

Assignment 4: Grammar fragment

Arno Moonens

Studentnr.: 500513

arno.moonens@vub.ac.be

Abstract

The grammar fragment I implemented was the usage of the reflexive pronoun in sentences written in the present tense and in the present perfect tense. For both type of sentences, 1 construction was used. There is also one construction for each subject, verb and reflexive pronoun type. The requirement here is that the reflexive pronoun refers to the subject of the sentence. In the examples, it can be seen that this is indeed the case when comprehending. It was also seen that it is possible to use the same constructions to produce an utterance of a sentence with a reflexive pronoun using a set of meanings.

1. Introduction

In this assignment, I implemented the use of the reflexive pronoun in the Dutch language, both in the present and present perfect tense. We will first further explain these grammar fragment, after which we will see how the comprehension and production of these constructions are implemented using the Fluid Construction Grammar. We end by looking at some examples of the comprehension and production of this grammar fragment.

2. Explanation of the grammar fragment

With the grammar fragment that was implemented, two types of sentences written in Dutch can be comprehended and produced. The first one is the sentence in the present tense containing a reflexive pronoun. An example of this is “ik was me”, which translates to “I wash myself”. These kind of phrases consist of a subject, a verb and a reflexive pronoun. This pronoun refers to the subject of the clause itself. In the example “me” refers to “ik”.

The second type of sentence is one written in the present perfect tense, also containing a reflexive pronoun. An example of this is “ik heb me gewassen”, which translates to “I have washed myself”. This type of sentences contains a subject, a auxiliary verb, a reflexive pronoun and a regular verb. The reflexive pronoun again refers to the subject of the sentence. Note that here, in contrary to the first type of sentences, the regular verb is placed after the reflexive pronoun.

3. Implementation

We first have a number of subjects. These have each a referent which is the subject itself, a set of syntactical features, a meaning and a form.

The first syntactical feature is the lexical category. This is simply a pronoun for all subject constructions. The person is the grammatical person of this subject, which can be **first**, **second** or **third**. With number, we mean the plurality of the subject, which can be **singular** or **plural**.

We always use only one meaning to refer to the construction. This is most of the time just the translation in English. For “you”, we have constructions to denote the singular and the plural form. Thus, we needed 2 different meanings. These are for the singular and plural form respectively **you-singular** and **you-plural**.

We also need conjugations of different verbs. These are all for the verbs “wassen” and “hebben”. Every verb construction that is a conjugation of the verb “wassen” has 3 arguments: for the event, for the washer(s)

and for the person(s) being washed. For the conjugation of the verb “hebben”, there is only 1 argument, namely for the event. Each verb construction also has semantic and syntactic features, multiple meanings and a form.

The semantic class of a verb is always an event, and the semantic valence both contains the actor and the undergoer of the event.

The lexical category of these constructions is always a verb. The verb type depends on how the verb is used. For the verb “hebben”, the type is **auxiliary** because it is used as an auxiliary in the present perfect tense. The verb type of the conjugations of the verb “wassen” is always **regular**. The tense says if the verb is conjugated in the present tense (like “was” in “ik was me”) or the past tense (like “gewassen” in “ik heb me gewassen”). Just like with the subject, there is also a person and plurality to apply the right conjugation. The values of these, however, are not always atomic symbols, but can be variables. This is for example the case with “wassen”, where the plurality is **plural** but the grammatical person doesn’t matter, because it is the same for all of them.

For all conjugations of verbs, the meaning contains the infinite form of the verb. For verbs in the present tense, the conjugation form (person and number) is also added. For the verb “wassen”, we also have meanings to denote the person(s) that wash and the person(s) being washed.

Each reflexive pronoun conjugation has a referent for the person(s) that’s being referred to, a syntactical category, a meaning and a form.

