



*The distribution of functional projections in ASL: Evidence from overt expressions of syntactic features**

Carol Neidle and Dawn MacLaughlin, Boston University
Workshop on the mapping of functional projections. Venice International University.

January 29-30, 1999

Plan for this talk:

I. Introduction

II. Background about ASL

- Phonology
- Morphology
- Syntax: the state of the art
 - Particular challenges for linguistic research
 - Sociolinguistic considerations

III. Mapping the functional architecture

- Basic sentence structure
- Non-manual syntactic markings as expressions of syntactic features
- Functional structure
 - Tense
 - Agreement
 - ◆ Spatial representation of ϕ -features
 - ◆ Non-manual expression of ϕ -features
 - ◇ within DP
 - ◇ within the clause
 - Aspect

IV. Conclusions

I. Introduction

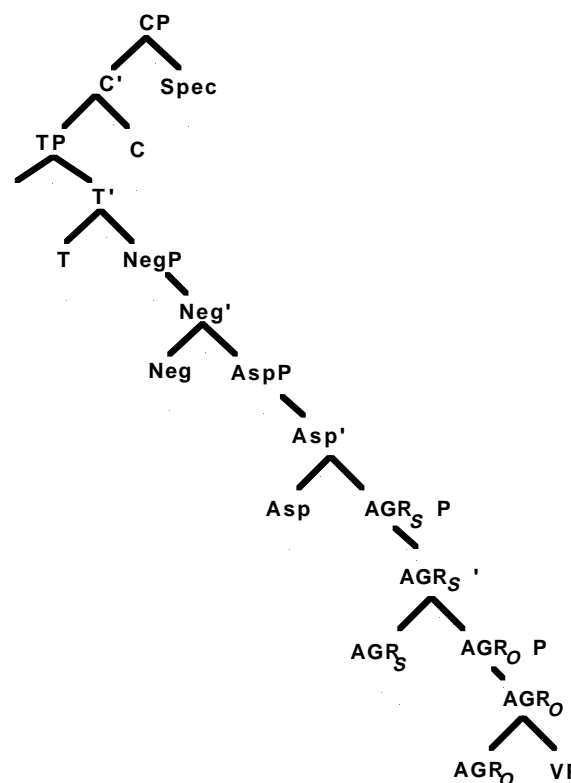


Figure 1: Structure of a transitive clause

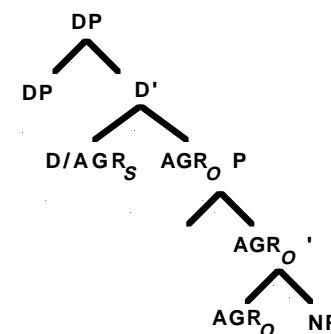


Figure 2: Structure of a possessive DP

*We are grateful for funding from the National Science Foundation, grants #SBR-9410562, #SBR-9729010, #IIS-9528985.

II. Background about ASL

Phonology and Morphology

Equivalents of phonemes:

particular hand shapes,
hand orientations,
places of articulation
relative to the body, and
movement characteristics.

Minimal pair:



Figure 3: FATHER vs. FINE

Syntax: the state of the art

Disagreements about data with respect to the most basic syntactic constructions

Particular challenges for linguistic research:

- Lack of written representation
- Reliance on English glosses
(deficient in many respects; difficult to reconstruct signed sentence)
- Lack of access to video data
- Lack of tools for analysis of video data
- Difficulties in data collection related to sociolinguistic factors



Figure 4: SignStream See <http://www.bu.edu/asllrp/SignStream>.

Sociolinguistic context

- ~10% of deaf children are born to Deaf signing parents (--> native signers)
- education: oral approach, English-based artificial sign systems
- stigmatization of ASL

Challenges for data collection

- to isolate language used by Deaf signers among themselves
- to minimize influence from English

III. Mapping the functional architecture

Basic sentence structure

SVO; other surface word orders attributable to prevalence of topicalizations, left dislocations, null arguments, right dislocations, and sentence-final tags.

Non-manual markings

Linguistic vs. non-linguistic
functions of non-manual expressions

Neurolinguistic research:

affective expressions processed in right hemisphere; linguistic expressions processed in left; differential impairment of affective and linguistic non-manual expressions (Corina 1989; Kegl & Poizner 1991, 1997, Poizner & Kegl 1992).

