

Graphical Grammar

A historical survey until 1955

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October 27, 2024

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Chapter 1

Visualising sentence structure

Chapter 2

German pedagogical proposals

2.1 Introduction

2.2 *Deutsche Sprachlehre* (Moritz 1782)

[2.1] Karl Philipp Moritz (1756-1793) was a prolific author with wide ranging interests. Towards the end of his life he became professor for the arts at the *Königliche Akademie der Künste* in Berlin. Among his many writings there are various instructional books and articles about grammar, see Schmidt (1993) for a concise summary of his linguistic oeuvre. Of particular interest here is the *Deutsche Sprachlehre für die Damen in Briefen* (Moritz 1782). The context and linguistic content of this work is discussed in more detail by Buhofer (1994). This book was quite successful, being reprinted in 1791, 1794 and 1806. All later editions dropped the somewhat curious addition *für die Damen* from the title.

[2.2] The *Deutsche Sprachlehre* contains to my knowledge the first graphical display of a grammatical analysis. In the *Zehnter Brief: Von dem Bau der Rede*, starting on page 267, Moritz discusses various simple examples, culminating in two large fold-out page-inserts between pages 308 and 309, reproduced here in Figure 2.1 and Figure 2.2. Later, in the first volume of his 1793 *Grammatisches Wörterbuch der deutschen Sprache* there is a short summary of this grammatical analysis under the heading of *Construcktion* (Moritz 1793: 283-295). After Moritz' early demise that same year (at only 37 years of age) this *Grammatisches Wörterbuch* was completed by other authors without any further mentioning of this new kind of sentence analysis. The most extensive exposition of Moritz' envisioned analysis thus remains the discussion in the 1782 *Deutsche Sprachlehre*.

[2.3] Moritz' linguistic analysis is particularly noteworthy because it is an early version of what later will be called a *Satzgliedanalyse* ('phrasal analysis'). Although Moritz consistently talks about the "words" of the sentence, he clearly intends these "words" to be something closer to what today would be called phrases. These phrases are classified into various functions, using German labels for didactic purposes (e.g. *Grund*=subject, *Ziel*=accusative object, *Zweck*=dative indirect object). Forsgren (Forsgren 1985: 76), discussing the origin of such phrasal analyses at the end of the 18th Century, argues that Moritz' approach is one of the earliest examples of a phrasal analysis and his ideas appears to be developed independently from other contemporaries.

[2.4] Examining the details of this visual display, each clause can be identified by a large bracket. Within each clausal bracket there is a table-like structure with function-names on top and the actual words of the clause below. Each clause consists of *Grund* ("subject") and *Rede*

(“predicate”), with possibly additional syntactic functions like *Ziel* (“accusative object”), *Zweck* (“dative object”) or *Bindung* (“conjunction”). Optional elements like *Hinanfügung* (“adverbial phrase”) and *Einschiebung* (“interjection”) are placed loosely below the main syntactic functions, implicitly hinting at an argument/adjunct distinction. Various details are not completely thought through and the examples are sometimes slightly inconsistent. For example, the phrase *von der Schulter* in clause 11 is analyzed as an adverbial *Hinanfügung*, while the completely parallel *auf die Schulter* in clause 18 is analyzed as an object-like *zweites Ziel*.

More interesting is the treatment of subordinate clauses. Subordinate clauses are given [2.5] a function in the matrix clause and then are further analyzed within a new bracket as a separate clause below. This can be seen in Figure 2.2 with the analysis of direct speech in clause 13, which is the *Ziel* of the matrix clause 12. Likewise, the adverbial *um zu+Infinitiv* subordinate clause 21 is the *Zweck* of the matrix clause 20.

This display of subordinate clauses is no coincidence. In the text there is an explicit discussion [2.6] of this analysis of subordinate clauses (Moritz 1782: 299-300) based on the example sentence (2.1). This sentence is analyzed by Moritz into four separate clauses. The four clauses and their functions in the superordinate clause are listed in (2.1 a-d), as shown in Figure 2.3. Each of these subordinate clauses is subsequently analyzed using the same clausal analysis structure as the superordinate clause, as can be seen in Figure 2.4.

