Pointing and Verb Modification: the expression of semantic roles in the Auslan corpus

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Abstract

As part of a larger project investigating the grammatical use of space in Auslan, 50 texts from the Auslan Archive Project Corpus were annotated and analysed for the spatial modification of verbs to show semantic roles. Data for the corpus comprise the Sociolinguistic Variation in Auslan Project (SVIAP) and the Endangered Languages Documentation Project (ELDP). In this paper, 20 personal narratives were analysed—10 from SVIAP and 10 from ELDP—as well as 30 retellings of two Aesop's fables (16 of "The Boy Who Cried Wolf" and 14 of "The Hare and the Tortoise"). Each sign or meaningful gesture in the texts was identified and annotated in ELAN. These signs were then classified into word class, and the nouns and verbs tagged for whether they had the potential to be modified spatially. Next, the indicating nouns and verbs were annotated as to whether or not their spatial modification was realized. In this paper, we discuss the use of the ELAN search functions across multiple files in order to identify the proportion of sign types in the texts, the frequency with which indicating verbs are actually modified for space and the influence of the presence of a pointing sign adjacent to the verb.

1. Aims and Background

One of the most salient and interesting aspects of the grammar of signed languages is the use of space to track referents through discourse. One way in which this has been observed is the spatial modification of lexical verbs to show semantic roles and participants. Many previous studies have noted this and generally—when a verb has been identified as modifiable—the modification has been assumed to be obligatory (Aronoff, Meir, Padden, & Sandler, 2003; Meier, Cormier, & Quinto-Pozos, 2002; Meir, 2002; Neidle, Kegl, MacLaughlin, Bahan, & Lee, 2000; Padden, 1988; Padden, 1990). The alternative view, and one that seems to pattern better with this data, is that the modifications are gestural and the signs are a combination of morphemes and gestures (Engberg-Pedersen, 1993; Liddell, 2000, 2002, 2003b). A serious problem, however, with many previous reports on spatial modification of verbs is that they were not based on data of usage patterns, but rather native speaker intuitions.

Part of the reason for this lack of data of usage patterns was the technology available at the time of the research. Prior to the digital age, the collection of large amounts of data was difficult and expensive, as was the storage and accessibility of such data. Even more challenging, however, was the task of transcribing or annotating the data and then searching it for the relevant aspects of the grammar and their co-occurrence with other features.

These problems are now being overcome: data can easily and affordably be filmed and stored digitally; annotations can occur in software with a machine readable format; and as such, searches can be carried out by computers on single or multiple texts at the same time, thus decreasing human error in data analysis and saving countless hours of manual labour.

As part of a larger project investigating the grammatical use of space in Auslan, 50 texts from the Auslan Corpus have been annotated and analysed for the spatial modification of verbs to show semantic roles. Using ELAN (EUDICO Linguistic Annotator) software, which allows for multiple tiers of annotations to be time aligned with multimedia files, these texts have been analysed for:

a) the number and types of verbs used;
b) the proportion of modifiable verbs which have actually been modified in the text; and
c) the influence of pointing signs on the modification.

The hypothesis is that the presence of at least one adjacent pointing sign would decrease the likelihood of the sign being modified. Linked to that, it is expected that for indicating verbs with adjacent pointing signs, a lesser proportion would be modified than what occurred when there was no adjacent pointing sign.

In this paper, I discuss some of the features of ELAN that have been used to enable a search of a large amount of data with a relatively small amount of labour. I will first discuss the methodology used, then some of our previous and current results before discussing conclusions that can be drawn.

2. Methodology

2.1 Data

Data for this paper come from the Auslan Archive Project Corpus, which consists of two large corpora: the Sociolinguistic Variation in Auslan Project (SVIAP) and the Endangered Languages Documentation Project (ELDP). The SVIAP corpus is made up of films of 211 participants from all over Australia, resulting in 150 hours of edited footage of free conversation, a more formal interview, and lexical elicitation tasks. The ELDP corpus has 150 hours of edited video from 100 participants all over Australia (many the same as filmed for the SVIAP corpus). The ELDP data consists of the retelling of a

narrative, responding to formal interview questions, an attitude questionnaire, a spontaneous narrative, and some elicitation tasks for specific linguistic features. Participants were filmed by and interacted with other native signing deaf adults.