Acquisition research:

linguistic and affective expressions acquired differentially (McIntire & Reilly 1988, Reilly & Bellugi 1996, Reilly, McIntire, & Bellugi 1990)

Non-manual syntactic markings

- Non-manual syntactic markings are frequently associated with syntactic features residing in the heads of functional projections (e.g., +neg, +y/n, +wh, ϕ -features).

- The non-manual marking may spread over the c-command domain of the node with which it is associated (reflecting relations at Spell-Out).

This spread is optional if manual material is available locally (e.g., in head or specifier position).

However, if no manual material is available locally, then the marking spreads obligatorily so that it may be coarticulated with manual material.

- The intensity of the non-manual marking is greatest at the node of origin, and decreases as distance from the source increases.

Negative constructions

Optional spread over c-command domain:

(1) $\overline{\text{neg}}$
JOHN NOT BUY HOUSE

'John is *not* buying a house.'

(2) $\overline{\text{neg}}$
JOHN [NOT [BUY HOUSE]_{VP}]_{NegP}

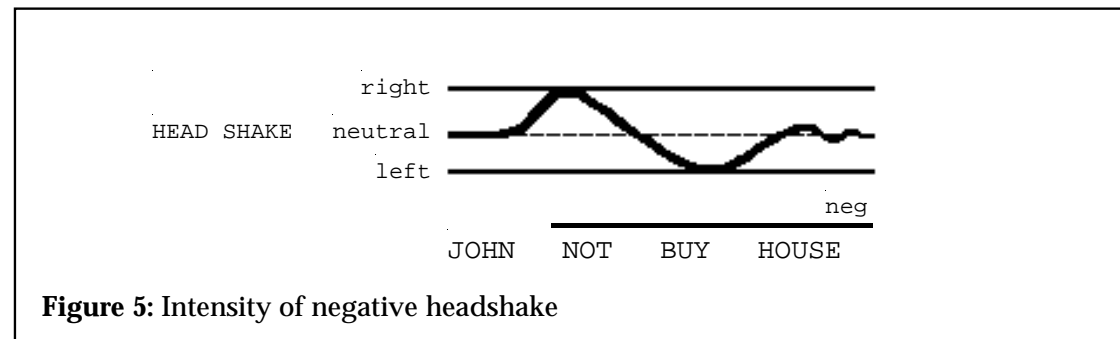
'John is not buying a house.'

Obligatory spread (no manual material available locally):

(3) $\overline{\text{neg}}$
JOHN BUY HOUSE

'John is not buying a house.'

Intensity: greatest at Neg node.



Wh-constructions

<i>Wh-phrases in Spec, CP</i>	<i>Wh-phrases in situ</i>
Spread of non-manual material over IP is <i>optional</i>	Spread of non-manual material over IP is <i>obligatory</i>
<p style="text-align: right;">_____ wh</p> <p>(4) [t_i HATE JOHN]_{IP} WHO_i</p> <p style="text-align: right;">_____ wh</p> <p>(5) [t_i HATE JOHN]_{IP} WHO_i</p> <p style="text-align: center;">‘Who hates John?’</p> <p style="text-align: right;">_____ wh</p> <p>(8) [JOHN SEE t_i YESTERDAY]_{IP} WHO_i</p> <p style="text-align: right;">_____ wh</p> <p>(9) [JOHN SEE t_i YESTERDAY]_{IP} WHO_i</p> <p style="text-align: center;">‘Who did John see yesterday?’</p>	<p style="text-align: right;">_____ wh</p> <p>(6) [WHO HATE JOHN]_{IP}</p> <p style="text-align: right;">_____ wh</p> <p>(7a) * [WHO HATE JOHN]_{IP}</p> <p style="text-align: right;">_____ wh</p> <p>(7b) * [WHO HATE JOHN]_{IP}</p> <p style="text-align: center;">‘Who hates John?’</p> <p style="text-align: right;">_____ wh</p> <p>(10) [JOHN SEE WHO YESTERDAY]_{IP}</p> <p style="text-align: right;">_____ wh</p> <p>(11a) * [JOHN SEE WHO YESTERDAY]_{IP}</p> <p style="text-align: right;">_____ wh</p> <p>(11b) * [JOHN SEE WHO YESTERDAY]_{IP}</p> <p style="text-align: center;">‘Who did John see yesterday?’</p>

Distribution: Spread is obligatory when there is no manual material available locally with which the non-manual wh-marking associated with the +wh feature in C can be expressed.

