



# RRG Mapping of Complex Sentence Constructions with Simultaneous Units in German Sign Language (DGS)

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Elena Jahn



Hello everyone and thank you for being at my talk.  
Today, I'll present a RRG analysis of a complex sentence construction in German Sign Language, or short DGS.  
In doing so, I explore RRG as a suitable tool for the analysis of a visual-spatial language.

I won't provide an introduction into sign languages today, because of timing reasons, but if you have any questions concerning sign languages in general, or DGS, I'd be happy to answer them.  
For now, I'd just like to point out that DGS is a visual-spatial language, signed in Germany, Belgium and Luxembourg.  
It was recognized legally as a 'proper' language in 2002 in Germany.

It's important to keep in mind, that DGS is not signed German, it differs for example in sign order, which is SOV in an unmarked DGS sentence.

So. The work I'll present today is part of my dissertation project.

# Dissertation Project

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Topic: Identification of sentence boundaries in natural, spontaneous DGS

Method:

1. Theoretical approach within RRG framework
2. Judgement task for native signers: 'Is this a sentence?'

Goal: better understanding of the DGS syntactic inventory



The reason why I am exploring whether RRG is a suitable tool for the analysis of DGS sentences is that in my dissertation, I'm trying to identify sentence boundaries in natural, spontaneous DGS signing. I am aware that the notion of 'sentence' has its difficulties, as it is missing a clear-cut definition.

I'll use it in the sense of the RRG framework as that unit, in which clauses can be combined.

The approach I take to the issue is the following:

The first step is to identify sentence boundaries in natural DGS by means of a theoretical analysis, using RRG.

The second step is to then show these segments to native signers and ask them to judge whether the boundaries are appropriate or not.

By combining theory and practice I hope to contribute to a better understanding of the syntactic inventory of DGS.

The first step in the course of this work, however, is to test whether RRG is feasible for representing DGS sentences, since visual languages exhibit some distinctive features that are rarely taken into

account by traditional linguistic theories.

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1. Example story
  2. Theoretical background
  3. Analysis of selected segment
  4. Open questions



Before we dive deeper into the subject I would like to show an example video to illustrate what I will talk about in the following.

The example is the beginning of a signed story out of which I selected one sentence to discuss with you.

Based on the story, I will briefly explain a few important issues to cover some theoretical background.

Then I'll focus on the sentence that I selected for analysis and walk you through my considerations.

However, there are quite a few open questions and as I am still learning more about RRG, I look forward to your feedback on my analysis.

# Example Video

*RETELLING OF THE PEAR STORY  
FROM THE PUBLIC DGS CORPUS*



The video you'll see is taken from the Public DGS Corpus.  
Again, I'll not go into details with my data, if you have any questions on that, I'll be happy to answer them here or in gathertown.

So, the video will not contain a written translation,  
since translations are naturally sentence-based and  
thereby already induce a bias to transfer the sentence boundaries of the translation  
to the original data.

I'll show you the video with glosses as voice over.  
Don't worry if they are not complete sentences,  
I'm pretty sure you'll be able to understand them anyways.

The story is the beginning of the Pear Story, which some of you might even be familiar with.



## Constructed action (CA)

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"Constructed action is a discourse strategy used widely within sign languages in which the signer uses his/her face, head, body, hands, and/or other non-manual cues to represent the actions, utterances, thoughts, feelings and/or attitudes of a referent[...]"

Cormier et al., 2013



What we saw is not completely spontaneous signing, but it comes pretty close.

For elicitation, the signer was told to watch the language-free movie 'the Pear Story' and retell it from memory.



He uses a technique that is common in sign languages, called constructed action.

In constructed action, a signer may take on the role of one or more characters in a story and portray their actions.

As you have just seen, the signer begins the story as the narrator, describing the setting, but then changes his perspective and takes on the role of the person picking pears.

It is this sentence, when the signer takes on the role of the person picking the pears, that I will focus on in this talk so I'll show it to you again.

It roughly translates to: 'A person climbs a ladder and while holding onto it, picks pear after pear, putting them into their apron.'



## Incorporating arguments, classifiers

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Before going into the analysis, I would like to point out a few things.

