

On *noch (ein)mal so*

Mira GRUBIC — Universität Potsdam

Abstract. This paper discusses the expression *nochmal so* (occurring with a gradable adjective) which is translated either as *twice as* or as *that ..., too*. It is argued that *nochmal* in these sentences is a contraction of *noch einmal* (lit. *still/in addition once*), whereby *noch* (= ‘still’, *in addition*) is a phasal particle which can be used with a variety of different readings, e.g. a temporal reading as *still* and additive reading as *in addition*. A particular puzzle of the examples discussed in this paper is that, in contrast to the predictions of the standard account of *noch* which assumes that it merely contributes a presupposition, the presence of *noch* matters for the truth conditions of the sentence. In order to account for this, I will adopt and adapt Thomas (2018)’s differential account of additive *noch* and argue that the *noch* in *nochmal so* is additive.

Keywords: phasal adverbials, aspectual particles, additive particles, degrees

1. Introduction

In this paper, I discuss the use of *noch(ein)mal* in examples like (1)–(2), where it is part of an AP containing a gradable adjective.

- (1) (When we bought our turtle, it weighed 16 grams)
Jetzt ist sie **nochmal so** schwer.
now is she still.once so heavy
‘Now it is twice (lit. still once) as heavy.’
- (2) (From a description of harvest mice:)
Ihre Kopf-Rumpf-Länge beträgt durchschnittlich 6 cm, der Schwanz ist **nochmal**
their head-body.length amounts.to mean 6 cm the tail is still.once
so lang.
so long
‘Their mean head-body length is 6cm, the tail is that long, too.’

It will be proposed that *nochmal* is underlyingly a combination of the additive particle *noch* (‘still’, *in addition*) and a factor phrase *einmal* (‘once’) in examples like (1)–(2). In the following sections, first the standard account of *noch* is introduced (§2), then it will be discussed why it cannot account for examples like (1) (§3). Section 4 introduces Thomas’ 2018 account for additive *noch*. Section 5 shows how this approach can account for these examples.

2. Noch / still: standard analysis

In (3), a variant of Beck (2020)’s proposal for the core meaning of *noch/still* is shown (see also e.g. König 1977; Löbner 1989; Ippolito 2007; Beck 2016 for similar proposals).

- (3) $[[noch/still]]^{S,x*} = \lambda x. \lambda P \in D_{\langle x,t \rangle}: x* \prec_S x \ \& \ P(x*). \ P(x)$
 ‘true if entity x has property P ; triggers the presupposition that a salient entity x^* is ranked lower on a salient scale S and also has property P ’

Noch takes some entity x and a property P of such entities as arguments and contributes the presupposition that there is a salient other entity x^* ranked lower on a salient scale which also has property P . Importantly, *noch* is assumed to contribute no at-issue / asserted meaning.

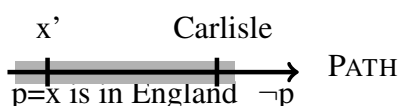
Depending on the kind of scale (and correspondingly, the semantic types of the relevant entity and property), different readings arise. The main reading of *noch/still* is usually assumed to be the temporal reading shown in (4). In this case, the scale is temporal, and the entities ranked on the scale are thus time intervals. *Noch* in (4) does not contribute to the truth conditions, but contributes a presupposition that there was a previous time at which the proposition (the second argument of *noch*) was true, and possibly an implicature that it will be false in the future.

- (4) TEMPORAL reading (‘imperfective’)
 Paul ist noch krank.
 Paul is still sick
 ‘Paul is still sick.’
 (i) Assertion: Paul is sick
 (ii) Presupposition: Paul was previously sick
 (iii) Implicature: Paul will be healthy in the future



In both German and English, the scale involved in the meaning of *noch* / ‘still’ can also be locative (5) instead of temporal, and degree-related (6). The latter two readings are discussed under the heading of marginality, since the implicature (entities higher on the scale do not have the property anymore) seems to be more relevant to these readings whereas the presupposition (entities lower on the scale have the property too) is almost trivial.

- (5) MARGINALITY reading (locative):
 Carlisle liegt noch in England.
 Carlisle lies NOCH in England
 ‘Carlisle is still in England.’
 (i) Assertion: Carlisle is in England
 (ii) Presupp.: closer locations on the path are in England
 (iii) Implicature: locations further away are not in England



(6) MARGINALITY reading (degree):

Paul ist noch moderat, Peter ist schon radikal.

Paul is NOCH moderate Peter is already radical

‘Paul is still moderate, Peter is already radical.’

Paul ist noch moderat ...

(i) Assertion: Paul is moderate

(ii) Presupposition: Individuals lower on the scale are moderate

(iii) Implicature: Individuals higher on the scale are not moderate

(Löbner, 1989; König, 1991; Ippolito, 2007)

A reading of *noch* that will be very relevant for the discussion here is the *additive* reading, which is not shared by *still* in English. Examples for this reading are shown in (7)–(8). In (7), *noch* behaves very similar to an additive focus-sensitive particle like *also* or *too*: it associates with the focused constituent *ein Kind* (= ‘a child’), and contributes a presupposition entailing that somebody else sang. This can be incorporated into the standard account of *noch* by assuming that the scale is the time of utterance, and that the entities ordered on a scale are utterances (e.g., answers to the same QUD, for discussion see Eckardt, 2007; Umbach, 2012; Grubic and Wierzba, 2021).

(7) ADDITIVE reading (unstressed *noch*):

Dann sang noch EIN KIND.

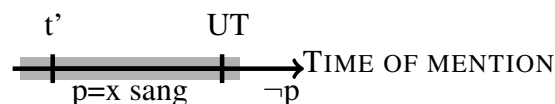
then sang still a child

‘A CHILD sang in addition.’

(i) Assertion: A child sang

(ii) Presupp.: Preceding utterances entail that someone sang

(iii) Implicature: Future utterances will not entail that somebody sang — i.e., nobody else sang



A further kind of additive reading involves stress on *noch* itself, see (8). These examples are often assumed to involve indefinite DPs (but see the discussion later in this paper, where this assumption will be called into question). They are not translatable with additive particles like *also/too* but instead are often paraphrased using *another* or *more*. The two kinds of additive readings (with stressed vs. unstressed *noch*) are usually assumed to underlyingly involve the same kinds of scales, but a different focus pattern (Umbach, 2012).