Intensity: Intensity is greatest near the source of the +wh feature, i.e., at the end of the sentence.

Functional Structure

Tense



Figure 6: Articulation of adverbial vs. tense marker

Many tense markers are related to adverbial forms. Nonetheless there are differences in articulation and distribution. Adverbials frequently occur sentence-initially or sentence-finally, while tense markers occur between the subject and negation (if present, and with which the tense marker may contract), in complementary distribution with modals.

(12) JOHN WILL GO

'John will go.'

(13) JOHN #EX LIKE CHOCOLATE

'John used to like chocolate.'

(14) JOHN SHOULD GO

'John should go.'

(15) JOHN SHOULD NOT GO

'John should not go.'

(16) JOHN SHOULD^{neg}NOT GO

'John shouldn't go.'

(17) JOHN WILL^{neg}NOT GO

'John won't go.'

(18) JOHN EAT

'John eats/is eating.'

(19) Tomorrow John goes to Venice. (English)

(20) Demain, je pars pour Paris. (French)

'Tomorrow, I leave for Paris.'

Agreement

◆ Spatial representation of ϕ -features



Figure 7: Determiner / pronominal



Figure 8: Possessive



Figure 9: Reflexive/emphatic



Figure 10: Manual expression of verb agreement: beginning and end point of GIVE

Phi-features expressed spatially
 Person features
 primary distinction: 1st vs. non-1st
 multiple distinct non-1st persons




Figure 11: Non-manual expressions of subject agreement (head tilt) and object agreement (eye gaze) with the verb GIVE

Manual agreement inflections

Verbs: different morphological classes

Agreeing verbs: GIVE, SHOOT
 Plain verbs: LOVE

(21) JOHN_i _iSHOOT_j FRANK_j
 'John shoots Frank.'

(22) JOHN LOVE [IX WOMAN]_{DP}
 'John loves the woman.'

Nouns show similar distinctions

Agreeing nouns: HOUSE
 Plain nouns: BOY

Non-manual expressions of agreement

Like the syntactic features +neg and +wh, ϕ -features have non-manual expressions:

head tilt
 eye gaze

These non-manual agreement markings are optional.

◇ Non-manual expression of ϕ -features within DP

Non-possessive DPs



Without spread

\underline{eg}_i
(23) IX_i OLD MAN

\underline{ht}_i
(25) IX_i OLD MAN

\underline{ht}_i
 \underline{eg}_i
(27) IX_i OLD MAN

'the old man'

With spread

_____ \underline{eg}_i
(24) IX_i OLD MAN

_____ \underline{ht}_i
(26) IX_i OLD MAN

_____ \underline{ht}_i
_____ \underline{eg}_i
(28) IX_i OLD MAN

'the old man'

Obligatory spread if no lexical (manual) determiner is present:

_____ \underline{ht}_i
_____ \underline{eg}_i
(29) OLD MAN

Possessive DPs

_____ \underline{ht}_i _____ \underline{eg}_j
(30) JOHN POSS $_i$ FRIEND $_j$



_____ \underline{ht}_i
_____ \underline{eg}_j
(31) JOHN POSS $_i$ FRIEND $_j$

'John's friend'



Figure 12: example 30 (head tilt does not spread)

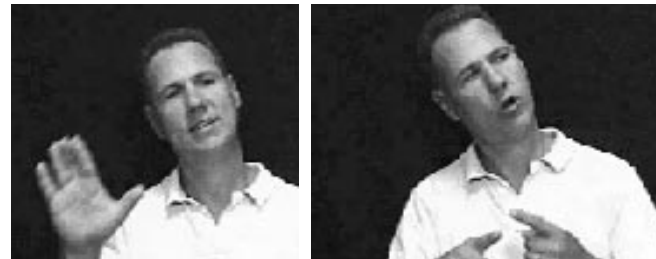


Figure 13: example 31 (head tilt spreads)

◇ Non-manual expression of ϕ -features within the clause

Intransitive clauses

Spread obligatory

_____ \underline{ht}_i
(32) JOHN $_i$ BATHE

_____ \underline{eg}_i
(33) JOHN $_i$ BATHE

_____ \underline{eg}_i
_____ \underline{ht}_i
(34) JOHN $_i$ BATHE

'John bathes'

Transitive clauses

_____ \underline{ht}_i
_____ \underline{eg}_j
(35) JOHN $_i$ SHOOT $_j$ FRANK $_j$

'John shoots Frank.'