Let's start with the first two verbs, TO-CLIMB and TO-PICK.

You can see them in the first two stills.

The verbs are quite easy to identify, as both are quite iconic:

the movement mimicking either climbing or picking something.

Both TO-CLIMB and TO-PICK requires two arguments, namely someone who is climbing or picking and something that is being climbed or picked.

In both cases, there is no manual sign for the actor, instead the person climbing or picking is incorporated in the signer's body during the constructed action sequence.

Now the undergoer, what is being climbed or picked, is encoded in the specific hand shape you see in the red circle here.

Let's focus on TO-PICK: the signer uses a round hand shape, resembling the shape of a pear, instead of for example picking with pointed fingers as if he were picking cherries.

This is called a classifier or classifier handshape.

Now let's also take a look at the the third still, it shows how the pear is being put into

the apron.

TO-PUT-INTO requires three arguments:

Again, the actor is incorporated in the signers body, the undergoer, the pear, encoded in the classifier handshape.

The apron, where the pear is being put, is represented by means of the target location of the putting movement, you can see that in the yellow circle.

## Simultaneous predicates

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Here's another thing I would like to point out:

As we just saw, the signer uses multiple articulators, namely his body and the right and the left hand, which can be operated simultaneously.

And that's exactly what he does.

There is one event that occurs at the same time as the picking and putting of the pear, namely the protagonist holding onto the ladder.

If you look at the stills, you can see the picking and pocketing movement in the dominant hand, while with the non-dominant hand, the signer holds onto the ladder during both actions.

## Iterative events

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So what happens over the course of this sentence is that the picking and putting and also the holding onto the ladder, is repeated two times with alternating hands, as you can see here in the blue boxes.



## RRG analysis

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So, what do we have so far?

In the example sentence, a sequence of complex actions is depicted through two sequential verbs on the dominant hand of the signer, the picking and the putting, as well as a simultaneous third verb on the non-dominant hand: the holding onto the ladder.

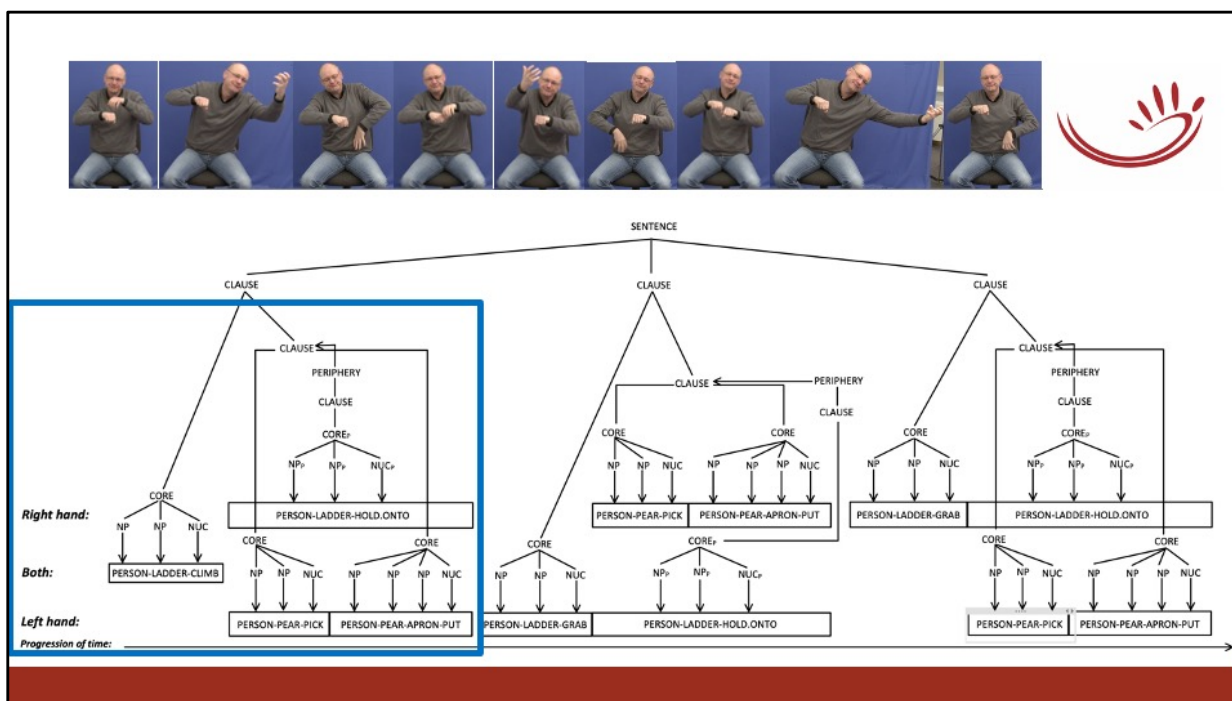
This sequence is then repeated with alternating hands two times.