Here, the lexical category is always **reflexivepn** to denote a reflexive pronoun. We also each time have a person and number that denotes respectively the grammatical person and the plurality of the object that the reflexive pronoun refers to. These also don’t always have atomic symbols as values initially.

There is only one meaning for each reflexive pronoun construction, which says that it is a reflexive pronoun and also has a name which signals which person-plurality combination(s) can be pointed at with this reflexive pronoun. For “zich”, for example, we have the meaning **reflexive-other-s**. This is meant for referring to something in 3rd person singular or plural.

For comprehending and producing, we have one construction for phrases in the present tense with a reflexive pronoun and one construction for phrases in the present perfect tense with a reflexive pronoun.

In both constructions, we have a **person-agreement** and **number-agreement**. The values of these must match with the **person** and **number** of the subject, the reflexive pronoun and the verb that is conjugated in the present tense. This is done by using the same variables in the contribution lock of the phrase construction as in the production lock in the constituents.

The difference between the 2 phrase constructions is the constituents and the order. For the phrase in the present tense, we only have 3 constituents: a subject, a reflexive pronoun and a verb. Using multiple **meets**, the same order as how it was listed here is enforced. The mentioned verb must be conjugated in the present tense and must be a regular verb. For the phrase construction in the present perfect, we have 4 constituents: a subject, an auxiliary verb, a reflexive pronoun and a verb in the past tense. These are also in the same order as was listed, which was also enforced using multiple **meets**. The auxiliary verb must be conjugated in the present tense and must have the verb type **auxiliary**. The other verb must have the verb-type **regular** and must be conjugated in the past tense.

The lexical category was put in the comprehension lock of each constituent of the phrases to enforce that the lexical category of the unit we handle is the same as the one we need.

After comprehension, we can unify variables in meanings to say that the subject is the same as the person(s) being referred to using the reflexive pronoun. In production, the production lock can only be “unlocked” if the person(s) of the subject can be unified with the person(s) being referred to using the reflexive pronoun.

4. Examples

Our first example is the comprehension of “zij wassen zich”. Because we have constructions with the same forms in the comprehension locks, we obtain the constructions shown in Figure 1.

Now, the construction for the phrase in the present tense with a reflexive pronoun can be applied. This is possible because we have 3 constructions with the right lexical categories, in the same order, with a verb in the present tense and with number and person that can be unified. The resulting construction and meaning can be seen in Figure 2.

zij-1 meaning: {them(?x-37)} form: {string(zij-1, "zij")} referent: ?x-37 syn-cat: lex-cat: pronoun person: third number: plural	wassen-1 meaning: {wassen(?x-36), wassers(?x-36, ?wassers-2), gewaste(?x-36, ?gewaste-11)} form: {string(wassen-1, "wassen")} sem-cat: sem-class: {event} sem-valence: actor: ?wassers-2 undergoer: ?gewaste-11 args: [?x-36, ?wassers-2, ?gewaste-11] syn-cat: lex-cat: verb verb-type: regular tense: present number: plural person: ?person-6
	zich-1 meaning: {reflexive-other-s(?x-33)} form: {string(zich-1, "zich")} referent: ?x-33 syn-cat: lex-cat: reflexivepn person: third number: ?number-5

Figure 1. Contructions obtained after applying comprehension locks to individual words.

We can see that all variables that had to be unified have been successfully unified. This can for example be seen in the value for number in the **zich-2** construction, which is now **plural** instead of the variable **?number-15**.

In the meanings, we can now see that the persons being referred to are the same because each time the same variable **?gewaste-27** is used.

We now look at the comprehension of the same phrase, but in the present perfect tense, “zij hebben zich gewassen”. Because “zij” and “zich” will result in the same construction as was already shown in Figure 1, we only show the constructions of the verbs. These can be seen in Figure

We have have 4 constructions in total. These can be used by the construction for the phrase in the present perfect tense with a reflexive pronoun. The resulting construction and the meaning are shown in Figure 4.