_____ \underline{ht}_i
_____ \underline{eg}_j
(36) JOHN $_i$ LOVE MARY $_j$

'John loves Mary.'


(see Figure 11 on previous page)

Licensing of null arguments


A null argument is licensed by an overt expression of subject or object agreement.

ASL allows null subjects and objects, with both plain and agreeing verbs. With verbs that have overt agreement morphology, null subjects and objects are licensed regardless of whether the optional non-manual agreement markings are present. However, with plain verbs, null arguments are allowed only in the presence of non-manual expressions of agreement.

(37) pro_i $_i$ SHOOT $_j$ FRANK $_j$
 ‘(He/she) shoots Frank.’

(38) FRANK $_i$ $_i$ SHOOT $_j$ pro_j 
 ‘Frank shoots (him/her).’

$_____$ ht_i
 $_____$ eq_j
 (39) pro_i [$_____$]_{AGR-Si} [$_____$]_{AGR-Oj} LOVE MARY $_j$
 ‘(He/she) loves Mary.’

$_____$ ht_i
 $_____$ eq_j 
 (40) JOHN $_i$ [$_____$]_{AGR-Si} [$_____$]_{AGR-Oj} LOVE pro_j
 ‘John loves (him/her).’

(41) * pro LOVE MARY

(42) * JOHN LOVE pro

(43) JOHN LOVE MARY
 ‘John loves Mary.’

	Intransitive	Transitive
DP	$_____$ ht_i $_____$ eq_i [IX _{det}] _{AGRi} NP $_i$	$_____$ ht_i $_____$ eq_j DP $_i$ [POSS] _{AGRi} [$_____$] _{AGRj} NP $_j$
Clause	$_____$ ht_i $_____$ eq_i DP $_i$ [$_____$] _{AGRi} V	$_____$ ht_i $_____$ eq_j DP $_i$ [$_____$] _{AGRi} [$_____$] _{AGRj} V DP $_j$

Figure 14: Parallelisms between transitive/intransitive noun phrases and clauses

Note: Difference in obligatory spread of head tilt within transitive clause vs. optional spread of head tilt in DP follows from existence of manual material within the agreement head of DP.

Consistent with similar crosslinguistic findings (see Abney 1987:chapter 2 on Yup'ik, Bergsland & Dirks 1981 on Aleut, Bittner & Hale 1996:60 on Inuit and other ergative languages, e.g.).

Relative ordering of TP and AgrP

$_____$ ht_i
 neg $_____$ eq_j
 (44) JOHN $_i$ WILL NOT [$_____$]_{AGR-Si}[$_____$]_{AGR-Oj} VISIT MOTHER

We conclude that tense and agreement projections are distinct and that TP dominates the agreement projections.

Aspect

- modulation of the verb
examples: predispositional, susceptive, continuative, incessant, frequentative aspect
(see Klima and Bellugi 1979)

- lexical 'perfect' marker: FINISH

(45) JOHN_i FINISH [_{AGR-Si}] [_{AGR-Oj}] VISIT_j MARY_j

_____ head tilt_i
_____ eye gaze_j

'John has visited Mary.'

(46) JOHN NOT FINISH READ BOOK

_____ neg

'John hasn't read the book.'

We conclude that the (perfect) aspect projection is distinct from and dominates the agreement projections.

IV. Conclusions

Conclusions based on the distribution and intensity of non-manual expressions of syntactic features (which provide evidence of the boundaries of functional projections and the location of functional heads):

- Status of agreement features

Agreement features are like other syntactic features in having non-manual correlates that obey the same generalizations about distribution and intensity.

- Status of agreement projections

Agreement features head functional projections distinct from tense and aspect.

- Dual representation of agreement features

There is evidence for morphological agreement features associated with lexical items (manifested by manual agreement inflection) as well as agreement features in functional heads.