All manual signs in this sentence represent one complex predicate including an actor (embodied by the signer),

an undergoer (encoded in the hand shape representing the ladder or the pear)

and in the case of the sign TO-PUT also a prepositional argument, “into the apron”, where the apron is realized as the target location of the movement. .





So, this is the analysis I propose. This tree is quite complex, so let me briefly explain how I will proceed from here:

In the following, I will start with a smaller unit and build up the tree step by step. Since the first clause is repeated two times (only with reversed hands), we will only focus on the first sequence here, Indicated by the blue box.

Before we dive in, let me point out a two things about this tree:

First of all, this syntax tree has not one, but three levels that represent the possible articulators:

The right, the left, or both hands.

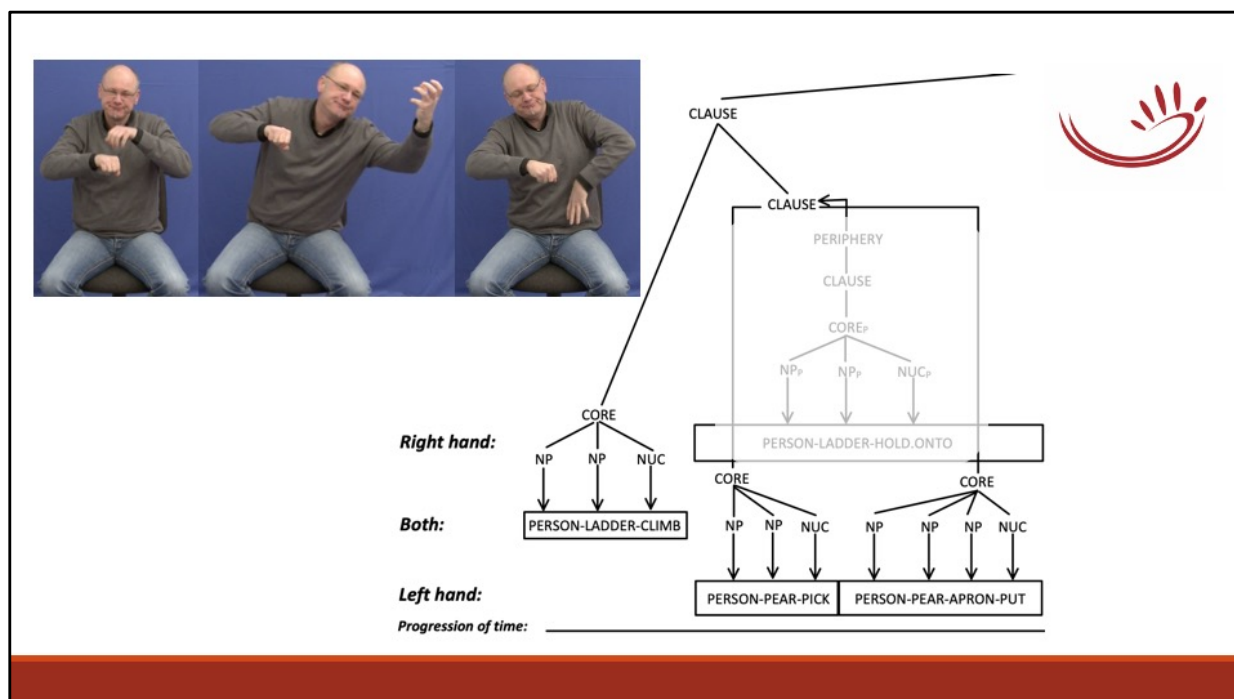
Also, I have added a timeline to help visualize the simultaneity of some signs.

