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Gesture and ASL L2 Acquisition [1]

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0. Introduction

The recognition of ASL as a fully grammatical language--due in great part to Stokoe, Casterline, and Cronebeg's (1965) seminal work on the structure of ASL and subsequent studies (e.g., Stokoe, 1978; Klima & Bellugi, 1979; Liddell, 1980, 2000; Emmorey & Lane 2000)—has had as a consequence a growing interest in ASL and Deaf culture and a proliferation of ASL teaching programs all over the United States and Canada. In fact, ASL has become one of the most commonly taught languages in North America and is now accepted in many universities to satisfy the foreign/second language requirement for graduation. Yet, in spite of the large number of individuals (both hearing and deaf) who are now learning ASL as a second language (L2), studies on ASL acquisition as an L2 are rather scarce. While research on the L2 acquisition of spoken languages has attracted significant attention, sign language L2 acquisition remains largely an unexplored field. One might expect that sign language L2 learners face many of the same challenges as any other L2 learners and that past research on the L2 acquisition of spoken languages should be able to inform new studies on sign language L2 acquisition. However, due to the modality differences between spoken and sign languages, there are aspects of sign language learning—specifically those that relate to sign language spatial-visual grammar—that deserve special attention. With the purpose of helping to address this research gap, we conducted a longitudinal study focusing on the L2 acquisition of three components of ASL, namely, classifier structures (which we will refer to as third person discourse structures), role-shift or constructed action structures (which we will refer to as first person discourse structures), and the use of location in the signing space. Particularly, we tracked the early development of certain spatial skills that are

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central in the production of the above-mentioned components and addressed the following questions:

1) Do any preexisting spatio-visual skills transfer into the acquisition of the spatial aspects of ASL?
2) How do spatial skills develop in relationship to one another? That is, is there an ordering relationship for ASL skill development? Do some skills group together?

1. Rationale for our study

Linguistic transfer is an important topic in the study of L2 acquisition (See Gass 1996 for a review.) Transfer refers to the role that previous linguistic knowledge plays in the acquisition of an L2. Recent studies on the gestures produced by speakers have found that while gesture might not have a grammatical function, it is an important part of language and interacts with the grammatical elements of spoken languages in ways that are more systematic than previously thought (Kendon, 1986; McNeill, 1992). Since gesture makes use of the spatio-visual domain, it is possible that previous gestural abilities might transfer into the L2 acquisition of the spatial features of sign languages.

Many similarities have been noted between certain aspects of sign languages and the gestures produced by speakers. Liddell (2000) has created a precise explanation for this phenomenon based on conceptual blending. According to Liddell, both signers and speaking gesturers create a blend (Fauconnier & Turner, 1996) between an imagined mental space and real space (i.e., the conceptual model of the space in which they stand). In the blend, imagined entities are conceived of as located in the space around the person. Iconic and deictic gestures may be aimed toward those entities, or may track their progress through space. For sign languages, these gestures are tightly constrained to unify with lexical and grammatical elements, and they are consistently used and understood by the signing community. For spoken languages, gestures are loosely integrated with the speech signal and they may or may not communicate information to the listener. Additionally, in contrast to the consistency found across signers regarding the shape and usage of spatially-mapped information, the gestures of speakers show considerable variation as to their shape, size, and clarity and as to how much information they convey.

With the goal of quantifying the linguistic contribution of gesture in spoken language narratives, Taub, Piñar, and Galvan (2001) conducted a study in which native users of ASL, Spanish, and English were asked to retell cartoon episodes in their respective languages. Interestingly, subjects showed remarkable consistency within each language regarding what type of

conceptual information (i.e. path, manner, etc.) is likely to be expressed spatially (with or without accompanying lexical elements). However, a great deal of variation was also observed from subject to subject among English and Spanish-speaking subjects regarding the expressive quality of their gestures and the extent to which the whole body as well as facial expression was involved. Thus, while all hearing subjects expressed some conceptual information through iconic and deictic gesture, some subjects made better use of the space in front of them than others, making their iconic gestures more easily identifiable and establishing clearer connections between gestural elements. Additionally, only some subjects made use of their whole body or of specific hand shapes to create blends that were very similar in nature to the use of role-shift and classifiers in sign languages.