- Parallels between transitive/intransitive DP and TP

With respect to the expression and distribution of non-manual agreement markings, possessive DPs pattern with transitive clauses while non-possessive DPs pattern with intransitive clauses. The one difference between DP and TP is that DP may have manual material in its highest agreement head, resulting in optional spread of the associated non-manual agreement marking.

- Relative ordering of functional projections in the clause

See figure 1.

TP > NegP > AspP > Agr_SP > Agr_OP > VP

References

1. Related publications from the American Sign Language Linguistic Research Project, containing greater descriptive detail and more extensive argumentation. (For more information, see <http://www.bu.edu/asllrp>; many of our publications are available over the Internet, as are video examples.)

Aarons, D. (1994) *Aspects of the Syntax of American Sign Language*. Doctoral dissertation, Boston University, Boston, MA.

Aarons, D., B. Bahan, J. Kegl, and C. Neidle (1995) Lexical Tense Markers in American Sign Language. In K. Emmorey, and J. Reilly (eds), *Language, Gesture, and Space*. Hillsdale, NJ: Lawrence Erlbaum, 225-253.

Bahan, B. (1996) *Non-Manual Realization of Agreement in American Sign Language*. Doctoral dissertation, Boston University, Boston, MA.

Bahan, B., J. Kegl, D. MacLaughlin, and C. Neidle (1995) Convergent Evidence for the Structure of Determiner Phrases in American Sign Language. In L. Gabriele, D. Hardison, and R. Westmoreland (eds), *FLSM VI: Proceedings of the Sixth Annual Meeting of the Formal Linguistics Society of Mid-America*, Bloomington, Indiana: Indiana University Linguistics Club, 1-12.

MacLaughlin, D. (1997) *The Structure of Determiner Phrases: Evidence from American Sign Language*. Doctoral dissertation, Boston University, Boston, MA.

Neidle, C., B. Bahan, D. MacLaughlin, R.G. Lee, and J. Kegl (1998) Realizations of Syntactic Agreement in American Sign Language: Similarities between the Clause and the Noun Phrase. *Studia Linguistica* 52:3, 191-226.

Neidle, C., J. Kegl, B. Bahan, D. Aarons, and D. MacLaughlin (1997) Rightward Wh-Movement in American Sign Language. In D. Beerman [sic], D. LeBlanc, and H. van Riemsdijk (eds), *Rightward Movement*. Amsterdam: John Benjamins, 247-278.

Neidle, C., J. Kegl, D. MacLaughlin, B. Bahan, and R.G. Lee (in press, expected 1999) *The Syntax of American Sign Language: Functional Categories and Hierarchical Structure*. Cambridge, MA: The MIT Press.

2. For a different proposal concerning wh-movement in ASL, see: Petronio, K. and D. Lillo-Martin (1997) WH-movement and the position of spec-CP: Evidence from American Sign Language. *Language* 73:1, 18-57.

as well as our replies:

Neidle, C., D. MacLaughlin, R.G. Lee, B. Bahan, and J. Kegl (1998, in press) The Right(ward) Analysis of Wh-movement in ASL: A Reply to Petronio and Lillo-Martin 1997. *Language* 74:4, 125-137.

Neidle, C., D. MacLaughlin, R.G. Lee, B. Bahan, and J. Kegl (1998) Wh-Questions in ASL: A Case for Rightward Movement. ASLLRP Report no. 6, Boston University, Boston, MA.

3. For a different account of agreement and the licensing of null arguments in ASL, see:

Lillo-Martin, D. (1986) Two Kinds of Null Arguments in American Sign Language. *Natural Language and Linguistic Theory* 4:415-444.

4. For a different view of word order and the (non-)existence of hierarchical structure in ASL, see:

Bouchard, D. and C. Dubuisson (1995) Grammar, order & position of wh-signs in Quebec Sign Language. *Sign Language Studies* 87:99-139.

as well as our reply:

Kegl, J., C. Neidle, D. MacLaughlin, J. Hoza, and B. Bahan (1996) The Case for Grammar, Order and Position in ASL: A Reply to Bouchard and Dubuisson. *Sign Language Studies* 90:1-23.

5. For excellent descriptive work on non-manual markings, see:

Baker-Shenk, C. (1983) *A Micro-analysis of the Nonmanual Components of Questions in American Sign Language*. Doctoral dissertation, University of California, Berkeley.