For this paper, ten spontaneous narratives were sourced from the SVIAP corpus. The second set of texts—from the ELDP corpus—consisted of 10 spontaneous personal recounts of a memorable event, as well as 30 retellings of 2 Aesop's fables (16 of "The Boy Who Cried Wolf" and 14 of "The Hare and the Tortoise"). Participants were given an English version of the fable a week before filming and were told they would retell the story a week later.

The texts from both corpora were recorded on digital videotape, annotated using ELAN software, and analysed with ELAN and Excel. This process is explained below.

2.1 Analysis

In the ELAN file, users are able to specify a limitless number of tiers on which to annotate different features of a text. For this project, on the first two tiers (one for each hand), each of the texts were given a shallow gloss: that is, each sign was identified and labeled with an English "equivalent". This was able to be done consistently due to the existence of the Auslan Lexical Database (for more information on the database and this process, see Johnston, these proceedings). This allowed for accurate counting of lexicalized signs for frequency counts of types and tokens.

In this first stage of glossing, every meaningful manual action was annotated, including: lexical signs from the Lexical Database, depicting signs, gestures, and points. Points were coded as either:

a) a personal pronoun;
b) a possessive pronoun;
c) a demonstrative;
d) a locative; or
e) a point to a buoy handshape (Liddell, 2003).

A sign counted as a point regardless of the handshape used if it was used in a pointing manner. This was important as many point signs occurred with alternate handshapes due to the assimilation of the features of surrounding signs.

First person singular pronouns as well as points to buoy handshapes were clear as their form is different to other handshapes. However, since the form of most other points is identical regardless of whether they are referring to a non-present referent or a location, it was often impossible to be sure of the meaning of a signer's point. Thus, in this first parse of the data, many points were coded simply as unclear.

A second tier dealt with the grammatical class of each sign as well as its spatial potential. Verbs were divided into plain verbs (those unable to be moved about or located in space), depicting verbs (classifier signs), and indicating verbs (directional or locatable). The table below defines each of these categories.

CATEGORY	EXPLANATION
depicting verb	A verb created on the spot that is not found in the dictionary or lexical database (classifier signs).
plain verb	A lexical verb that cannot physically be moved about in space; usually it is body anchored in some way.
indicating verb-directional	A lexical verb that can be moved meaningfully through space to show the semantic role of at least one participant.
indicating verb/noun-locatable	A lexical verb that can be located meaningfully in space, though not moved through space. Often because it has no path movement.

Table 1: Sign classes for spatial modifiability

Next there was a tier on which indicating verbs were marked for whether their spatial potential was realized: that is, were they moved meaningfully in space to show the semantic role of at least one participant. There were three possibilities: modified, not modified, or congruent—that is, citation in form, but that form was consistent with the spatial arrangement. These are explained in Table 2 below.

SPATIAL MODIFICATION	EXPLANATION
modified	The sign was modified spatially, i.e., it was not the citation form of a sign.
unmodified	The sign was spatially unmodified, i.e., it was produced in the citation form and was not congruent with the spatial framework. If it had been modified, it would/should have looked different to the citation form.
congruent	Of those unmodified forms, some were congruent with the spatial arrangement already set up. That is, any modification (if it were really there) would be 'invisible' because it would still look like the citation form.

Table 2: Codes for the realization of spatial potential.

Once all of the annotations were complete, search procedures were carried out through ELAN. Searches were carried out two ways: searching individual files in detail; or conducting a structured search on all 50 files at once in less detail.

In a previous round of the project (de Beuzeville et al., forthcoming; Johnston et al., 2007) searches were carried out on each file individually, for the following features:

a) the number of annotations per file;
b) a type/token analysis;
c) an analysis of the frequency of each type;
d) the number (and percentage) of each word class: and in particular, the spatial potential of nouns and verbs;
e) the proportions of modifiable signs which were actually modified; and
f) how often a period of constructed action (role shift) co-occurred with modified and unmodified signs.