- (2.1) Wenn ich meine Pflicht thue, so fühle ich, daß mir dieses genug ist, um vergnügt und glücklich zu sein.
 - a. Grund und Rede: *so fühle ich*
 - b. Ziel: *daß mir dieses genug ist*
 - c. Zweck: *um vergnügt und glücklich zu sein*
 - d. Hinanfügung: *wenn ich meine Pflicht thue*

Nitpicking one might argue that this analysis of the complex sentence is not completely [2.7] correct. Clause 2 from Figure 2.4 is not a separate clause but the superordinate clause itself. Further, The subordinate part *um vergnügt und glücklich zu sein* is analyzed in Figure 2.3 as *Zweck* (‘reason’, confusingly a label otherwise also used for dative arguments by Moritz). However, this clause is not directly subordinate to the main clause *so fühle ich* but it is secondary subordinate to the *Ziel* complement clause *daß mir dieses genug ist*.

Notwithstanding these inaccuracies, Moritz’ analysis shows a clear understanding of subordinate clauses simultaneously having an internal functional structure and, as a whole clause, having a function inside a superordinate structure. Anachronistically interpreting this as a constituency analysis, this sentence can be displayed as shown in Figure 2.5. Note that this is somewhat akin to an “underlying” structure as the ordering does not correspond to the original sentence. Moritz consistently applies the same functional structure on each clause (viz. the ordering *Grund-Rede-Ziel-Zweck-Hinanfügung*). The numbering in this examples indicates the eventual ordering in the resulting sentence.

Summarizing, Moritz appears to have a clear understanding of, first, phrases as the basis [2.9] of syntactic analysis. Second, he assigns a syntactic function to each phrase. Third, his examples indicate a basic, through rather implicit, understanding of adjuncts as less crucial phrases (*Hinanfügung*) that are visually displayed below the main constituents. Fourth, subordinate clauses have their own clausal structure, while the subordinate as a whole is assigned a function in the superordinate clause, which is a clear precursor of constituency structure. Finally, in the text he explicitly mentions that the ordering of the elements in the actual sentence is slightly different from the ordering in his analyses, and he hints at rules

that determine how the abstract “underlying” structure has to be reordered into the actual form.

[2.10] All these theoretical concepts are quite charmingly summarized by his graphical display, which can be interpreted as a kind of precursor of a constituency structure. Apparently appearing completely out of the blue, the idea of using graphics to elucidate grammatical structure is off to a great start with these proposals from Moritz’ *Deutsche Sprachlehre*. Unfortunately, his approach does not have had any following and it would take another 50 years for graphical methods to be used again for grammatical analysis.

2.3 *Periodenbau der deutschen Sprache* (Herling 1823)

[2.11] Simon Heinrich Adolf Herling (1780-1849) was a teacher in Frankfurt am Main and founding member, and later main organizer, of the *Frankfurter Gelehrtenverein für deutsche Sprache*. His analysis of multi-clause sentences is widely considered foundational for the grammatical analysis of German. A wide-ranging appraisal of Herling’s work can be found in Elmentaler (1996). Herling is a close friend and colleague to Ferdinand Becker (see Section 2.4), who is also an active member of the *Frankfurter Gelehrtenvereion*. A plan to write a joint grammar fell apart, indicating different opinions in their approach to grammatical analysis (Haselbach 1966: 69). Their relation remains amicable, as indicated by the fact that the first part of Herling’s *Syntax der deutschen Sprache* (Herling 1830) is dedicated to Becker.

[2.12] Strictly speaking, the work of Herling does not include any graphical display of grammatical analysis. However, his work is still included here because he introduces some notation that will be expanded upon graphically by later authors, especially Lehmann (see Section 2.6) and Götzinger (see Section 2.7). Herling’s notational framework is first introduced in the *Grundregeln des deutschen Stils oder der Periodenbau der deutschen Sprache. Ein Lehrbuch für den stilistischen Unterricht* (Herling 1823), which later becomes the second part of *Die Syntax der deutschen Sprache* (second edition 1827, third edition 1832).

[2.13] In this book Herling analyses the different ways complex sentences are build from multiple clauses. He uses the term *Periode* for the complex sentence, a term that goes straight back to antiquity. Aristotle uses the term *περίοδος* ‘periodos’ to describe something akin to a complete sentence, consisting of multiple clauses (with *κῶλον* ‘kolon’ being used for something akin to a clause). Burkett explains that “the term *periodos* is one of Aristotle’s visual metaphors, suggesting a circular motion or completeness of thought and rhythm.” (Burkett 2011: 206).