(8) ADDITIVE reading (stressed NOCH, Umbach 2012):

Dann sang NOCH ein Kind.

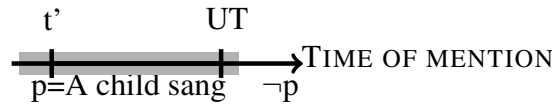
then sang still a child

‘Then, another child sang.’

(i) Assertion: A child sang

(ii) Presupp.: Preceding utterances entail that **a child sang**

(iii) Implicature: Future utterances will not entail that somebody sang — i.e., nobody else sang



To sum up, the standard account of *noch* (and *still*) is that it contributes a kind of additive presupposition about another entity ranked lower on a salient scale. Different readings of *noch* arise depending on the different kinds of scales (and entities ranked on them) admissible for the particle — this may differ from language to language. Under the standard account, *noch* does not contribute to the truth conditions of the utterance. The following section discusses whether this latter assumption is feasible for *nochmal so* as well.

3. *Nochmal so*: What is the issue?

There are two kinds of *noch(ein)mal so*-examples: (i) one where it gets a reading as ‘twice as’, see example (1), (ii) and one where it gets a reading as ‘also like that’ (2) (both repeated below).

- (1) (When we bought our turtle, it weighed 16 grams)
 Jetzt ist sie **nochmal so schwer**.
 now is she still.once so heavy
 ‘Now it is twice (lit. still once) as heavy.’
- (2) (From a description of harvest mice:)
 Ihre Kopf-Rumpf-Länge beträgt durchschnittlich 6 cm, der Schwanz ist **nochmal**
 their head-body.length amounts.to mean 6 cm the tail is still.once
so lang.
 so long
 ‘Their mean head-body length is 6cm, the tail is that long, too.’

I will first briefly discuss what these sentences mean without *noch* in sections 3.1–3.2, then return to discuss these examples in section 3.3.

3.1. Gradable adjectives and *so*

The adjectives involved are gradable. Gradable adjectives denote relations between degrees and individuals, see (9a), which will be abbreviated as in (9b) in the following examples.

- (9) a. $[[\text{tall}]] = \lambda d \in D_d. \lambda x \in D_e. \text{height}(x) \geq d$
 b. $[[\text{tall}]] = \lambda d \in D_d. \lambda x \in D_e. x \text{ is } d\text{-tall}$

Overt degrees such as *1.79m* are possible first arguments for adjectives like *tall* (10).

- (10) $[[1.79\text{m tall}]] = \lambda x \in D_e. x \text{ is } 1.79\text{m-tall}$

Note that anyone who is 1.79m tall is also tall to every lower degree, see (11). In addition, (10) is compatible with actually being taller than 1.79m — it is merely an implicature of, e.g. Ali is 1.79m tall that he isn’t taller than that.

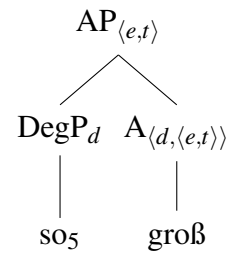
- (11) height(ali) $\geq$ 1.79m
 $\rightarrow$ height(ali) $\geq$ 1.78m
 $\rightarrow$ height(ali) $\geq$ 1.77m
 ...

The *so* occurring in examples (1) and (2) seems to be anaphoric (see e.g. Umbach and Ebert 2009 for other uses). This means that *so* refers to a recently mentioned (or otherwise salient) degree, see (12) for an example for anaphoric *so*.

- (12) (after talking about or while pointing at someone:)
 Ali ist auch *so* groß.
 Ali is also *so/such* tall
 ‘Ali is that tall, too.’

It will be assumed here that *so* can be represented as a degree pronoun (Beck, 2012; Hohaus and Zimmermann, 2021) and that its reference is resolved via an assignment function, as in (13).

- (13) a. $[[\text{groß}]] = \lambda d \in D_d. \lambda x \in D_e. x \text{ is } d\text{-tall}$
 b. $[[\text{so}_5]]^g = g(5) = 1.79\text{m}$
 c. $[[\text{so}_5 \text{ groß}]]^g = \lambda x \in D_e. x \text{ is } 1.79\text{m-tall}$



Thus, the meaning of (14) (a variant of (2) above) can be represented as in (15), where *so* refers to the prementioned length ‘6cm’.

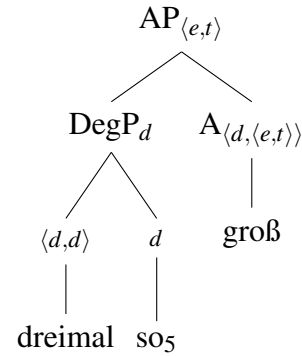
- (14) (Their mean head-body length is 6cm)
 der Schwanz ist **auch so lang**.
 the tail is also so long
 ‘The tail is that long, too.’
- (15) $[[\text{der Schwanz ist auch so}_2 \text{ lang}]]^g = 1$ iff the-tail is 6cm-long,
 defined iff something else is 6cm long.

What is missing in order to analyze examples like (1) and (2) is the question of how to interpret *nochmal* (sometimes written ‘noch mal’). It will be suggested here that this can be decomposed into *noch* (= ‘still’) and *(ein)mal* (= ‘once/1-times’). The standard account of *noch* is discussed above in section 2, but *(ein)mal* remains to be discussed.

3.2. Adjectival factor phrases: *einmal*

Gobeski (2019: §4.4) discusses factor phrases in equatives (e.g. *Ali is three times as tall as Bea*). He assumes that the equative DegP denotes a degree (see also Gobeski and Morzycki, 2017). Since anaphoric *so* is assumed to denote a degree as well, I show this with *so* in (16)–(17). The meaning of *dreimal* (= ‘three times’) is shown in (17a), it is of type $\langle d, d \rangle$, taking a degree as an argument and returning a degree.

- (16) (Bea is 80cm tall.)
 Ali ist dreimal so₅ groß.
 Ali is three.times so tall
 ‘Ali is three times that size.’
- (17) a. $[[\text{dreimal}]] = \lambda d. 3 \times d$
 b. $[[\text{dreimal so}_5]]^g = 3 \times g(5) = 3 \times 80\text{cm}$
 c. $[[\text{dreimal so}_5 \text{ groß}]]^g$
 $= \lambda x. x \text{ is } 3 \times 80\text{cm-tall}$
 d. $[[\text{Ali ist dreimal so}_5 \text{ groß}]]^g$
 $= 1 \text{ iff Ali is } 3 \times 1.70\text{m-tall}$



For this reason, the DegP can remain in-situ and doesn't have to raise for reasons of type.