One of our questions, then, is whether the presence of sign language-like gestural elements in naive hearing subjects will transfer to the linguistically meaningful use of spatially mapped information when they learn ASL. That is, can the way in which speakers gesture predict their ability to acquire some of the linguistic spatial aspects of ASL that are typically considered key for acquiring adequate levels of signing skills?

2. Some previous studies in ASL L2 acquisition

Although there are no clear guidelines as to which aspects of ASL are harder to learn, a descriptive study by Locker, McKee & McKee (1992) reports both student and teacher intuitions regarding the degree of learning difficulty of several features of ASL. While the teachers' perception in general was that the students had more difficulty in most areas than the students themselves thought, teachers and students agreed in identifying what the more difficult learning tasks were. One such task was adapting to the visual-gestural modality, that is, becoming comfortable with using the body. Both students and teachers also mentioned dexterity and coordination in producing and connecting signs, facial expression and other non-manual signals, spatial indexing through deixis, eye-gaze, and body-shift and classifiers. Fingerspelling was also rated as highly problematic.

Wilcox &Wilcox (1991) also address the issue of identifying difficult aspects of ASL. In their view, linguistic features aside, the most obvious difference between English and ASL is modality, which creates both production and reception difficulties for the adult hearing learner. Additionally, some of the characteristics that they identify as hard to learn are non-manual grammar features, the fact that ASL is a polysynthetic language that depends heavily on morphological inflection, and the use of classifiers. Thus, some of the features that have been identified in the literature as posing learning difficulties are part of the spatially-mapped component of ASL and may be found in a non-grammaticalized way in the co-speech gestures of hearing learners. If so, it

might be possible to devise strategies to tap into this pre-existing visual-spatial knowledge in order to facilitate the acquisition of the use of space in ASL.

Although, to our knowledge, there are no previous studies that look systematically at manual co-speech gesture as a predictor for ASL aptitude, McIntire & Snitzer Reilly (1988) examined whether the communicative facial expressions that are naturally used by people who use a spoken language are transferred into ASL facial grammar. Their study concludes that while preexisting affective facial expression does serve as a transition in acquiring non-manual grammar in ASL, the learner must first go through a reanalysis stage in which previous knowledge is processed as being linguistically meaningful. This reanalysis process seems to be necessary both for adults L2 learners and for infant L1 learners.

3. The present study

In our study, we investigate whether other gestural information, besides facial expression, may transfer into the acquisition of some of the linguistic spatial features of ASL and whether previous individual differences in gesturing across subjects will predict any differences in their ability to reach ASL competence. We focus on three specific target structures: 1) first person discourse structures, 2) third person discourse structures, and 3) spatial location.

The first type of structure is the equivalent in ASL of what Tannen (1989) termed as constructed dialogue for spoken languages, in substitution for the older term "direct speech." Constructed dialogue refers to one of the devices that speakers use to engage their audience. It consists of reconstructing a dialogue from memory and reporting it using grammatical first-person. In ASL, the notion of constructed dialogue has been recast as constructed action (Metzger, 1995). A dialogue or action is reconstructed from memory and reported by assuming the character's role, using features of first person discourse. ASL first person discourse incorporates one or more of the following elements: 1) partial or whole use of the body to convey actions; 2) neutral eye gaze (i.e. eye gaze that is not addressed at any member of the audience, but is rather addressed within the surrogate space in which the action is taking place; and 3) facial expression matching the reported action (cf.: Liddell, 1980; Padden 1986, 1990; Meier, 1990, Mather & Thibeault 2002). An example is given in figures 1 and 2. Figure 1 shows the target action, in which a cartoon cat smashes against a wall. Figure 2 shows the narrator using first person discourse to convey the targeted action by using part of his own body to represent the cat.