λέγω δὲ περίοδον λέξιν ἔχονσαν ὀρχήν καὶ τελευτὴν αὐτῆν καθ’ αὐτὴν καὶ μέγεθος εὐσύνοπτον (Aristoteles, Rhetorica III 9.3)¹

(‘I call a period an expression having a beginning and an end in itself and a magnitude easily taken in at a glance.’ translation by Burkett 2011: 206)

[2.14] The term *Periode* as a grammatical term for the complex sentence is widespread in German 18th and 19th Century grammatical texts. It is used already by Meiner (1781: 446) and Heyse (1814: 491) and appears in all didactic works to be discussed later in this chapter.

[2.15] In a short note inserted in the main text, Herling proposes a special notation *um die Umformungen kürzer zu bezeichnen, und so leichter überschauen zu können* (‘to succinctly mark the transformations and thus be able to survey them more easily’ Herling 1823: 177). The

¹Original online at the Perseus Digital Library <<http://data.perseus.org/citations/urn:cts:greekLit:tlg0086.tlg038.perseus-grc1:3.9.3>>.

usage of the term *Umformung* deserves its own discussion, which will not be pursued here. The special notation is summarized slightly clearer in the second and third edition (e.g. Herling 1832: 232). The version from the third edition is shown here in the Figure 2.6, which can be translated as follows:

For the succinct marking of the sentences and their syntactic relationships may the following symbols be of use: h indicates grammatical main sentence; b adjective clause, β , when it is shortened; a adverbial clause, α , the same shortened; s nominal clause, σ the same shortened. The exponents, e.g. a^2 indicate the grammatical grade, to h e.g. h^2 the grade of the logical gradation; $h/2$, $h/3$, indicates that the main clause, or $a/2$, $a/3$ that the adverbial clause is separated into two or three parts. The coefficients e.g. $2h$ indicate the number of equivalent main clauses; with a , b , s their relationship to the main clauses, often their coordination. (Herling 1832: 232)

Herling does not use his notations consistently throughout his book. There are only a few [2.16] incidental examples and there are almost no sentences completely marked according to his system. The example in (2.2) is one of the more interesting and complex cases (Herling 1832: 233). Yet, in contrast to intended purpose, the abstract analysis with letters and numbers, interspersed inside the sentence, does not really ease the quick appraisal of the sentence structure, in my opinion.

- (2.2) Um (α) dem Soldatenstande zu entgehen, gegen den (b^2) er, ungeachtet (α^3) seinen unternehmenden Geistes und kräftigen Körpers, entschiedene Abneigung fühlte, verdingte er sich, (1h) im sechszehnten Jahre, bei einem Gastwirthe an der Gränze als Fuhrknecht, und (2h) kehrte erst nach sieben Jahren, da (2a) eben in seinem Geburtsorte ein nicht ganz unbedeutendes Grundstück feil geboten ward, in die Heimath zurück. (Herling 1832: 233)

Interpreting Herling's analysis in modern terms, his symbols can be seen as a constituency [2.17] structure. All clauses in the complex sentence are given a label and are related to each other in a hierarchical fashion, distinguishing coordination (viz. number in front) from subordination (viz. special letters for different kinds of embedding and superscript numbers to indicate deeper levels of embedding). Crucially, the clauses are linked to each other without using specific words as anchor points, like they would be in a dependency structure (cf. Becker's sentence analysis of a complex sentence, see Section 2.4). Figure 2.7 shows an interpretation of Herling's analysis from (2.2) in the form of a constituency tree.

2.4 Deutsche Grammatik (Becker 1829)

Karl Ferdinand Becker (1775-1849) one of the highly influential grammatical educators from [2.18] the start of the 19th Century.

(Haselbach 1966)

In the introduction to the 1829 *Deutsche Grammatik* (Becker 1829: xvii-xix), even before [2.19] he really starts the exposition of the grammar of German, Becker presents a few examples [2.20] of how complete sentences should be analyzed.