This is also indicated by the length of the rectangles. Each of the rectangles represents one manual sign as well as it's length, roughly.

Secondly, the glosses I used are based on those used in the Public DGS Corpus, but I have modified them slightly in order to have the arguments included.

For example, the gloss TO-CLIMB from the Public DGS Corpus became PERSON-LADDER-CLIMB,

as both arguments, the person and the ladder, are incorporated in the signers body and the classifier handshape  
and I needed the arguments in the gloss to be able to refer to them.



Now, we just discussed the manual signs PERSON-LADDER-CLIMB, PERSON-PEAR-PICK and PERSON-PEAR-APRON-PUT:

We find the predicate in the movement, the actor in the signers body, the undergoer in the classifier handshape, and the additional argument in the case of PERSON-PEAR-APRON-PUT in the the target location of the movement.

In this way, each of theses single manual signs results in a complete core, Each with a nucleus, as well as the obligatory arguments that result from the verbs' semantics.

I analyzed these three cores as coordinated.

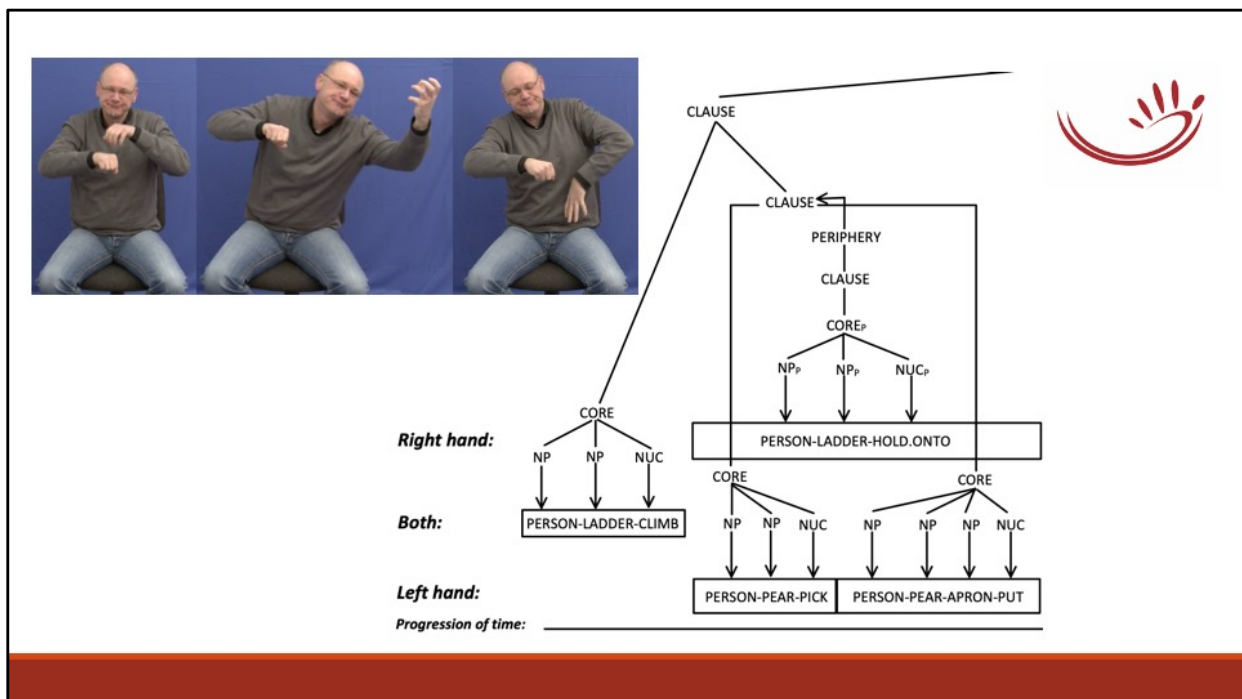
All three are signed with the dominant hand, in sequential order.

As you can see, there is no conjunction overtly expressed by means of a sign between the cores.

This is rather typical in DGS.

While manual signs for some conjunctions do exist, most of them are usually omitted and instead are being expressed non-manually, for example by means of body leans or facial expressions.