Figure 1

Figure 2

Actions can also be reported using third person discourse in ASL. In such cases, narrators do not assume the identity of the characters, rather they display their own perspective about the actions of a character or the movements of an object by standing back and gazing at classifier handshapes describing the event, as if watching a scene unfold before their eyes. This is illustrated in figure 3. The target action is the same as the one in figure 1. But here the narrator used third person discourse to display his own perspective of what the cat did by using a right-hand classifier handshape “1” to represent the cat and the classifier handshape “flat 5" to represent the wall. The relative position of his two hands represent the end result of the event.

Figure 3

Setting up the space is also an important aspect of ASL. Characters and objects are assigned specific locations within the signing space. Established locations are consistently indexed and referred to across the discourse.

We will track the development of these three aspects of ASL grammar at the early stage of ASL L2 acquisition and we will look at any possible transfer from previous gestural knowledge. Our hypothesis is that the quality of co-speech gesture in non-signers might predict successful

acquisition of certain spatial aspects of ASL. In particular, we hypothesize that: 1) use of role-shift in gesture might transfer into efficient learning of the elements of first person discourse in ASL; 2) use of classifier-like handshapes in gesture might transfer into efficient learning of the elements of third person discourse in ASL; and 3) ability to clearly and consistently set up the space in gesture might transfer into efficient learning of spatial locations in ASL. Additionally, we hypothesize that some of these skills might develop in relationship to one another.

3. 1. Methods

Subjects

This is a longitudinal study of adult L2 learners of ASL. All subjects were hearing, native speakers of English within an age range of 17-47. They had no previous knowledge of ASL when they began their participation in the study. We tracked their ASL development after eight months since they started learning ASL. A total of eighteen subjects completed the study.

Procedures

The data collection involved two separate sessions. One took place before the subjects started learning ASL and the other one took place eight months after the subjects began learning ASL. In the first session, subjects were asked to watch seven cartoon vignettes and ten short clips from the vignettes. After watching each vignette or clip, they were filmed retelling the action to a partner in English. All subjects were also requested to fill out a background questionnaire that included, among other things, requests for information about their previous linguistic knowledge and expectations and attitudes about ASL learning. In the second session, eight months after the subjects started learning ASL, they were asked to watch the same cartoon vignettes and clips, and they were filmed retelling the stories in ASL. All subjects filled out the background questionnaire again to determine whether their expectations and attitudes about ASL had changed.

Coding

The research team devised a coding sheet to account for 1) use of first person discourse in co-speech gesture (pre-ASL) and in ASL; 2) use of third person discourse in co-speech gesture (pre-ASL) and in ASL; and 3) establishment of locations in co-speech gesture (pre-ASL) and in ASL. The coding sheet included the following measures for each of the above narrative components:

1) First person discourse measures: a) neutral eye gaze: gaze matches entity's eye gaze; b) facial expression matches character's emotion; c) body part(s) movement shows the character's performance.

2) Third person discourse: a) handshape and palm orientation are plausible (that is, iconically clear) to represent the entity's shape when using gesture, b) handshape and palm orientation are correct (matches the appropriate ASL lexicalized handshape/palm orientation) when using ASL; c) ability to use two different handshapes for different entities at the same time.

3) Location: a) locations are established correctly (matching the target cartoon); b) locations are referred to in a consistent manner; c) ability to set up two locations at the same time.

The research team, which includes hearing and Deaf researchers, coded the retelling of one cartoon clip both in English (pre-ASL) and in ASL for each subject. The one clip analyzed involved Sylvester the cat standing on the window ledge looking down at Tweety bird in its cage, also on the window ledge. Sylvester moves his index finger back and forth following Tweety's swinging on its swing. This clip turned out to be ideal because it elicited the use of role shift, classifier use, and the establishment of more than one location in both gesture and ASL. The coding ratings for the selected first person, third person, and location measures in gesture and ASL were transformed into numerical scores that were subsequently used to calculate statistical correlations .

Analyses

Specifically, our analyses looked at 1) which measures correlated with each other within gesture, to see whether any pre-existing gestural skills tend to group together; 2) which measures correlated with each other within ASL, to see whether any of the targeted skills develop together; and 3) we also looked at correlations between any of our measures in gesture and in ASL, to see if an individual's skill in gesture could predict skill development in ASL after two semesters of ASL classes.