- (2.3) Wallenstein wußte längst den Inhalt ihrer Sendung als die Abgesandten des Kaisers ihm vor die Augen traten.

CoNLL-U table-format of Figure 2.8 with only slight cosmetic simplifications of the names [2.21] for the dependency relations.

#	global.columns = ID FORM UPOS DEPREL HEAD			
1	Wallenstein	Substantiv Nom.	Subjekt	0
2	wußte	Verb Imperf.	Prädikat	1
3	längst	Adverb	der Zeit	2
4	den Inhalt	Substantiv Akk.	Gethanes (Gewußtes)	2
5	ihrer Sendung	Substantiv Gen.	Attributiv	4
6	als	Konjunktion	Adverbialsatz der Zeit	2
7	die Abgesandten	Substantiv Nom.	Subjekt	6
8	des Kaisers	Substantiv Gen.	Attributiv	7
9	ihm	Personalpronomen Dat.	Persönliches Objekt	11
10	vor die Augen	Substantiv mit Präp.	Ortsverhältniß	11
11	traten	Verb Imperf.	Prädikat	7

[2.22] subordinate sentences in (Becker 1833: 38-46) (*Eigenschaftssatz*=relative clause, *Dingsatz*=complement clause)

- (2.4) Jakob schickte seinen jüngsten Sohn nicht mit den übrigen nach Aegypten, weil schon einmal ein Sohn, den er ausgesandt hatte, nicht zurückgekehrt war, und weil er fürchtete, daß auch diesem ein Unfall begegnen möchte.

2.5 Lateinische Syntax (Billroth 1832)

[2.23] At the end of his short life, Johann Gustav Willhelm Billroth (1808-1836) became professor for religion at the university in Halle. Before that, between his *Habilitation* in Leipzig in 1830 and the start of his position in Halle in 1834, he worked as a teacher for latin (Alwast 2000). In that context he wrote two latin grammars for use in schools, first the *Lateinische Syntax für die obern Klassen gelehrter Schulen* (Billroth 1832), later followed by the *Lateinische Schulgrammatik für alle Klassen* (Billroth 1834).

[2.24] In these grammars there is a single graphical display of a grammatical structure, shown below in Figure 2.11 (Billroth 1832: 102). There is not much known about the grammatical background of Billroth, nor is there any indication in his books about the inspiration for drawing a grammatical analysis. There are some indications that Billroth was influenced by Heyse's grammar of German (see below), specifically the fourth edition (Heyse 1827). However, the idea of drawing a sentence structure is nowhere to be found in Heyse's work, so this approach seems to be a genuinely new idea of Billroth.

[2.25] The influence of Heyse on Billroth can be inferred by the usage of the peculiar tripartite basic sentence structure of subject, predicate and copula. Even more clearly, Heyse's influence is indicated by the metaphor of the *nackte* 'naked' and *bekleidete* 'dressed' sentence. The origin of this terminological distinction can be traced back to Meiner (1781: 446), who uses the terms *bloß* 'bare' for a minimal sentence and *ausgebildet* 'developed' for a sentence with additional modifiers. Contemporaneously, Adelung (1782: 572) uses the terms *einfach/nackt* 'simple/naked' and *ausgebildet* 'developed'. This terminology is slightly changed in the first edition of Heyse's grammar of German (Heyse 1814: 492-492) into *einfach/rein* 'simple/pure' and *ausgebildet/erweitert* 'developed/extended'. Then Heyse adjusted this again in the second edition by adding the term *nackt* 'naked, bare' as an alternative to *einfach* and *rein* (Heyse 1820: 598). Finally, in the fourth edition of 1827 he adds the term *bekleidet* 'dressed':

Solche Sätze [...] kann man AUSGEBILDETE, erweiterte, oder (im Gegensatze zu den nackten) BEKLEIDETE Sätze nennen. (Such sentences can be called "developed", "extended" or (opposite to "naked") "dressed" sentences.) (Heyse 1827: 636)

In Billroth's syntax, the whole discussion of the structure of the sentence takes 11 pages [2.26] (Billroth 1832: 91-102). The structure of the text is really difficult to follow, although on closer inspection there is a clear drawn-out organisation. First, he introduces the simple 'naked' sentence as option A:

Ein Satz ist entweder: A. ein einfacher (oder nackter) d.h. ein solcher, welcher bloß aus Subject, Prädicat und Copula besteht. ('A sentence is either: A. a simple (or naked) one i.e. one such that it only consists of subject, predicate and copula,' Billroth 1832: 91)

It takes 8 pages of explanations of the simple sentence until finally the expected follow-up [2.27] to the option A occurs. Without clear formatting, the option B is announced innocuously on page 97, using a rather strange sentence structure that only makes sense when it is read immediately after the option A as quoted above.

