cars contained the most variety of handshapes in comparison to the fewer variants than those for the boat or train. Type of vehicle only exerted a moderate influence on the CODA group and had no observable impact for the L2 group. Pressures for articulation (e.g. fitting one handshape inside the opening created in another handshape) influenced the DOD and CODA signers, with only a low-level of influence on the L2 signers' selection of handshape. All three groups used handshape to emphasize certain surfaces of a referent, particularly with respect to the flat deck of the boat, which was represented with the B-handshape instead of the 3-handshape, which does not have a flat top surface. The use of the locative BE-AT in combination with a VEHICLE handshape consistently prompted the 3-handshape for both the DOD and CODA signers, however the selection of handshape in the BE-AT construction was inconsistent for the L2 signers. Finally, the systematicity within each individual signer was found to be high for the DOD group, high to moderate in the CODA group, and low for the L2 signers.

To summarize the findings of this study, the 3-handshape was used to represent vehicles, however the B-handshape was also commonly used in non-serial verb constructions. The DOD and CODA groups showed evidence that the type of vehicle was important for handshape selection. Handshape selection patterns and motivations identifiable in these data included: vehicle type, articulation pressures, surface emphasis, and the linguistic specificity of BE-AT. Finally nonnative or incomplete acquisition of VEHICLE did not account for most of the observed variation.

The results of this study show that the selection of handshape in ASL CLs is more complex than previous research would indicate. Most previous discussions of CLs have taken it that the 3-handshape is synonymous with all instances of membership in the category 'vehicle'. These data, however, exhibit far more variation and the patterns that emerge hint at the complexities that underlie the selection and use of various handshapes in CLs referring to vehicles in ASL. These findings expand our understanding of the systematicity in variation in ASL in a portion of the lexicon that was previously thought to contain little or no possible variation. Several linguistic motivations/explanations were also explored for their roles in influence on different language populations.

References:

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