3.3. *Nochmal so* examples – standard account

According to the standard account of *noch*, it does not contribute to the assertion. This means that, putting the puzzle pieces seen so far together, the assertion of (1) is (18).

- (1) (When we bought our turtle, it weighed 16 grams)
 Jetzt ist sie **noch (ein)mal so schwer**.
 now is she still.once so heavy
 ‘Now it is twice (lit. still once) as heavy.’
- (18) $[[\text{sie ist einmal so schwer}]] = 1 \text{ iff the turtle is } 1 \times 16\text{gram-heavy}$

The presupposition assumed for these examples would depend on the underlying scale assumed. For example, for (1), one of the following may be a potential presupposition.

- (19) Presupposition (TEMPORAL):
 The turtle was $1 \times 16\text{gram-heavy}$ **at a preceding time**
- (20) Presupposition (ADDITIVE):
 There is **a preceding utterance** of the form: the turtle is $1 \times 16\text{gram-heavy}$
- (21) Presupposition (DEGREE):
 There is **a lower degree n** such that the turtle is n gram-heavy

All of (19)–(21) seem correct to some extent for (1) (recall that being 16gram-heavy entails being heavy to a lower degree!). However, the problem with the turtle example is that the assertion in (18) does not seem correct. The account needs to capture that the **difference** between the former weight and the current weight is $1 \times 16\text{gram}$. I will turn to such an account in §4.

To see that this differential meaning component is asserted, consider the following examples. If the sentence is negated (22), turned into a Y/N question (23), or embedded in the antecedent of a conditional (24), it does not follow anymore that the turtle is twice as heavy, i.e. this meaning component is not a presupposition or conventional implicature.

- (22) (When we bought our turtle, it weighed 16 grams)
 Es ist nicht der Fall dass sie jetzt **noch (ein)mal so schwer** ist.
 it is not the case that she now still.once so heavy is
 ‘It is not the case that it is twice (lit. still once) as heavy now.’
- (23) (When we bought our turtle, it weighed 16 grams)
 Ist sie jetzt **noch (ein)mal so schwer**?
 is she now still.once so heavy
 ‘Is it twice (lit. still once) as heavy now?’
- (24) (When we bought our turtle, it weighed 16 grams)
 Wenn sie jetzt **noch (ein)mal so schwer** ist...
 if she now still.once so heavy is
 ‘If it is twice (lit. still once) as heavy now...’

It isn’t a conversational implicature, either: it cannot be cancelled to assert a that the turtle is heavy to a lower degree, see (25).¹

- (25) (When we bought our turtle, it weighed 16 grams)
 Jetzt ist sie **noch (ein)mal so schwer**, #ja sie wiegt inzwischen 25 Gramm.
 now is she still.once so heavy indeed she weighs up.to.now 25 grams
 ‘Now it is twice (lit. still once) as heavy, #in fact it weighs 25 grams now.’

An attempt at reinforcing the sentence by conjoining the meaning component leads to redundancy (26).

- (26) (When we bought our turtle, it weighed 16 grams)
 Jetzt ist sie **noch (ein)mal so schwer**, #ja sie wiegt inzwischen doppelt so
 now is she still.once so heavy indeed she weighs up.to.now double so
 viel.
 much
 ‘Now it is twice (lit. still once) as heavy, #in fact it weighs twice as much now.’

The tests in (25)-(26) show that this meaning component is not a conversational implicature either. A final test is shown in (27). Not-at-issue meaning components such as presuppositions and implicatures cannot be challenged by using a simple negation. That B’s negative reply in (27) can target this meaning component is thus further evidence that it is asserted.

- (27) (When we bought our turtle, it weighed 16 grams)
 A: Jetzt ist sie **noch (ein)mal so schwer**.
 now is she still.once so heavy
 ‘Now it is twice (lit. still once) as heavy.’
 B: Nein!
 no
 (Negates that the turtle is twice as heavy)

Example (2) does not face the same challenges. Its expected assertion, according to the standard account, is (28), and this seems correct (it is in fact almost the same as the one for (14) above).

¹That the turtle isn’t heavier is in fact an implicature which is standard in the case of overt degrees, see section 3.1 for discussion.

- (2) Ihre Kopf-Rumpf-Länge beträgt durchschnittlich 6 cm, der Schwanz ist **nochmal**
 their head-body.length amounts.to mean 6 cm the tail is still.once
so lang.

so long

‘Their mean head-body length is 6cm, the tail is that long, too.’

- (28) [[der Schwanz ist einmal so lang]] = 1 iff the tail is $1 \times 6\text{cm}$ long

Of the potential presuppositions, only an additive presupposition seems suitable. However, it would require unstressed *noch* and a focus accent on *der Schwanz* (= ‘the tail’).²

- (29) Presupposition (TEMPORAL):

The tail was $1 \times 6\text{cm}$ -long **at a preceding time**

- (30) Presupposition (ADDITIVE):

There is **a preceding utterance** of the form: x is $1 \times 6\text{cm}$ -long

- (31) Presupposition (DEGREE):

There is **a lower degree n** such that the the tail is n cm-long

The following section presents an alternative view of particles like *noch*, which helps to shed a light on examples like (1). An analysis of both examples will be presented in section 5.

4. Additive *noch*: Thomas 2018

The account of Thomas (2018) differs from the standard account in that particles like *noch* make a contribution to the truth conditions of the sentence. Thomas stresses that *noch* has a comparative component: it always involves an element ranked higher on a scale than another one (this is in fact also the case in the standard account but not as overtly acknowledged there).

Thomas has a **differential** view of additive *noch* in examples like (8) (repeated below). In this example, the scale is a scale of amounts (of children). The sentence expresses that, if 2 children sang previously, the full amount of singers is $2+1=3$.

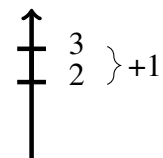
- (8) ADDITIVE reading (stressed NOCH)

(2 children sang)

Dann sang NOCH ein Kind.

then sang still one child

‘Then, another (lit. ‘still one’) child sang.’



This is similar to differential comparative examples like *2cm taller*, and this similarity is intentional: Thomas (2018) notes that in many languages, comparison and additivity are expressed the same (e.g. English *more* in *Three more children sang*).