3. 2. Results

First person discourse:

Our first person discourse measures did not correlate with each other within gesture. First person role shift attempts (identifiable instances of role-shift use), eye gaze, and facial expressions did not correlate with each other. That is, although subjects used first person discourse strategies in gesture, they did not incorporate all the linguistic elements of first person discourse that are found in ASL,

such as matching expression and neutral eye gaze. This is to be expected since the use of co-speech gesture is not grammatical.

Within ASL, we see a different story. First person discourse attempts correlated with first person facial expressions ($r = .670$, $p = .002$). Additionally, first person facial expressions correlated with first person correct gaze ($r = .600$, $p = .008$). However, first person attempts did not correlate with first person correct eye gaze. That is, first person discourse in ASL was produced with correct facial expression more often than with correct neutral eye gaze. This suggests that linguistic use of eye gaze in first person discourse is harder to acquire than matching facial expression. Nevertheless, a comparison of the correlations among first person measures in gesture and in ASL suggests emerging linguistic nuance in the use of first person discourse (i.e., correct facial expression) at early stages of ASL acquisition.

None of our first person role-shift measures in gesture correlated with any of the first person discourse measures in ASL. The subjects who used role-shift in gesture were not necessarily the same ones who used first person discourse in ASL. At the first stages of ASL, use of first person discourse elements do not seem to be due to transfer from first person discourse abilities in gesture. We could see many of our subjects working to focus on ASL vocabulary items. This may have inhibited their natural use of first person discourse in their narratives.

Third Person discourse:

Within gestures, third person classifier attempts (identifiable instances of classifier-like structures in the subjects' gestures) correlated with third person classifier complexity ($r = .748$, $p = .000$). The more a person uses classifier-like handshapes in gesture, the more complex they tend to be (e.g., the use of two different handshapes simultaneously). Third person classifier attempts also correlated with third person classifier plausible handshapes ($r = .601$, $p = .000$). We interpret this finding to show that while third person classifiers do not show linguistic features in gesture—as one would expect—they do show iconic accuracy.

Correlations for third person discourse measures within ASL show a similar pattern. Third person discourse attempts are correlated with third person discourse complexity ($r = .773$, $p = .001$). In addition, third person discourse attempts are correlated with correct handshape for ASL ($r = .470$, $p = .049$). The more a learner attempts to use third person discourse, the more complex their third person structures tend to be. Learners unskilled at third person discourse tend to avoid using the structure. We conclude that third person discourse is used at an early stage with some degree of

linguistic nuance (subjects are able to use some, but not all of the grammatical features required of third person discourse structures.)

Correlations for third person discourse measures in gesture and ASL reveal a positive correlation between third person attempts in gesture and third person attempts in ASL ($r = 579$, $p = .012$). That is, there is transfer of this feature from gesture to ASL, with an evolution from nonlinguistic iconic gestures to linguistically nuanced forms (e.g. correct handshape in ASL). This suggests that the pre-existing use of classifier-like structures in co-speech gestures might predict early learning of third person discourse structures in ASL.

Space and location variables;

Within gestures, the measures of correct location and location consistency were positively correlated ($r = .567$, $p = .014$). In addition correct location and simultaneous placement of two locations were also correlated ($r = .528$, $p = .024$). This indicates that location variables pattern together within gesture. Subjects who naturally locate elements of the discourse correctly in space also tend to refer to these locations consistently. Additionally, subjects who are precise and consistent setting up their locations can also use more complex location structures and locate different elements of the narrative in relation to one another.

Correct location and location consistency are also positively correlated in ASL ($r = .620$, $p = .006$). No other location variables were correlated with each other in ASL. That is, location variables also pattern together in ASL but less so than in gesture. This might be due to the fact that using location within the linguistic constrains of ASL is harder than using location in spontaneous gesture.