B. oder ein bestimmter (bekleideter) d.h. ein solcher, wo entweder ein einzelner Theil oder mehrere durch Zusätze näher bestimmt werden ('B. or a determined (dressed) one, i.e. one such, in which either a single part or multiple parts are further determined by additions,' Billroth 1832: 97)

Then it takes another 5 pages of explanations of different kinds of such "dressed" sentences until finally this topic is closed with the conclusion quoted below. Billroth simply states (without explanation) that the example sentence (2.5) is 'dressed' as illustrated in Figure 2.11. In this quote, Billroth takes the metaphor of the naked/dressed sentence even one step further by using the term *Körper* 'body' for the naked sentence. [2.28]

*Auf diese Weise wird z.B. folgender Satz (2.5), dessen Körper eigentlich nur aus dem Subj.: Miltiades und dem Prädicat (mit dem Copula) reddidit besteht, bekleidet: ('In this way, the following sentence, whose body only consists of the subject Miltiades and the predicate (with copula) *reddidit*, is dressed,' Billroth 1832: 102)*

(2.5) Miltiades, dux Atheniensium, toti Graeciae libertatem paene oppressam in pugna apud Marathonem reddidit.

Interpreting his graphical illustration in more detail, the naked sentence is depicted by [2.29] a horizontal line, while the additional elements of the "dressed" sentence are all shown as vertical/slanted lines. Billroth very clearly intends the vertical lines to represent some kind of dependency, with multiple levels of modification being illustrated by subsequent vertical lines.

Exactly the same approach with the same picture is found in his extended grammar written two years later (Billroth 1834: 332-333). After Billroth's early death this grammar has seen various new editions. The second edition of 1838 is prepared by Friedrich Ellendt and uses exactly the same figure (Billroth 1838: 329). However, in the third edition, the picture is changed, erroneously, and has become completely incomprehensible, cf. Figure 2.12 (Billroth 1848: 358). Ellendt possibly did not completely understand what the figure is supposed to represent. [2.30]

Billroth's grammar has an interesting afterlife, but unfortunately without any further development of his graphical innovation. Friedrich Ellendt writes a different grammar for younger students based on Billroth's model, called *Lateinische Grammatik für die unteren Klassen der Gymnasien*. The discussion of *bekleidete oder erweiterte Sätze* is very similar to Billroth's, but it has different examples and it does not have a picture anymore (Ellendt [2.31]

1838: 115-116). After the death of Ellendt, that grammar is in turn adapted by Moritz Seyffert as *Dr. Friedrich Ellendt's Lateinische Grammatik für die unteren und mittleren Klassen der höheren Unterrichtsanstalten*. This grammar has seen very many revisions, editions and reprints under the heading *Ellendt-Seyfferts lateinische Grammatik* far into the 20th Century. However, Seyffert was not very impressed by the syntactical analysis of Billroth (as noted in the preface of his revision), and he revised the discussion of syntax wholesale.

[2.32] On a more positive note, Billroth's graphical display had a direct influence on Julius Hoffmann (see Section 2.8), but also that incarnation of graphical grammar did not catch on. One could speculate whether there is any influence from either Billroth or Hoffmann on the graphical analysis of Franz Kern (see Section 2.10), but there is little evidence for that.

2.6 Allgemeiner Mechanismus des Periodenbaues (Lehmann 1833)

[2.33] Johann August Otto Leopold Lehmann (1802-1883) worked as a teacher in Danzig (Gdańsk) and later as a school principal in Marienwerder (Kwidzyn). In this context, he prepared various educational textbooks, mainly consisting of literary commentaries, but also including songbooks, dialect analyses and some works on local history. Early in his career he wrote a linguistic treatise about the structure of the complex sentence: *Allgemeiner Mechanismus des Periodenbaues, nebst einem Versuche, an ihn eine Kritik der deutschen Periode anzuknüpfen* (Lehmann 1833). His approach to the analysis of complex sentences is based on the work of Herling (see Section 2.3), who is explicitly cited as a source of inspiration (Lehmann 1833: xv-xvi).