Thomas’ account is based on Greenberg (2010)’s observation that in contrast to *too*, additive *more* requires the students that Mary met and those that John met to be **different** (8 students, all in all), see (32). I believe that this is also the case for German, see (33) for an example.

²I do not perceive such a difference between (1) and (2), but as discussed in section 6, the accenting pattern in these examples needs to be studied in greater detail in future work.

- (32) Yesterday John spoke with 4 students.
 a. Today Mary spoke with 4 more students.
 b. Today Mary spoke with 4 students too.
- (33) (Johann met 4 students)
 Heute hat Maria NOCH zwei Studierende getroffen.
 today has Maria still two students met
 ‘Today, Maria met 2 more students.’

This account is attractive for stressed NOCH because it seems to require a numeral. In German, the indefinite determiner and the numeral one are homophonous (*ein*). For this reason, it is not visible in examples such as (8) whether a numeral or an indefinite article is involved. Note however that plural indefinites are not possible (34a), while plurals with numerals are fine (34b).

- (34) a. #Dann sangen NOCH Kinder.
 then sang still children
 (intended:) ‘Then, other children sang.’
 b. Dann sangen NOCH zwei Kinder.
 then sang still two children
 ‘Then, another two children sang.’

Proper nouns, definite descriptions, etc. are not possible with stressed *noch*, see (35).

- (35) #Dann sangen NOCH Ali und Bea.
 then sang still Ali and Bea
 ‘Then, Ali and Bea sang in addition.’

Thomas uses a different framework (scale segment semantics), (36) is an attempt to adapt this to the current framework. According to this lexical entry, *noch* requires a salient individual x^* and salient degree d^* (represented here as parameters on the interpretation function).

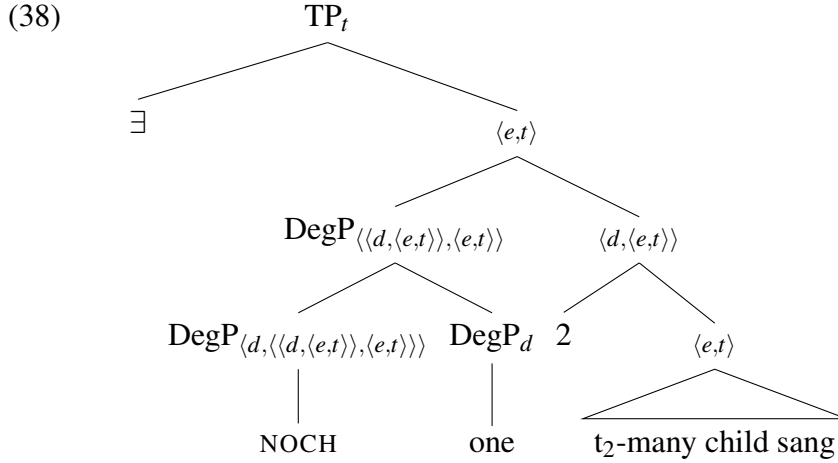
- (36) $[[\text{NOCH}]]^{S,x^*,d^*} = \lambda d_{diff}. \lambda G \in D_{\langle d, \langle e, t \rangle \rangle}. \lambda x: \underline{G(d^*)(x^*)}. G(d^* + d_{diff})(x^* \oplus x)$

The presupposition is similar to the standard account, namely that the salient individual x^* has a property G to the salient degree d^* . However, the assertion differs from the standard account: it incorporates the differential view just described. The first argument of *noch*, a degree argument d_{diff} , is basically interpreted as differential, in that all relevant individuals together have property G to degree $d^* + d_{diff}$.

(37)–(38) show how this analysis can account for the additive example in (8). The sister node to the DegP is assumed to denote a relation between a degree d and a property x such that (i) the amount of x is d , (ii) x is a child/are children, and (iii) x sang, see (37a). After combining with the differential degree (here ‘one’, see (37b)), *noch* receives this property as its second argument. The resulting assertion and presupposition are shown in (37c): (37) is true iff there is a plural individual (composed of the prementioned singers as well as some other x) composed out of $d^* + 1$, i.e. 3 atomic individuals, which are children and sang.

- (37) (Two children sang.)
 Dann sang NOCH ein Kind (‘Then, another (lit. ‘still one’) child sang)
 a. $[[2 \text{ t}_2 \text{ many child sang}]] = \lambda d. \lambda x. |x| = d \ \& \ x \text{ is a child} \ \& \ x \text{ sang}$
 b. $[[\text{NOCH one}]]^{S,x^*,d^*} = \lambda G \in D_{\langle d, \langle e, t \rangle \rangle}. \lambda x: \underline{G(d^*)(x^*)}. G(d^* + \text{one})(x^* \oplus x)$

- c. $[[\exists \text{ NOCH one } 2 \text{ } t_2 \text{ many child sang}]]^{S,x*,d*}$
 Presupposition: $|x^*|=d^*$ & x^* is a child & x^* sang
 Assertion: $\exists x[|x^* \oplus x|=d^* + \text{one} \text{ \& } x^* \oplus x \text{ is a child \& } x^* \oplus x \text{ sang}]$



For temporal uses (such as *Paul is still sick*), Thomas also assumes, intuitively, addition of an interval on a scale. Since this is not differential, I will leave it aside here. In the following, his account will be extended to examples such as (1).

5. Analysis

In (1) and (2), a factor phrase (*einmal so*) is added to the salient degree. I will assume that the same differential *noch* is needed (36).

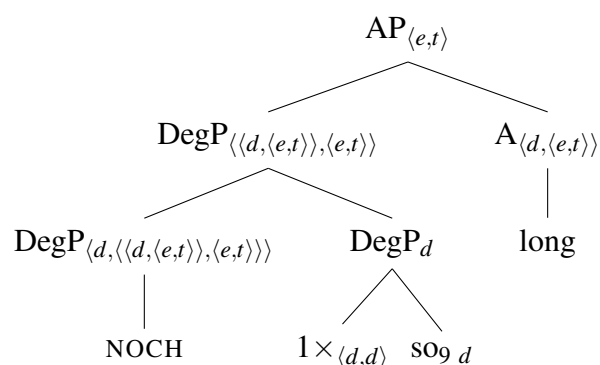
- (1) (The turtle previously weighed 16 grams)
 Jetzt ist sie **nochmal so schwer**.
 now is she still.once so heavy
 ‘Now it is twice (lit. still once) as heavy.’
-

- (2) (Their mean head-body length is 6cm)
 der Schwanz ist **nochmal so lang**.
 the tail is still.once so long
 ‘the tail is that long, too.’
-

$$(36) \quad [[\text{NOCH}]]^{S,x*,d*} = \lambda d_{diff}. \lambda G \in D_{\langle d, \langle e, t \rangle \rangle}. \lambda x: \underline{G(d^*)(x^*)}. G(d^* + d_{diff})(x^* \oplus x)$$

I will start with example (2), i.e. with the example with the ‘also like that’ reading. As can be seen in (39), the LF assumed for this example is somewhat less complex than that of the additive example discussed above.