These figures were all exported into Excel, those for all texts added together and calculations carried out. In addition, all tokens with all information attached were run through Varbrul for an analysis of statistical significance.

For this paper, the searching was conducted on all 50 files together, through the new structured search across multiple files option in ELAN. All indicating verbs were

identified, as well as the sign or gesture that occurred directly before or after. Each token of an indicating verb was also marked as modified, not modified or congruent. This data was then exported to Excel and all instances of pointing signs occurring directly before or after an indicating verb were identified and counted, in order to calculate whether the co-occurrence of a point and an indicating verb had an effect on its modification.

For this paper, the following analyses were carried out in Excel:

a) a comparison of indicating verbs with or without a point sign adjacent and whether it influenced the modification;
b) a comparison of all of the verb signs with point signs adjacent and whether they were more likely to occur with verbs that were modified, unmodified or congruent; and
c) the frequency of each type of point sign.

3. Results

Despite the claim that indicating verbs in signed languages are obligatorily modified ('inflected') with respect to loci in the signing space in order to show person 'agreement', we found that these verbs are actually only spatially modified about a third of the time (de Beuzeville et al., forthcoming; Johnston et al., 2007).

Altogether the data being analysed contained just over 8,500 sign tokens, with about 40,000 annotations in total. Below is a figure which shows the amount of tokens for each type of verb—in terms of their spatial potential—as a proportion of all verbs. As can be seen, over half of all lexical verbs which are able to show semantic roles through spatial modification were not actually modified (61% of all indicating verbs).

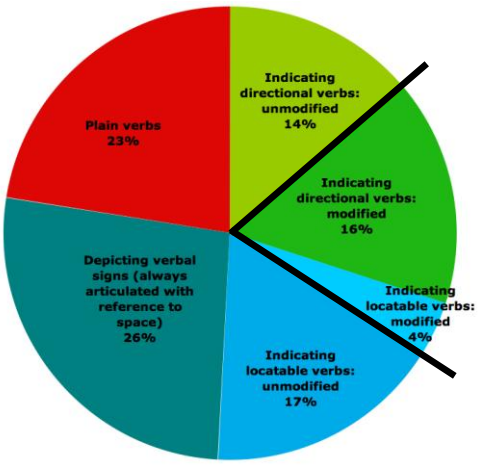

Figure 1: Proportions of types of verbs and the realization of their spatial potential.

In previous analyses of the data by Varbrul, the following factors were found to account for the variability in verb modification (de Beuzeville, et al., forthcoming; Johnston et al., 2007):

a) indicating signs that are directional favour modification compared to locatable signs;
b) locatable verb signs favour spatial modification compared to locatable noun signs;
c) the five most frequent indicating verbs favour modification compared to other indicating verbs; and
d) the presence of constructed action significantly favoured spatial modification, especially with modified verbs.

In this stage of the project, the focus is on what effect adjacent points may have on the likelihood of modification. The analysis showed that the presence of pointing did indeed have some effect on the proportion of tokens modified. As can be seen from Figure 2 below, indicating verbs were modified 41% of the time when there was no adjacent point, and this went down to 34% when there was. Unmodified indicating verbs went from 43% without a point sign to 47% with an adjacent point. These changes are in the direction predicted, but may not be statically significant. Interestingly signs that were congruent followed the pattern of unmodified signs.