We again see that all the unifications succeeded. The difference between this meaning and the one of the phrase in the present tense is the “hebben” and “plural”, by which we can see that we use an auxiliary and have a present perfect phrase.

We now produce the utterance “ik was me” using a set of meanings. We start by using the set '((me p) (verb event) (wasser event p) (gewaste event p) (wassen event) (reflexive-me p) (first-person event))'. A visualization of this can be seen in Figure 5.

The meaning (me p) is used to denote the subject, where p is the person doing the event. (reflexive-me p) is used to denote the reflexive pronoun and the other meanings are used to produce the right verb. By trying to apply the available constructions on the meanings in the root, we first get the constructions that can be seen in Figure 6.

Here we see that the arguments in **args** are already bound because they unify with what the argument that was given in the meaning(s). Note that the **person** and **number** of all constructions are already bound here because these specific constructions found using their meaning(s) can only be applied on 1 person-plurality combination.

After this, the construction for the phrase in the present tense with the reflexive pronoun can be applied. This construction is shown in Figure 7.

Because we already enforced using the meanings that the person that does the action and the undergoer is the same person and that the lexical categories and conjugation are right, it is easy to see that this construction is applicable. Because of the **meets** in this construction, we eventually get the words in the right order. Thus, the resulting sentence is “ik was me”.

We will now produce the same phrase, but in the present perfect tense. The meanings for this is '((hebben event) (first-person event) (singular event) (me p) (reflexive-me p) (gewassen event) (wasser event p) (gewaste event p))'. The difference here is that we here use the past tense of the word “wassen” and we also have the word “hebben”, along with another meaning (**singular event**). This