Thus, the coordination of the three sequential cores is expressed by their sequential temporal order.



Now lets look at the simultaneous signs.

I analyzed the simultaneous execution of the sign PERSON-LADDER-HOLD.ONTO as a form of peripheral subordination.

It is assigned to the clause, because it stretches over both the cores picking and putting.

This analysis is mainly motivated by the fact that the holding onto the ladder is executed with the non-dominant hand, which remains rather static while the dominant hand moves actively.

Another reason for this analysis is that the action performed by the non-dominant hand has the same subject as the picking and putting.

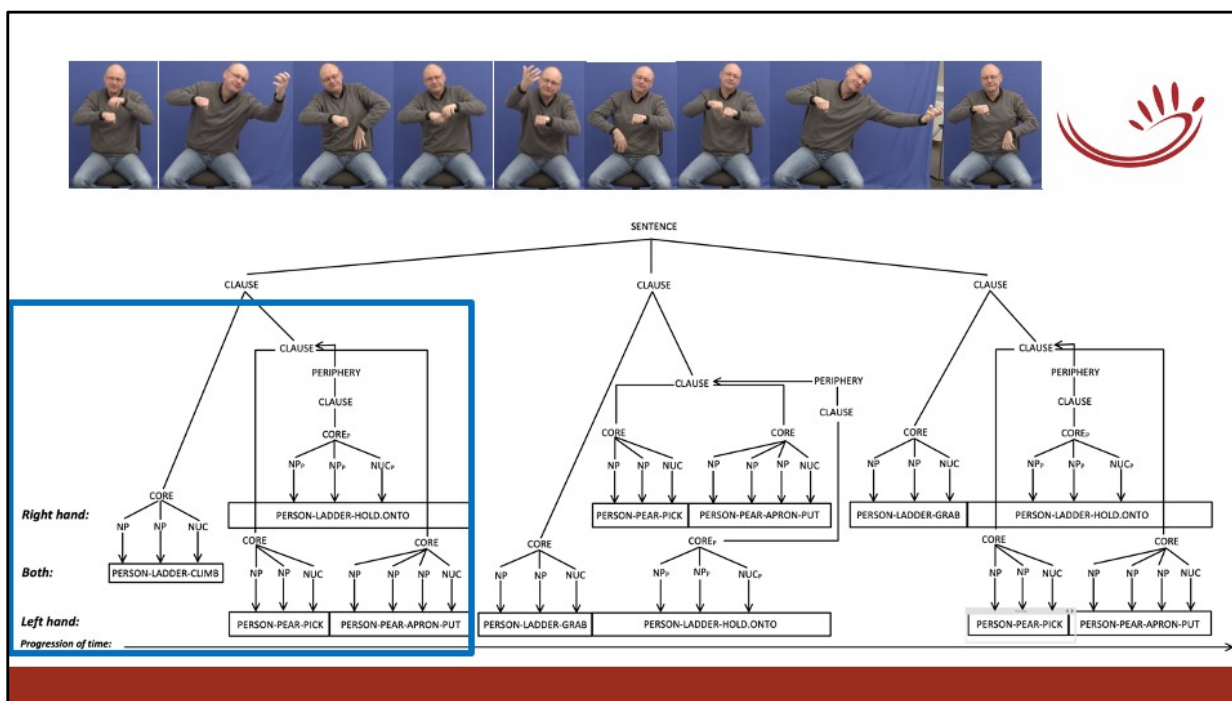
Due to the independence of articulators, in sign languages it might well be that the subjects of the simultaneous clauses differ:

While one person is holding the ladder, another person could be picking pears. In practice, however, this possibility might not be used, as it represents quite a challenge for the recipient.

As we can see, the possibility of using two articulators at the same time

obviates the need to express temporal co-extensiveness via a conjunction like ‚while‘  
in sign languages.