(39)



Consider first the lower DegP. Here, *so₉* refers back to the previously mentioned degree 6cm, 1x (vacuously) multiplies this degree by one, see (40a). The resulting degree serves as the first argument for *noch*, as the differential degree argument (40b). The adjective denotes a relation between an individual and a degree and is thus a suitable second argument for *noch*, see (40c-d). (40e) shows the meaning of the complete sentence: it presupposes that there is a salient individual x^* and a salient degree d^* such that x^* is d^* -long, and asserts that x^* and the tail together are $d^*+6\text{cm}$ long. x^* is of course the body of the harvest mouse, and d^* is 6cm. Both are mentioned in the preceding sentence.

- (40) a. $[[1 \times \text{so}_9]]^g = 1 \times g(9) = 1 \times 6\text{cm} = 6\text{cm}$
b. $[[\text{NOCH } 1 \times \text{so}_9]]^{g, x^*, d^*} = \lambda x: \mathbf{D}_{\langle d, \langle e, t \rangle \rangle} . \lambda x: \underline{\mathbf{G}(d^*)(x^*)} . \mathbf{G}(d^* + 6\text{cm})(x^* \oplus x)$
c. $[[\text{long}]] = \lambda d. \lambda x. x \text{ ist } d\text{-lang}$
d. $[[\text{NOCH } 1 \times \text{so}_9 \text{ long}]]^{g, x^*, d^*} = \lambda x: \underline{x^* \text{ is } d^*\text{-long}} . x^* \oplus x \text{ is } d^* + 6\text{cm long}$
e. $[[\text{the tail is NOCH } 1 \times \text{so}_9 \text{ long}]]^{g, x^*, d^*}$
Assertion: $x^* \oplus \text{the-tail}$ is $d^* + 6\text{cm}$ long
Presupposition: x^* is $d^*\text{-long}$

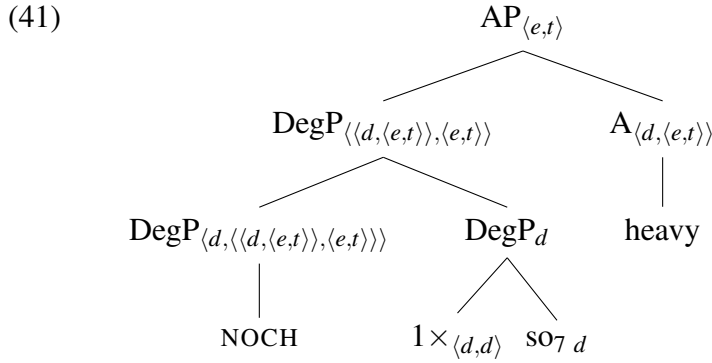
This account can therefore capture the meaning of (2) just as well as the alternative account, perhaps even better because it does not require a focus accent on the subject.³

In the following, I will turn to example (1). This was problematic under the standard account of *noch* because this account didn't capture the fact that *nochmal so* corresponds to 'twice as' in this reading.

- (1) (The turtle previously weighed 16 grams)
Jetzt ist sie **nochmal so schwer**.
now is she still/once so heavy
'Now it is twice (lit. still once) as heavy.'

The tree in this case is identical, see (41).

³It should be mentioned here that the account of Beck (2020) does not rely on focus-sensitivity, i.e. Beck proposes a variant of the standard account which would not run into this problem.



Correspondingly, the derivation of the sentence follows the same steps (see (42a–d)), yielding the sentence meaning in (42e). The crucial difference lies in the interpretation of x^* : x^* , the salient individual, is the same turtle as the subject of the sentence. For that reason, $x^* \oplus \text{the-turtle} = \text{the-turtle}$ (e.g. Nouwen, 2016)

- (42)
- a. $[[1 \times \text{so}_7]]^g = 1 \times g(7) = 1 \times 16\text{gr} = 16\text{gr}$
 - b. $[[\text{NOCH } 1 \times \text{so}_7]]^{g,x^*,d^*} = \lambda G \in D_{\langle d, \langle e, t \rangle \rangle}. \lambda x: G(d^*)(x^*). G(d^* + 16\text{gr})(x^* \oplus x)$
 - c. $[[\text{heavy}]] = \lambda d. \lambda x. x \text{ ist } d\text{-heavy}$
 - d. $[[\text{NOCH } 1 \times \text{so}_7 \text{ heavy}]]^S = \lambda x: \underline{x^* \text{ is } d^*\text{-heavy. } x^* \oplus x \text{ is } d^* + 16\text{gr heavy}}$
 - e. $[[\text{The turtle is NOCH } 1 \times \text{so}_7 \text{ heavy}]]^S$
 Assertion: $x^* \oplus \text{the-turtle}$ is $d^* + 16\text{gr}$ heavy
 $= \text{the-turtle}$ is $d^* + 16\text{gr}$ heavy
 Presupposition: x^* is $d^*\text{-heavy}$

Another thing to note is that, on first glance, the presupposition (the turtle weighs 16 grams) and the assertion (the turtle weighs 32 grams) seem to be incompatible. But recall that the assumed meaning of ‘the turtle weighs 16 grams’ corresponds to the turtle weighs **at least** 16 grams’. Therefore, as noted above, the assertion entails the presupposition, and the presupposition is compatible with the assertion, see (43).

- (43)
- WEIGHT(the-turtle) $\geq 32\text{gr}$
 $\rightarrow \text{WEIGHT(the-turtle)} \geq 16\text{gr}$

5.1. Aside: Reading as *again*

Noch(ein)mal has another reading as *again*, see (44). Note that while *again* and German *wieder* allow for two different readings, called *repetitive* and *restitutive* in the literature (e.g. Beck, 2005). Under the repetitive reading, which is possible with *nochmal*, an action is repeated. For example, in (44), it is presupposed that Ali had left before the reference time, and asserted that he left (once more) at the reference time. Under the restitutive reading (not available for *nochmal*), an action is reversed: Ali arrived, and then he left again.