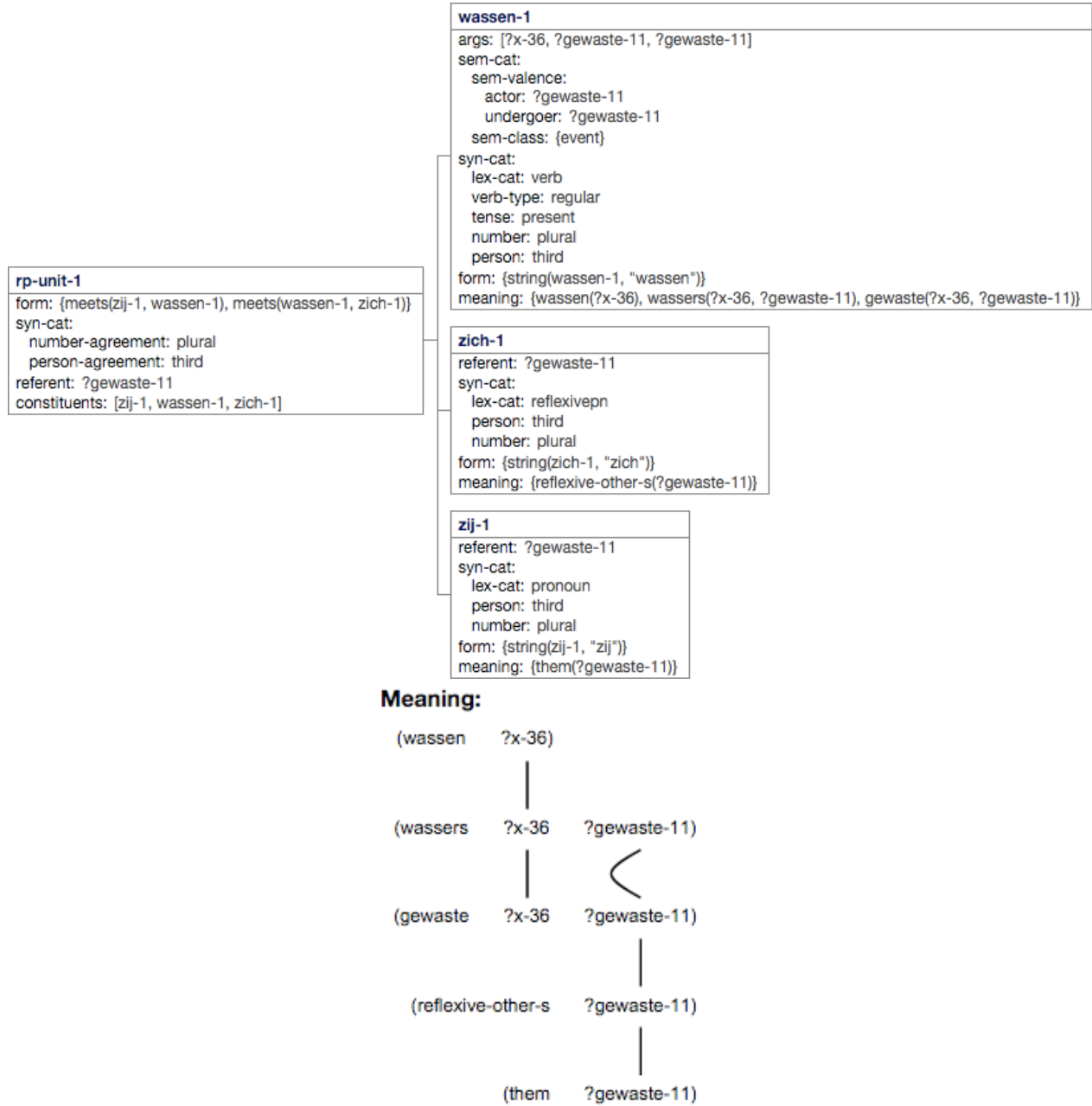


Figure 2. Resulting construction and meaning after comprehension.

is necessary because we otherwise have no information about the plurality of the conjugation of the word “hebben”. A visualization of the meanings can be seen in Figure 8.

The obtained constructions from applying construction on the meanings in the root are the same as in the previous example for the subject and the reflexive pronoun. The obtained constructions for the verbs can be seen in Figure 9.

We again see that all variables have already been bound. Because we here both have a regular verb in the past tense and an auxiliary verb, along with the right subject and reflexive pronoun constructions, we can apply the **pprp-cxn**. This is shown in Figure 10. Note that the **rp-cxn** can’t be applied here because the regular verb (“gewassen”) isn’t conjugated in the present tense and doesn’t even have person and number. Because this construction also contains **meets**, we get a sentence with words in the right order, which is “ik