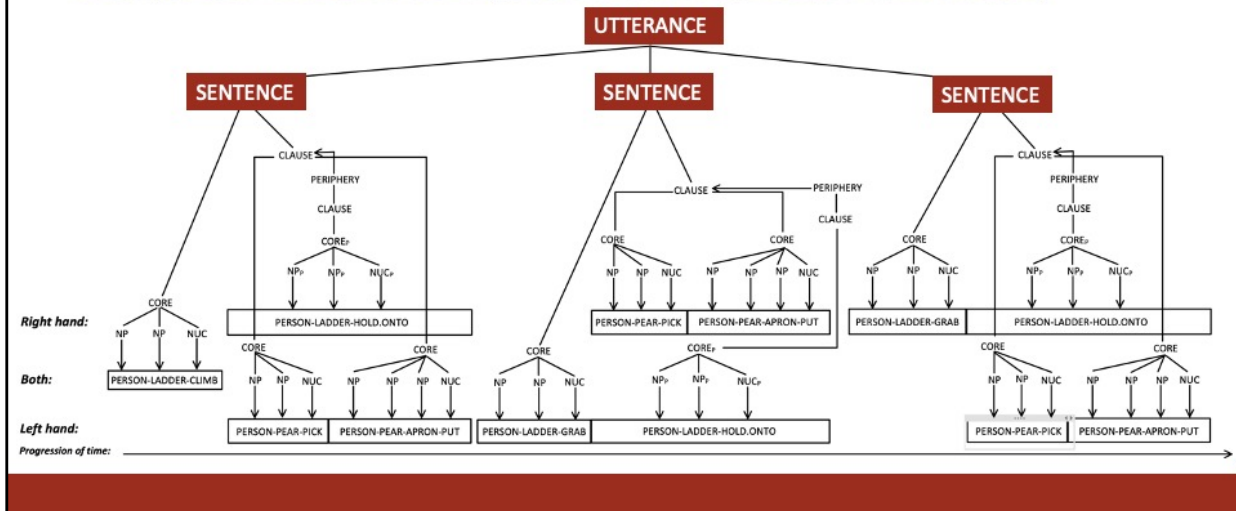
instead it is expressed by the simultaneous utterance of the two clauses.



And this is then how the whole sentence looks:  
 The clause I have just explained is in the blue box.

So, these three complex clauses are combined into a (very) complex sentence. I chose to analyze the segment as one sentence for several reasons. One is, that it forms a complete informational unit and the following sentence contains a different event: a pear falls down. Also, there is no prosodic evidence for an earlier sentence boundary. Thirdly, the tripartite structure is of such symmetry that it resembles a stylistic device. And actually, the signer's choice to actually repeat the action three times instead of using the manual sign "repeatedly" may be due to the text type or could be attributed to the signer's personal narrative style. This may well be the case, as it is quite common in sign languages to chose depicting over telling, especially in narratives.

However, one problem remains:  
 Conjunctions or clause-linkage markers are seldom expressed overtly in DGS, so it would certainly be possible to analyze the segment as this:



About this, I'm just not sure yet.

However, this is exactly what my dissertation project is about, so... we'll see where this is going.

If you have any suggestions or would be willing to discuss this with me, that would be most appreciated!



## Conclusion &

## Open questions

- ✓ RRG: suitable tool for my analysis of complex DGS sentences
- ✓ Possible to display
  - ✓ Multiple articulators
  - ✓ Simultaneous predicates

- ? CLMs, Junctions
- ? Non-manuals
- ? Operator projection
- ? Feedback



So far, I found RRG to be a suitable tool for my analysis of complex DGS sentences. The framework had to be adapted for the additional levels, but after that it was possible to display the different articulators, As well as the simultaneous articulation of predicates. However, a few questions remain.

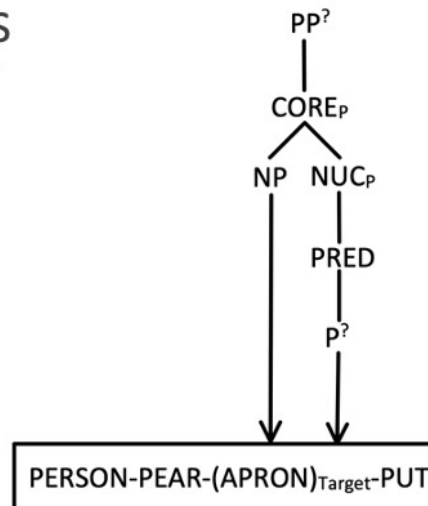
One very challenging issue is to deal with junctions, boiling down to the question I'm trying to answer in my dissertation: How do you identify sentence or clause boundaries? And how can RRG help to do that?