- (44) Ali ging noch(ein)mal.
 Ali left still.once
 ‘Ali left ‘again’ / once more.’
 (i) repetitive: Ali had left before
 (ii) #restitutive: Ali had been away before

Correspondingly, the factor phrase *n-mal* has a verbal counterpart, too, see (45).

- (45) Ali ging einmal.
 Ali left once
 ‘Ali left once.’

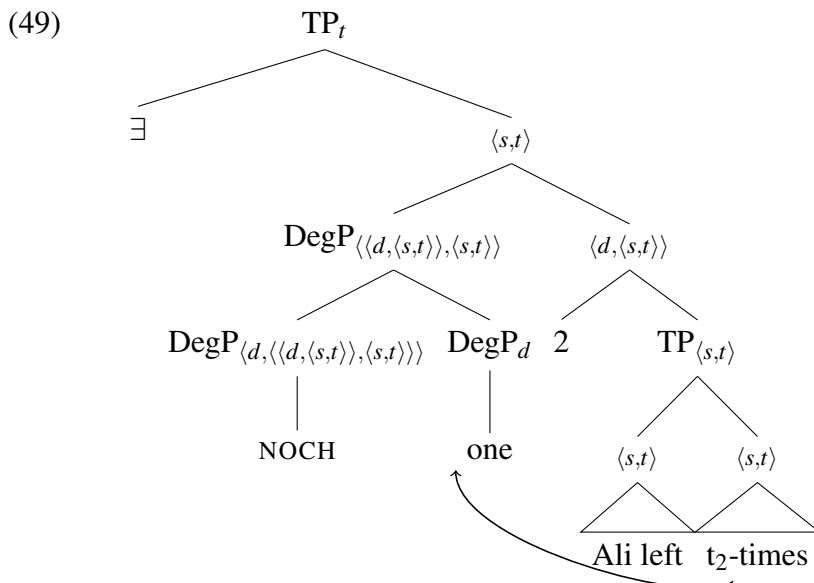
Gobeski (2019: §3.2, p.68) proposes the simplified variant of the meaning of *n-times* in (46). He assumes that it modifies entities of type $\langle s, t \rangle$ (47). This account requires existential closure.

- (46) $[[n\text{-times}]] = \lambda e[*\text{time}(e) \wedge |e| = n]$
 (47) a. $[[\text{Ali left}]] = \lambda e. \text{leave}(\text{Ali})(e)$
 b. $[[\text{three times}]] = \lambda e[*\text{time}(e) \wedge |e| = 3]$
 c. $[[\text{Ali left three times}]] = \lambda e. \text{leave}(\text{Ali})(e) \wedge *\text{time}(e) \wedge |e| = 3$

A brief aside: Gobeski assumes that the **time* predicate requires that the event *e* is plural, since *times* requires a numeral greater than 1. In German, there is no such requirement, so I will assume instead that **time* is number-neutral.

A tentative proposal for this reading of *nochmal* would thus involve events instead of individuals, see (48) as well as the LF in (49). A derivation is shown in (50).

- (48) $[[\text{NOCH}]]^{S,e*,s*} = \lambda d_{diff}. \lambda G \in D_{\langle d, \langle s, t \rangle \rangle}. \lambda e: \underline{G(d^*)(e^*)}. G(d^* + d_{diff})(e^* \oplus e)$



- (50) a. $[[\text{-time(s)}][[= \lambda d. \lambda e[* \text{time}(e) \wedge |e| = d]$
b. $[[2 \text{ Ali left } t_2\text{-times}]] = \lambda d. \lambda e. \text{leave}(\text{Ali})(e) \wedge * \text{time}(e) \wedge |e| = d$
c. $[[\text{NOCH one}]]^{S, e^*, s^*} = \lambda G \in D_{\langle d, \langle s, t \rangle \rangle}. \lambda e: G(d^*)(e^*). G(d^* + \text{one})(e^* \oplus e)$
d. $[[\text{NOCH one 2 Ali left } t_2\text{-times}]]^{S, e^*, s^*} = \lambda e: \text{leave}(\text{Ali})(e^*) \wedge * \text{times}(e^*) \wedge |e^*| = d^*.$
 $\text{leave}(\text{Ali})(e^* \oplus e) \wedge * \text{times}(e^* \oplus e) \wedge |e^* \oplus e| = (d^* + \text{one})$
e. $[[\exists \text{ NOCH one 2 Ali left } t_2\text{-times}]]^{S, e^*, s^*} = \exists e: \text{leave}(\text{Ali})(e^*) \wedge * \text{times}(e^*) \wedge |e^*| = d^*.$
 $\text{leave}(\text{Ali})(e^* \oplus e) \wedge * \text{times}(e^* \oplus e) \wedge |e^* \oplus e| = (d^* + \text{one})$
Assertion: There is an event e such that Ali left in $e^* \oplus e$, and $|e^* \oplus e| = d^* + \text{one}$
Presupposition: Ali left in e^* , and $|e^*| = d^*$

This is a sketch of how such a variant might work. It intuitively captures the fact that the reading of *nochmal* is repetitive (repeating an action) rather than restitutive (reversing an action). In addition, the fact that there are factor phrases in the verbal domain, too, also does not speak against the idea of treating *nochmal* as *noch* ('still') + *einmal* (factor phrase 'once'). However, further details of the analysis are left for future research.⁴

6. Summary and open issues

6.1. Summary

This paper discussed *noch(ein)mal so*. It was argued that *noch(ein)mal so* is decomposable into *noch* (= phasal/aspectual particle *still, in addition*), *(ein)mal* (= factor phrase *once*) and *so* (= degree pronoun *that*). Two examples, representing two possible readings of *noch(ein)mal so*, were shown: (1) and (2). In the former, *noch(ein)mal* is translated as 'twice as', in the latter as 'that ..., too'.. It was argued that these examples are puzzling for the standard account of *noch* in (3) because they are differential.

- (1) (When we bought our turtle, it weighed 16 grams)
Jetzt ist sie **nochmal so schwer**.
now is she still.once so heavy
'Now it is twice (lit. still once) as heavy.'
- (2) Ihre Kopf-Rumpf-Länge beträgt durchschnittlich 6 cm, der Schwanz ist **nochmal**
their head-body.length amounts.to mean 6 cm the tail is still.once
so lang.
so long
'Their mean head-body length is 6cm, the tail is that long, too.'