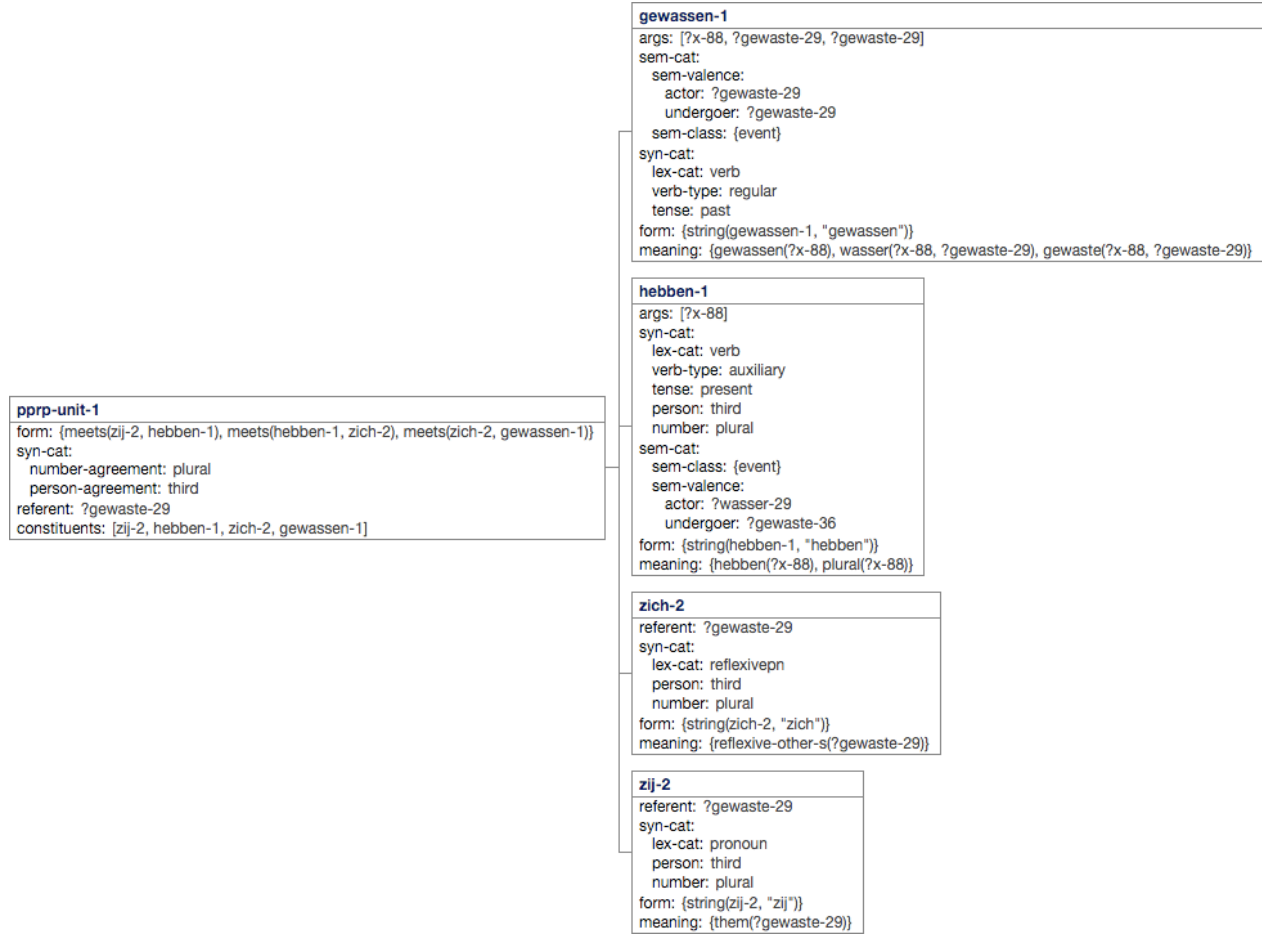
hebben-1 meaning: {hebben(?x-106), plural(?x-106)} form: {string(hebben-1, "hebben")} sem-cat: sem-class: {event} sem-valence: actor: ?wasser-29 undergoer: ?gewaste-36 args: [?x-106] syn-cat: lex-cat: verb verb-type: auxiliary tense: present person: ?person-25 number: plural	gewassen-1 meaning: {gewassen(?x-88), wasser(?x-88, ?wasser-23), gewaste(?x-88, ?gewaste-29)} form: {string(gewassen-1, "gewassen")} sem-cat: sem-class: {event} sem-valence: actor: ?wasser-23 undergoer: ?gewaste-29 args: [?x-88, ?wasser-23, ?gewaste-29] syn-cat: lex-cat: verb verb-type: regular tense: past
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Figure 3. Constructions for the words "hebben" and "gewassen"

heb me gewassen".

5. Conclusion

We first discussed which constructions I used to comprehend and produce utterances of sentences written in the present or present perfect tense with a reflexive pronoun. Each different word for the subjects, verbs and reflexive pronouns have their own construction. There is also 1 construction for the sentence in the present tense and one for the sentence in the present perfect tense. As was confirmed by the examples, the subject and the referent of the reflexive pronoun can be unified and the same constructions can be used for both comprehension and production.