Several correlations were found between location variables in gesture and ASL. The ability to place two simultaneous placement locations in gesture was correlated with the same ability in ASL ($r = .726$, $p = .001$). Location consistency in gesture was also correlated with the simultaneous placement of two locations in ASL ($r = .529$, $p = .045$). It seems, then, that some pre-existing skills in using location in gesture might predict the correct use of some location variables in ASL.

Correlations between Location and Third Person Classifiers;

Interestingly, a number of correlations between location variables and third person discourse variables were found, prompting us to analyze these findings as well. Within gesture, location consistency and third person classifier attempts were correlated ($r = .724$, $p = .001$). The simultaneous use of two locations in gesture was correlated with third person classifier complexity

in gesture (r = .504, p = .033). The number of correct locations in gesture was correlated with third person classifier attempts (r = .680, p = .002) and third person classifier complexity (r = .726, p = .001). It seems that the natural ability to set up space and the use of classifier-like handshapes within that space are related skills in gesture.

There were no such correlations between location and third person classifiers in ASL. Location skills and third person discourse skills seem to develop separately at this early stage of ASL acquisition.

There were some correlations, however, between location and third person discourse structures between gesture and ASL. Location consistency in gesture is correlated with third person discourse attempts in ASL. (r = .730, p = .001). Third person classifier attempts in gesture are correlated with the simultaneous placement of two locations in ASL (r = .565, p = .015). There seems to be a relationship among some abilities to set up space and the use of classifier constructions across gesture and ASL. This again suggests that these may be related skills.

3.3. Summary of skill development and skill transfer;

First person shift is produced with some linguistic nuance early in ASL (i.e., correct body part movement and matching facial expression.) It appears, however, that correct eye gaze for first person discourse develops more slowly in ASL than correct facial expression. We find no evidence of skill transfer from gesture at this early stage of ASL acquisition.

Ability to use third person discourse also develops early in ASL, with some evidence of skill transfer from gesture to ASL. For example, pre-existing ability to use classifier-like shapes in gesture has some predictability for use of third person discourse in ASL, with evolved linguistic nuance in ASL (e.g. correct ASL handshapes.)

Regarding location measures, some location skills already pattern together at an early stage of ASL acquisition (location correct/location consistency). There is some predictability between ability to set up the space in gesture and ability to set up the space in ASL. Additionally, as we saw, there is a relation among several location variables and third person discourse variables both within pre-ASL gesture and across gesture and ASL. We might conclude that pre-existing ability to set up the space in gesture has some predictability for use of third person discourse in ASL. Correspondingly, the ability to use classifier-like shapes in gesture has some predictability for the development of some location variables in ASL

4. Conclusions and further questions;

The reported correlations reveal some interesting patterns regarding the development of certain spatial ASL skills that are central in narrative discourse. While our study included a relatively small sample and one must be cautious in generalizing our results to all learners, we hope these results will generate further questions and stimulate further research about ASL L2 acquisition. For example, while we tracked the acquisition of a few selected skills eight months after the subjects began learning ASL, one might ask if our results will change at a later stage of ASL acquisition. Will the emerging linguistic features found in the subjects' use of location, third person discourse, and first person discourse continue to develop at a later stage, or is there a U learning curve, such as the one found by McIntire & Snitzer Reilly (1988) in their study on facial expression in ASL? Will skills that seem to pattern together (e.g., some location variables) at an early stage continue to pattern together at a later stage, or will they develop separately? For skills that pattern together, will enhancing one during ASL training help in the acquisition of the other (e.g., some location variables and use of third person discourse elements)? Our next step will be to track the same skill variables at a later L2 acquisition stage in order to get a clearer idea about the pace and order of skill development and about the relationships among different skills. Finally, we hope this research can bring insight into the issue of linguistic transfer in L2 acquisition when the L1 and the L2 have different modalities. Thus, while the linguistic spatial skills that we considered in this study have no parallel in the spoken modality, the gestures that accompany speech may reveal pre-existing spatio-visual skills that might facilitate or predict the development of some spatial skills in ASL. Looking at gesture as a possible component of linguistic transfer might prove fruitful not only in predicting aptitude in sign language acquisition, but also in devising teaching strategies and methodologies that may tap into the learners' preexisting visuo-spatial skills.

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