The standard account is exemplified by the lexical entry in (51). It importantly does not assume that *noch* contributes to the truth conditions of the sentence.

⁴See Feldscher (2019) for the observation that in some dialects of English, an additive/differential *again* occurring in equatives is possible.

(i) Neville is half again as tall as Pansy. (1.5x)

(ii) Pansy is four feet tall. Neville is that again. (2x Pansy's height)

If this turns out to be related to the phenomenon discussed here, it may be problematic for my analysis, since *again* is not decomposable in this way.

- (3) $[[noch]]^{S,x*} = \lambda x. \lambda P \in D_{\langle x,t \rangle}: x^* \prec_S x \ \& \ P(x^*)]. P(x)$
 ‘true if entity x has property P ; triggers the presupposition that a salient entity x^* is ranked lower on a salient scale S and also has property P ’

It was argued instead that in these examples, *noch* has an effect on the truth conditions, and that this is particularly visible in examples like (1).

I adopted and adapted the differential account of Thomas (2018) for additive NOCH to account for these examples, see (36) for my variant of it.

- (36) $[[NOCH]]^{S,x*,d*} = \lambda d_{diff}. \lambda G \in D_{\langle d, \langle e,t \rangle \rangle}. \lambda x: \underline{G(d^*)(x^*)}. G(d^* + d_{diff})(x^* \oplus x)$

This yields the ‘twice as’ reading when the summed individuals are the same, and the ‘also like that’ reading when they differ.

6.2. Open issues

One open issue is the question **what individuals can be summed in this way** (see Greenberg, 2010; Grubic and Wierzba, 2021: for related discussions). It seems to me that there has to be a connection — the summed individuals have to belong together in some way (e.g. as two parts of the same object). This is why the harvest mouse example, summing two parts of a harvest mouse (body and tail), is entirely felicitous, whereas I perceive examples like (51) to be less felicitous.

- (51) (This hair is 14cm long)
 ?Mein Bleistift ist nochmal so lang.
 my pencil is still. once so long
 ‘My pencil is that long, too.’

Relatedly, **the relation to unstressed additive *noch*** is unclear. It was essentially proposed above that *noch* in these *nochmal so* examples is closely related to stressed additive *noch* in Thomas’ account. Unstressed *noch* is however more versatile, it does not have to combine with a degree, see e.g. (52).

- (52) First, three grown-ups sang.
 a. Dann sangen noch (zwei) KINDER
 then sang still two children
 ‘Then, two/some children sang in addition.’
 b. Dann sangen noch ALI UND BEA.
 then sang still Ali and Bea
 ‘Then, Ali and Bea sang in addition.’

In Grubic and Wierzba (2021) we tentatively suggest that *noch* statements also provide answers to implicit degree questions (*how many...?*). This may provide a link to the uses discussed here, albeit a weak one.

Third, a reviewer raised the question what role time plays with stressed additive NOCH in (8) and in the turtle example (1), which appear to involve a change in time. Note however that there is no change in time in examples like (2).

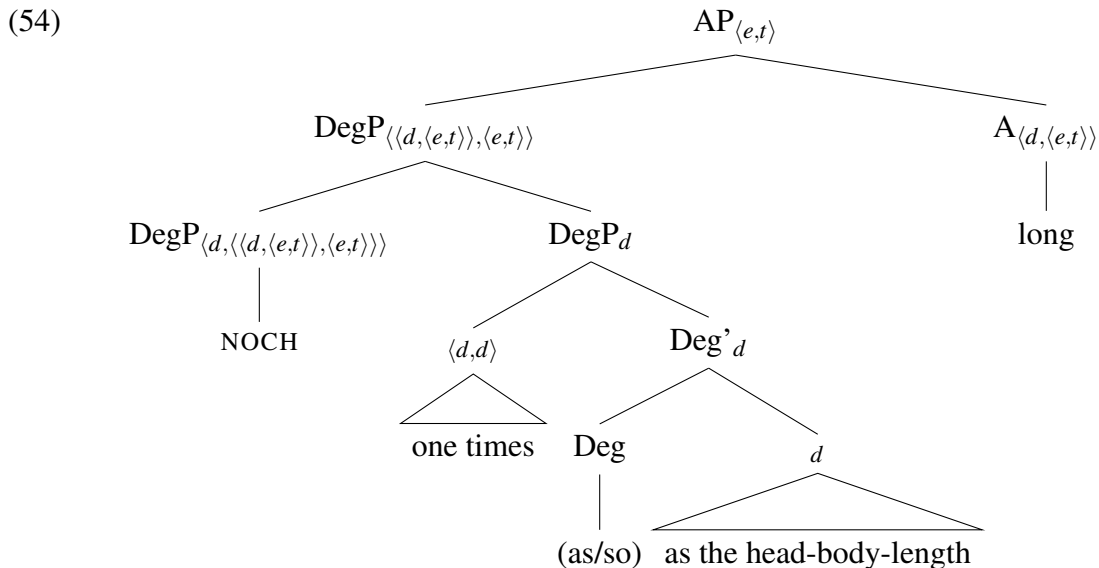
- (8) Dann sang NOCH ein Kind.
 then sang still a child
 ‘Then, another child sang.’

This is an interesting question which needs to be further investigated. Umbach (2012) provides examples suggesting that in the case of additive *noch*, the temporal order is flexible, i.e. the presupposed proposition does not necessarily take place earlier than the reference time. For unstressed *noch*, we proposed in Grubic and Wierzba (2021) that topic situations (rather than times) play a role, instead. It remains an open question whether this is applicable to *noch(ein)mal* as well.

Fourth, another reviewer pointed out that **degree complements are possible**, see e.g. the variant of the harvest mouse example in (53).

- (53) Der Schwanz ist noch einmal so lang wie die Kopf-Rumpf-Länge.
 the tail is still once so long as the head-body-length
 ‘The tail is as long as the head-body-length.’

This is, on first glance, problematic for my account because the standard account for *so* in equatives differs from the degree pronoun account stated above. A tentative suggestion for a future path of research might be to see whether equative *so* in this example can be analyzed as cataphoric and coreferring with the subsequent *wie*-phrase (as mentioned in Umbach 2007). If it turns out that *so* is different in the two examples, Gobeski and Morzycki (2017); Gobeski (2019) treat English *as*-phrases in equatives (corresponding to the *wie*-phrase in (53)) as referring to a degree. For example, Gobeski (2019: §4.4) assumes the structure in (54), with the *as* corresponding to German *so* in (53) semantically vacuous.