[2.34] In the title of his book, Lehmann uses the term *Periode*, which is a term also used by Herling. This term stems from the domain of rhetoric and roughly indicates a coherent and well-structured utterance. Continuing the tradition of Herling, Lehmann uses the term *Periode* to designate a complex sentence that consists of multiple clauses. Herling already introduced symbolic abbreviations for different kinds of clauses (see Section 2.3), but Lehmann takes this a step further and proposes a comprehensive visualization of the structure of a complex sentence, which he calls a *Periodenbild*.

[Die] innere Anschauung der Periode soll als auf äußere Anschauung begründet dargestellt werden. Die äußere Anschauung aber findet ihr Objekt in Bildern, welche das Skelet der Perioden wiedergeben. Ich nenne dies Periodenskelet ANSCHAUUNGSBILD DER PERIODE oder PERIODENBILD schlechtweg. (Lehmann 1833: xiv)

(“The internal structure of the *Periode* will be depicted based on the outward appearance. The outward appearance shows itself as a picture, which reflects the skeleton of the *Periode*. I simply call this *Periode*-skeleton an IMAGE OF THE PERIODE OR A PERIODE-PICTURE.)

[2.35] For the visualization of a *Periodenbild* Lehmann distinguishes three different kinds of subordination, indicated by different symbolic devices as shown in Figure 2.13 (Lehmann 1833: 58). These three notations basically indicate a subordinate position after (1), before (2) and internal (3) to the superordinate clause, respectively. More precisely,

- the first notation uses a horizontal brace, which indicates that the subordinate clause (below the brace) follows the superordinate clause (above the brace). This is called *Anfügung* or *Nachperiode*;

- the second notation uses a colon, which indicates that the subordinate clause (in front of the colon) is positioned before the main clause. This is called *Vordersatz*, *Vorderperiode* or *Vorausschickung*;
- the third notation uses round brackets, which indicates that the subordinate clause (inside the brackets) is positioned inside the superordinate clause. This is called an *Einschaltung*. The separated parts of the superordinate clause are indicated by repeating the same letter. Such repetitions of the same letter thus do not indicate multiple clauses, but separate parts of the same clause.

At first glance it seems curious that there are completely different notation for the placement in front (colon) and the placement behind (horizontal brace). However, there is clear rationale for this difference arising from the structural possibilities of the German language (although this rationale is not explained by Lehmann in his book). The German main clause has a special initial position (today mostly called *Vorfeld*) that can contain a single subordinate clause. So each main clause can only have a single *Vordersatz*, which Lehmann indicates with the colon. Internal and final subordination can be recursively repeated. [2.36]

Lehmann's book completely focusses on the analysis of complex sentences into their constituting clauses, using his graphical display to summarize the relationships between the clauses. There are hundreds of examples of different kinds of complex sentences discussed in his book, but there is not a single analysis of a clause-internal structure at all. He appears to be much more interested in the number of possible schemas that could exist, which are all *Umformungen* of a complex sentence. For example, he discusses an example of a particular schematic analysis (apparently without any real linguistic sentence in mind) that could theoretically have 37,632 *Umformungen* (Lehmann 1833: 116-118). Lehmann immediately notes "*Es wäre thöricht, bei dieser oder ähnlichen Perioden, die zu den Verwickeltsten gehören, all möglichen Veränderungen darzustellen.*" ('It would be foolish for such or similar *Perioden*, that belong to the most complex ones, to illustrate all possible changes.' Lehmann 1833: 116-118). [2.37]

Clauses are indicated by using letters, an approach that was also used by Herling (cf. Section 2.3). However, Lehmann has a completely different approach to the use of the letters. Lehmann is only interested in the relative ordering of the subordinated clauses and he completely ignores what kind of subordination is used. In contrast, Herling uses different letters for different grammatical kinds of subordinated clauses, for example *a* for adverbial clauses. When there are three adverbial clauses in a sentence, then they are all called *a* by Herling. The letters are thus indications of the grammatical kind of the clause. Lehmann instead uses a different letter for each subordinate clause, giving each clause an individual label, but omitting any indication of the internal structure. [2.38]