6. Additional references:

Abney, S. P. (1987) *The English noun phrase in its sentential aspect*. Doctoral dissertation, MIT.

Baker, M. C. (1988) *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago Press.

- Bergsland, K. and M. Dirks. (1981) *Atkan Aleut School Grammar*. University of Alaska: National Bilingual Materials Center.
- Belletti, A. (1990) *Generalized verb movement*. Turin: Rosenberg & Sellier.
- Bittner, M. and K. Hale (1996) The Structural Determination of Case and Agreement. *Linguistic Inquiry* 27:1,1-68.
- Chomsky, N. (1991) Some Notes on Economy of Derivation. In R. Freidin (ed), *Principles and Parameters in Comparative Grammar*. Cambridge, MA: The MIT Press, 417-454.
- Chomsky, N. (1995) *The Minimalist Program*. Cambridge, MA: The MIT Press.
- Cinque, G. (forthcoming) *Adverbs and functional heads: a cross-linguistic perspective*. New York: Oxford University Press.
- Corina, D. P. (1989) Recognition of Affective and Non-canonical Linguistic Facial Expressions in Deaf and Hearing Subjects. *Brain and Cognition* 9:227-237.
- Kayne, R. S. (1994) *The Antisymmetry of Syntax*. Cambridge, MA: The MIT Press.
- Kegl, J. and H. Poizner (1991) The Interplay between Linguistic and Spatial Processing in a Right Lesioned Signer. *Journal of Clinical and Experimental Neuropsychology* 13:38-39.
- Kegl, J. and H. Poizner (1997) Crosslinguistic/Crossmodal syntactic consequences of left-hemisphere damage: Evidence from an aphasic signer and his identical twin. *Aphasiology* 11:1, 1-37.
- Klima, E. S. and U. Bellugi (1979) *The Signs of Language*. Cambridge, MA: Harvard University Press.
- Liddell, S. K. (1980) *American Sign Language Syntax*. The Hague: Mouton.
- McIntire, M. L. and J. S. Reilly (1988) Nonmanual Behaviors in L1 and L2 Learners of American Sign Language. *Sign Language Studies* 61:351-375.
- Ouhalla, J. (1991) *Functional Categories and Parametric Variation*. London/New York: Routledge.
- Padden, C. A. (1988) *Interaction of Morphology and Syntax in American Sign Language*. New York: Garland Publishing.
- Perlmutter, D. (1991) The Language of the Deaf. New York Review of Books, March 28, 65-72.
- Perlmutter, D. 1992. Sonority and syllable structure in American Sign Language. *Linguistic Inquiry* 23:407-442.
- Poizner, H. and J. Kegl (1992) The Neural Basis of Language and Motor Behaviour: Perspectives from American Sign Language. *Aphasiology* 6:219-256.
- Pollock, J.-Y. (1989) Verb Movement, UG, and the structure of IP. *Linguistic Inquiry* 20:365-424.
- Pollock, J.-Y. (1997) Notes on clause structure. In L. Haegeman (ed), *Elements of Grammar*, Dordrecht: Kluwer, 237-279.
- Reilly, J. S. and U. Bellugi (1996) Competition on the Face: Affect and Language in ASL Motherese. *Journal of Child Language* 23:1, 219-239.
- Reilly, J. S., M. L. McIntire, and U. Bellugi (1990) Faces: The Relationship Between Language and Affect. In V. Volterra and C.J. Erting (eds), *From Gesture to Language in Hearing and Deaf Children*, New York: Springer-Verlag, 128-141.
- Rizzi, L. (1997) The Fine Structure of the Left Periphery. In L. Haegeman (ed), *Elements of Grammar*. Dordrecht: Kluwer, 281-337.

Note about the photographs: The photos used here are copyrighted, taken from the following sources:

Figures 3, 4, 6, 8 from Neidle, Kegl, MacLaughlin, Bahan, and Lee (in press, expected 1999).

Figures 9, 12, 13 are from Neidle, Bahan, MacLaughlin, Lee, and Kegl (1998).

Figures 5, 10, 11 are taken from Bahan (1996).

Figure 7 is taken from Bahan, Kegl, MacLaughlin, and Neidle (1995).