Fifth, further suggestions by members of the audiences at Sinn und Bedeutung and the syntax/semantics colloquium in Potsdam require experimental work on the production and interpretation of such utterances. It was suggested to me that there might be a **difference in intonation** between the two different readings, one reading (the ‘twice as’ reading, I believe) being more salient with stress on *mal* (*nochMAL*) and the other with stress on *noch* (*NOCHmal*). In addition, audience members at SuB pointed out that my account suggests that **examples with other factor**

phrases such as (56) are acceptable. Such examples however received mixed reactions from German-speaking audience members. I myself am conflicted about it: it sounds okay to me, but I can't properly distinguish which reading this has: is the tail twice as long as the prementioned degree, or three times as long?

- (55) ?Der Schwanz ist noch zweimal so lang.
 the tail is still two.times so long

Finally, it needs to be explored whether this analysis may be applicable to other 'degree' uses of *noch*, and degrees need to be explored independently. For example, there is a use of *noch* with gradable adjectives which is found in Swiss German but not in Standard German. Under this reading, it seems to be a degree word similar to *quite*, see (56). Is this use in any way related to the readings discussed here?

- (56) 'Swiss *noch*' (Grubic, 2020)
 Dr Ali isch no gross.
 the Ali is NOCH tall
 'Ali is quite tall.'

And *noch* can be found in comparatives, see (57). In this case, it is standardly translated as 'even', and introduces norm-relatedness (at least in some examples, see Umbach 2009): In contrast the comparative without *noch*, 'Ali is taller than Bea', which does not entail that either of them is tall, (57) entails that both Ali and Bea are tall.

- (57) Comparative *noch* (Umbach, 2009)
 Ali ist NOCH größer als Bea.
 Ali is still taller than Bea
 'Ali is even taller than Bea.'

(57) was analyzed by Umbach as an instance of additive NOCH, dependent on a salient other comparison, but does not appear to be differential!

In general, the two readings discussed in this paper are reminiscent of readings found with **comparatives**. Gobesky notes that (58), with a factor phrase and a comparative, can have two readings (depending on the speaker, some do not accept all readings):

- (58) Floyd is three times taller than Clyde.
 a. Clyde is 50cm, Floyd is 1.50m
 b. Clyde is 50cm, Floyd is 2m

The data here of course involve equatives, which are not ambiguous in English:

- (59) Floyd is three times as tall as Clyde.
 a. Clyde is 50cm, Floyd is 1.50m
 b. #Clyde is 50cm, Floyd is 2m

Nevertheless, recalling the idea that *noch* is related to comparison (Thomas, 2018), this may be a further parallel to consider.

References

- Beck, S. (2005). There and back again: A semantic analysis. *Journal of Semantics* 22, 3–51.
- Beck, S. (2012). DegP scope revisited. *Natural Language Semantics* 20, 227–272.
- Beck, S. (2016). Temporal *noch/still* and further-to readings of German *noch*. In N. Bade, P. Berezovskaya, and A. Schöller (Eds.), *Proceedings of Sinn und Bedeutung* 20, pp. 4–25.
- Beck, S. (2020). Readings of scalar particles: *noch/still*. *Linguistics and Philosophy* 43, 1–67.
- Eckardt, R. (2007). ‘Was noch?’ Navigating in question answer discourse. In A. Späth (Ed.), *Interfaces and interface conditions*, pp. 78–95. Berlin: de Gruyter.
- Feldscher, C. (2019). *Natural Language Addition via Degrees, Events, and Focus*. Ph. D. thesis, Michigan State University.
- Gobeski, A. (2019). *Factor Phrases: The Semantics of Multiplicative Modification of Events, Degrees, and Nominals, and the Grammar of Arithmetic*. Ph. D. thesis, Michigan State University.
- Gobeski, A. and M. Morzycki (2017). Percentages, relational degrees, and degree constructions. In D. Burgdorf, J. Collard, S. Maspong, and B. Stefánsdóttir (Eds.), *Proceedings of SALT* 27, pp. 721–737.
- Greenberg, Y. (2010). Additivity in the domain of eventualities (or: Oliver Twist’s *more*). In M. Prinzhorn, V. Schmitt, and S. Zobel (Eds.), *Proceedings of Sinn und Bedeutung* 14, pp. 151–167.
- Grubic, M. (2020). *Noch* as a degree word in Swiss German. Talk presented at the DegPol Workshop at ZAS, 09.03.2020.
- Grubic, M. and M. Wierzba (2021). The German additive particle *noch*: Testing the role of topic situations. *Glossa: A Journal of General Linguistics* 6(1).
- Hohaus, V. and M. Zimmermann (2021). Comparisons of equality with German *so...wie*, and the relationship between degrees and properties. *Journal of Semantics* 38(1), 95–143.
- Ippolito, M. (2007). On the meaning of some focus-sensitive particles. *Natural Language Semantics* 15, 1–34.
- König, E. (1977). Temporal and non-temporal uses of *noch* and *schon* in German. *Linguistics and Philosophy* 1, 173–198.
- König, E. (1991). *The Meaning of Focus Particles. A Comparative Perspective*. London: Routledge.
- Löbner, S. (1989). German *schon – erst – noch*: An integrated analysis. *Linguistics and Philosophy* 12, 167–212.
- Nouwen, R. (2016). Plurality. In M. Aloni and P. Dekker (Eds.), *The Cambridge Handbook of Formal Semantics*, pp. 267–284. Cambridge University Press.
- Thomas, G. (2018). Underspecification in Degree Operators. *Journal of Semantics* 35(1), 43–93.
- Umbach, C. (2009). Comparatives combined with additive particles: The case of German *noch*. In A. Riester and T. Solstad (Eds.), *Proceedings of Sinn und Bedeutung* 13, pp. 543–558.
- Umbach, C. (2012). Strategies of additivity: German additive *noch* compared to *auch*. *Lingua* 122(15), 1843–1863.
- Umbach, C. and C. Ebert (2009). German demonstrative *so* – intensifying and hedging effects. *Sprache und Datenverarbeitung (International Journal for Language Data Processing)* 1-2, 153–168.