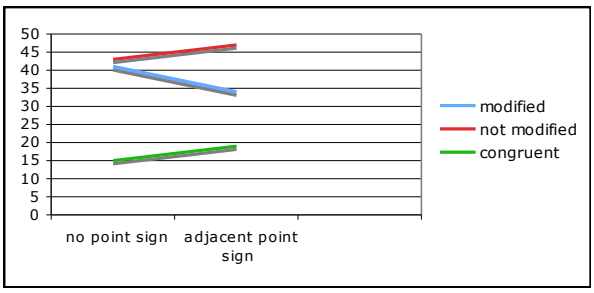

Figure 2: modification of indicating verbs with and without adjacent point signs

Further, modified signs were less likely in general to have a point sign adjacent. Figure 3 shows that of all modified indicating verbs, only 19% had an adjacent point, whereas for the indicating verbs that were not modified that figure was 24%. Congruent signs had an adjacent point sign 26% of the time, again patterning most similarly to the not modified signs.

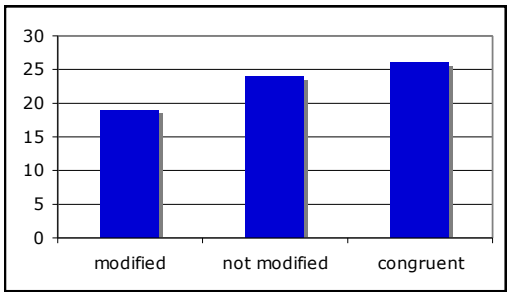

Figure 3: Proportion of modified, not modified, and congruent indicating verbs that occurred with an adjacent pointing sign.

Clearly, the type of point needs to be taken into account, since not all points give information about the semantic role of the participants of the verb. The hypothesis is that only those that do mark the semantic roles would affect modification of verbs. Figure 4 below shows the frequency of the main 3 types of points (accounting for 70% of the data): first person singular pronouns (39%), third person singular pronouns (15%) and demonstratives and locatives (16%). Approximately 14% of tokens were unclear as to their semantic function,

and the remaining 16% are made up of other types of points.

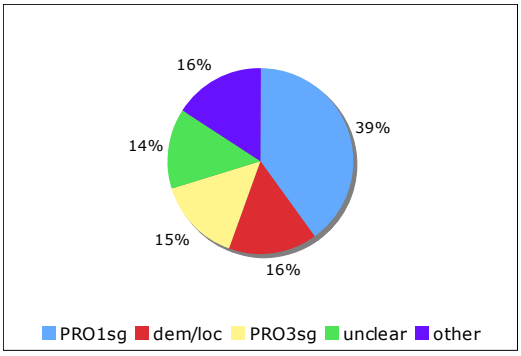

Figure 4: The frequency of different types of pointing signs

The next step in the project is to analyze the effects of individual types of points on modification, as well as to look at directional and locatable verbs separately. These are much needed analyses in order to be able to rely on the finding that adjacent points influence the modification of indicating verbs.

These results help determine where and when the spatial modification of indicating verbs is used in natural Auslan texts (and potentially other signed languages) and they indicate that the presence of an adjacent point appears to have an effect on the modification of indicating verbs, be they locatable or directional.

4. Conclusion

The data presented above is an attempt to account for variability of the modification of indicating verbs. The study needs, however, to go further before any firm conclusions can be drawn.

The immediate priorities of the project are to:

a) analyze the effect of different types of points on modification of indicating verbs;
b) analyze the verbs that are affected according to whether they are locatable or directional; and
c) carry out tests of statistical significance.

In addition, it will be necessary in the future to look at a larger environment than the sign before or after in order to see whether points further away influence modification as well, and to add more data and from non-narrative text types. It will also be necessary to decide how best to deal with signs that are congruent: that is, whether they should be assumed to be modified, treated as unmodified, or left out of the analysis as ambiguous examples.

Whatever the factors that affect the modification of indicating signs, the fact remains that they are not modified obligatorily. Thus, the data are not compatible with the view that spatial codings are highly grammaticalised or a system of verb agreement, since such systems of agreement should allow for referential cohesion and referent tracking, be head marked versus dependent-marked, obligatory and grammaticalised (that is, bleached of meaning).

Based on this data, we suggest that 1) the degree of grammaticalization of indicating verbs may not be as great as once thought and 2) the apparent non-obligatory or variable use of spatial modifications may be partly accounted for by the presence of pointing signs—very frequent in signed texts—before or directly after the verb.

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