This difference between Herling and Lehmann also concerns the use of Greek letters. Herling uses greek letters for non-finite subordinate clauses (using *zu*-infinitive or participial verb forms in German), but Lehmann does not consider non-finite clauses at all. He uses greek letters for doubly-embedded subordinate clauses. In contrast, Herling uses numerical superscripts for multiple grades of embedding. Lehmann uses different kinds of scripts to distinguish multiple grades of embedding. He uses capital letters for main clauses, lower-case letters for subordinate clauses and greek letters for doubly-embedded clauses. Third-grade embedding uses Fraktur capital letters (e.g. ☉, ☉) and fourth-grade embedding uses Fraktur lower-case letter (e.g. ☉, ☉). There is even a short discussion of a fifth-grade embedding, which is indicated with numerals (Lehmann 1833: 232). [2.39]

In contrast to Herling, Lehmann's approach thus ignores many aspects of the grammatical analysis of a sentence. However, his focus on the relation between clauses allows him in return to tackle really complex sentences. Consider, for example, the long and complex [2.40]

sentence in (2.6), which is a sentence from Immanuel Kant's *Anthropologie in pragmatischer Hinsicht* (Lehmann 1833: 125-126). The internal structure of this sentence is summarized by Lehmann with a relatively simple *Periodenbild* as shown in Figure 2.14.

- (2.6) Daß ferner, wenn es (das Kind) nun zu sprechen versucht, das Radbrechen der Wörter es für Mütter und Ammen so liebenswürdig macht, es beständig zu herzen und zu küssen und es auch wohl durch Erfüllung alles Wunsches und Willens zum kleinen Befehlshaber zu verziehn: diese Liebenswürdigkeit des Geschöpfes im Zeitraum seiner Entwicklung zur Menschheit, muß wohl auf Rechnung seiner Unschuld und Offenheit aller seiner noch fehlerhaften Aeußerungen, wobei noch kein Hehl und nichts Arges ist, einerseits, anderseits aber auf den natürlichen Hang der Ammen zum Wohlthun an einem Geschöpf, welches einschmeichelnd sich der Willkür eines andern überläßt, geschrieben werden, da ihm eine Spielzeit eingewilligt wird, die glücklichste unter allen, wobei der Erzieher dadurch, daß er sich selber gleichsam zum Kinde macht, diese Annehmlichkeit nochmals genießt. (Lehmann 1833: 125-126, citing Immanuel Kant *Anthropologie in pragmatischer Hinsicht* 1798: 5)

[2.41] The different clauses in Figure 2.14 are listed below, exactly as it is explained in the text by Lehmann:

- **main clause A:** [clause α preceding] *diese Liebenswürdigkeit des Geschöpfes im Zeitraum seiner Entwicklung zur Menschheit, muß wohl auf Rechnung seiner Unschuld und Offenheit aller seiner noch fehlerhaften Aeußerungen* [clause β internal] *einerseits, anderseits aber auf den natürlichen Hang der Ammen zum Wohlthun an einem Geschöpf* [clause γ internal] *geschrieben werden* [clause δ following]
- **subordinate clause α , preceding A:** *daß ferner* [clause α internal] *das Radbrechen der Wörter es für Mütter und Ammen so liebenswürdig macht es beständig zu herzen und zu küssen und Willens zum kleinen Befehlshaber zu verziehn*
- **subordinate clause β , internal to A:** *wobei noch kein Hehl und nichts Arges ist*
- **subordinate clause γ , internal to A:** *welches einschmeichelnd sich der Willkür eines andern überläßt*
- **subordinate clause δ , following A:** *da ihm eine Spielzeit eingewilligt wird, die glücklichste unter allen* [clause β following]
- **secondary subordinate clause α , internal to α :** *wenn es (das Kind) nun zu sprechen versucht*
- **secondary subordinate clause β , following δ :** *wobei der Erzieher dadurch* [clause δ internal] *diese Annehmlichkeit nochmals genießt*
- **tertiary subordinate clause δ , internal to β :** *daß er sich selber gleichsam zum Kinde macht*