Meaning:

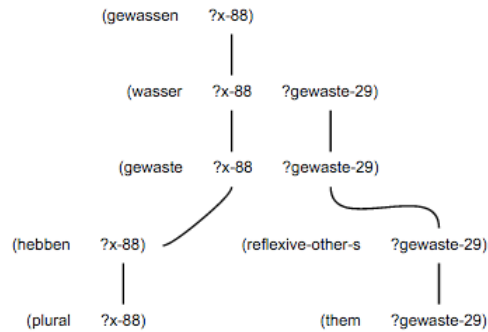


Figure 4. Resulting construction and meaning after comprehension.

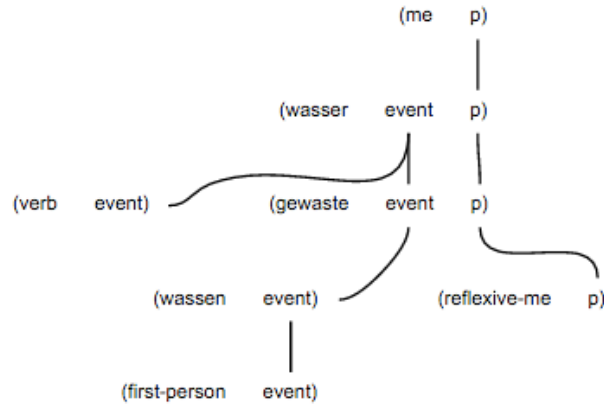


Figure 5. Visualization of the meanings used to produce "ik was me".

ik-word-1 form: {string(ik-word-1, "ik")} meaning: {me(p)} referent: p syn-cat: lex-cat: pronoun person: first number: singular	was-unit-1 form: {string(was-unit-1, "was")} meaning: {wassen(event), wasser(event, p), gewaste(event, p), first-person(event)} sem-cat: sem-class: {event} sem-valence: actor: p undergoer: p args: [event, p, p] syn-cat: lex-cat: verb verb-type: regular tense: present person: first number: singular
	me-word-1 form: {string(me-word-1, "me")} meaning: {reflexive-me(p)} referent: p syn-cat: lex-cat: reflexivepn person: first number: singular

Figure 6. First constructions obtained after trying constructions on the meanings in the root.



Figure 7. Construction formed by applying the **rp-cxn**.

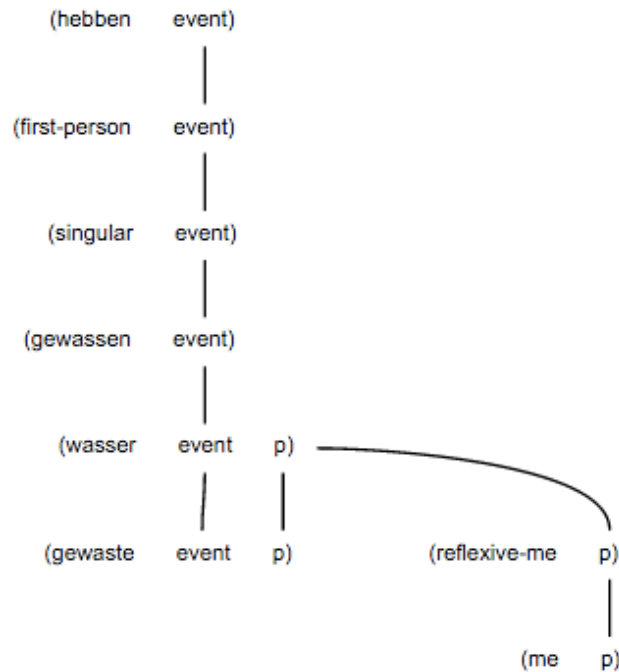


Figure 8. Visualization of the meanings used to produce "ik heb me gewassen".

heb-unit-1
form: {string(heb-unit-1, "heb")} meaning: {hebben(event), first-person(event), singular(event)} sem-cat: sem-class: {event} sem-valence: actor: ?wasser-37 undergoer: ?gewaste-44 args: [event] syn-cat: lex-cat: verb verb-type: auxiliary tense: present person: first number: singular
gewassen-unit-1
form: {string(gewassen-unit-1, "gewassen")} meaning: {gewassen(event), wasser(event, p), gewaste(event, p)} sem-cat: sem-class: {event} sem-valence: actor: p undergoer: p args: [event, p, p] syn-cat: lex-cat: verb verb-type: regular tense: past

Figure 9. Obtained constructions for the verbs.