As I said, conjunctions are usually not expressed by means of a manual sign in DGS, but rather by non-manuals. Related to that is the question of how to display non-manuals in the syntax tree. One would certainly need another layer, probably even more, Certainly, another layer would be needed for negation, as this, too, is seldomly expressed by means of a manual sign But rather by a shaking of the head, which takes scope over the part of the sentence that is negated.

And this brings me to another point, which is the operator projection.  
So far, I've presented the constituent projection of one example sentence,  
and I haven't yet started thinking about the operator projection.  
If you have any ideas on this, I'd be very happy to chat about this!

And lastly, I would be most thankful for feedback on my analysis.  
I'm still trying to figure out how to display DGS in RRG and  
there might certainly be other options to display the syntax tree than the one I  
choose.

## More Questions



One last open question I'd like to mention regards the analysis of the arguments of TO-PUT.

Actually, the apron is signed only once, in the sentence before the one I analyzed. Afterwards, in my example sentence, no manual sign for the apron is used, Instead the apron is in the target location of the putting movement.

For the sake of clarity, I neglected this information for the moment.

I also did that that because there has in fact been some debate about whether or not there are spatial adpositions in DGS.

The reason for this is that they usually appear embedded in a movement/the goal of the movement and are not explicitly expressed as a manual sign.

This is sometimes referred to as "preposition incorporation".

Unfortunately, these considerations exceed the scope of this talk.

Many exciting and open questions remain to be answered.

# END1^



[0 1 0] [1 5] ↓ 1 X



# Literature



○ Konrad, R., Hanke, T., Langer, G., Blanck, D., Bleicken, J., Hoffmann, I., Jędrasik, O., König, L., König, S., Nishio, R., Regen, A., Salden, U., Wagner, S., Worock, S., Böse, D., Jahn, E., Schuster, M. (2020): MP DGS – annotated, Public Corpus of German Sign Language, 3rd release [Dataset]. Universität Hamburg. <https://doi.org/10.25592/dgs.corpus.3.0>

○ Chafe, W.L. (ed.) (1980): *The Pear Stories: Cognitive, Cultural and Linguistic Aspects of Narrative Production*. Norwood, New Jersey: ALEX. Stimuli movie available at <http://chafe.faculty.linguistics.ucsb.edu/pearfilm.htm> and <https://www.youtube.com/watch?v=bRNSTxTpg7U&t=35s>.

○ Pear Story Transcript in the Public DGS Corpus: [https://www.sign-lang.uni-hamburg.de/mediendg/html/1177640\\_en.html](https://www.sign-lang.uni-hamburg.de/mediendg/html/1177640_en.html), DOI: 10.25592/dgs.corpus-text-1177640

- Cormier, Kearsy, Sandra Smith, and Martine Zwets. "Framing constructed action in British Sign Language narratives." *Journal of pragmatics* 55 (2013): 119-139.
- Johnston, T., and Schembri, A. (2007): *Australian Sign Language (Auslan): An introduction to sign language linguistics*. Cambridge University Press, p.161ff.
- Meir, I., Padden, C. A., Aronoff, M., and Sandler, W. (2007): Body as subject. *Journal of Linguistics*, 43(3), 531.
- Metzger, Melanie. "Constructed dialogue and constructed action in American Sign Language." *Sociolinguistics in deaf communities* 1 (1995): 255-271.
- Van Valin, R. D. Jr., and LaPolla, R. J. (1997): *Syntax: Structure, Meaning and Function*. Cambridge: Cambridge University Press.
- Van Valin, R. D. Jr. (2001b): *An Introduction to Syntax*. Cambridge: Cambridge University Press, p.205.
- Van Valin, R. D. Jr. (2010): Role and Reference Grammar as a framework for linguistic analysis. *The Oxford handbook of linguistic analysis*.
- Winston, Elizabeth. "Space and involvement in an American Sign Language lecture." *Expanding horizons: Proceedings of the Twelfth National Convention of the Registry of Interpreters for the Deaf*. RID Publications Silver Spring, MD, 1992.