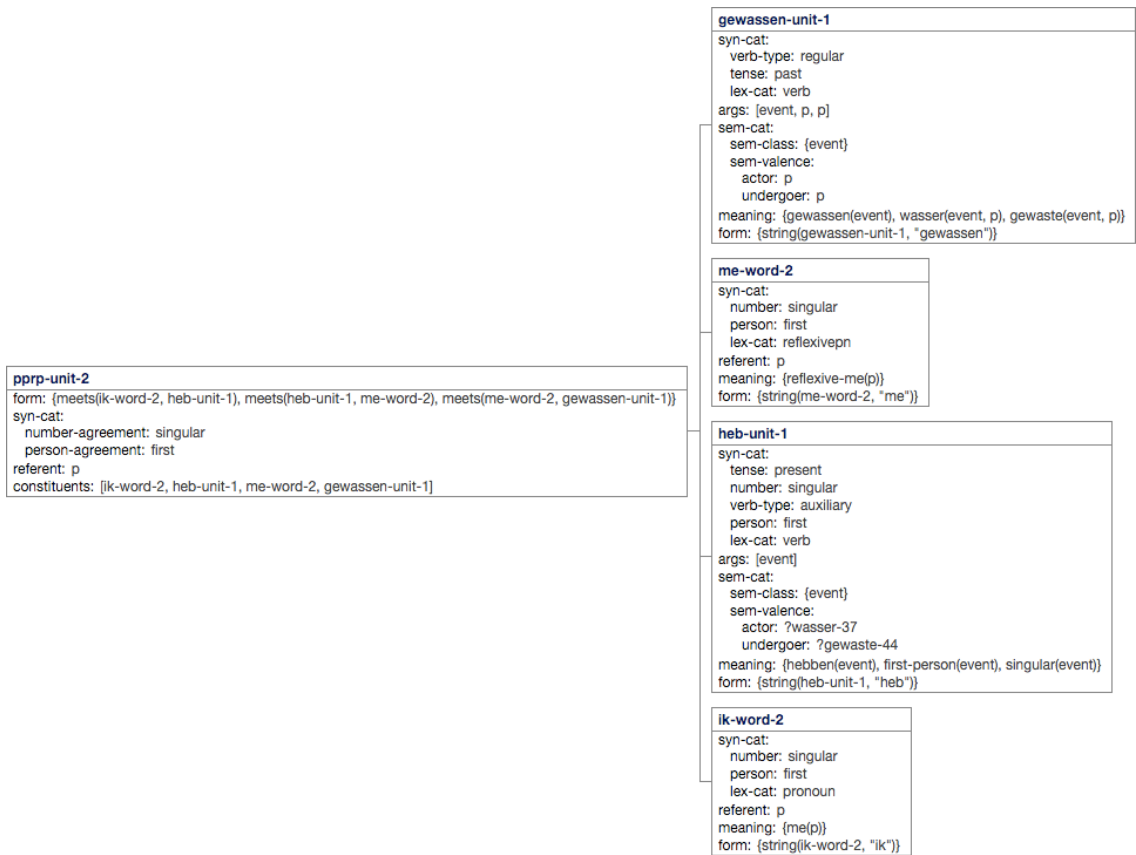


Figure 10. Obtained construction for the phrase in the present perfect tense with a reflexive pronoun.