[2.42] Although Lehmann's book does not appear to have been reprinted after the first edition from 1833, it has influences later more widely read works by Götzinger (see Section 2.7) and Bauer (see Section 2.9), whose graphical displays will be reprinted up to 1935. Götzinger's acknowledgement indicates that Lehmann's approach might have had some real influence in didactic circles, although it has not endured to the present day:

Die von Herrn Director Lehmann in Marienwerden zuerst aufgestellten Periodenbilder haben bei vielen Schülern Beifall und Anwendung gefunden, und es macht mir große Freude, durch meine Lehrbücher zur Verbreitung dieser Methode, deren Verdienst ganz allein Herrn Lehmann gebührt, beigetragen zu haben.
(Götzinger 1842: x, Vorrede zur fünften Auflage)

(‘The *Periodenbilder*, first drawn by director Lehmann from Marienwerder, have been praised and employed by many Schoolmen, and I am delighted through my textbooks to have contributed to the wider circulation of this method, the credit to which completely befits Mr. Lehmann.’)

2.7 *Die deutsche Sprache* (Götzinger 1836)

Maximilian Wilhelm Götzinger (1799–1856) was a teacher of German, most of his life working in Schaffhausen (Switzerland). He wrote extensively about grammar, literature and dialectology, see Olsson (2009) for an comprehensive appraisal of his work. Besides his didactic writings, Götzinger also provided material for Grimm’s dictionary project (Olsson 2009: 37) and he was even awarded a doctorate *honoris causa* from the University of Basel in 1838 (Olsson 2009: 36), probably through his personal contact with Wilhelm Wackernagel (the father of Jacob Wackernagel of *Wackernagel’s law*-fame).

Götzinger wrote two didactic grammatical textbooks, both of which appeared in many different editions throughout the 19th Century (see Olsson 2009: 42–46 for a list of all editions). The book *Die Anfangsgründe der deutschen Sprachlehre in Regeln und Aufgaben* was first published in Leipzig in 1825. This was followed in quick succession by the *Deutsche Sprachlehre für Schulen*, first published in 1827 in Aarau. Originally, both these books did not contain any graphical analyses of sentences. A few years later, when revising his didactic grammars once again, he included graphical displays as discussed below, both in the fifth edition of the *Deutsche Sprachlehre* (Götzinger 1842: 222–226, 287–291) and in the fifth edition of the *Anfangsgründe* (Götzinger 1845: 236–242).

There is a curious graphic in the first edition of the *Deutsche Sprachlehre für Schulen* (Götzinger 1827: 263), reproduced here in Figure 2.15. This graphical display purports to show different ways in which clauses can be coordinated to form a *Periode*. Although he lists various literary examples of such structures (Götzinger 1827: 264), it remains unclear how exactly this analysis is supposed to work. From the graphic it appears as if there should always be a central pair of clauses, but there is no explanation how to extract this central pair. The examples in the text seem to illustrate coordinated structures with a single central clause. For example, (2.7) illustrates the option *Viergliedrig c*, but this one clearly has the principal clause at the end.

- (2.7) Wo göttliche Kraft und Empfindung die Gedanken belebt; wo Dank und Bitte auf den Flügeln des Wortes zum Himmel steigt; wo ein heiliger Ort den umherschweifenden Sinn feßelt und fammelt – da ist Religion.

A decade after the first editions of his textbooks Götzinger writes his magnum opus *Die deutsche Sprache und ihre Literatur* (volume one 1836; volume two 1839). This book includes various graphical analyses, which are clearly inspired by the *Periodenbilder* from Lehmann (see Section 2.6). Götzinger does not explicitly cite Lehmann as his inspiration for the graphical display, but he mentions Lehmann’s *vortreffliches Buch* (‘excellent book’) in a different context (Götzinger 1839: 217). In a later preface to a different book he explicitly explains how he adapted and extended Lehmann’s display (Götzinger 1842: vi).

Summarising, Lehmann (see Section 2.6) used a capital letter for a main clause and lower-case letters for subordinate clauses. Depending on position, there are three different methods to depict subordination. First, a subordinate clause in front of the main clause is separated by a colon. Second, a subordinate clause after the main clause is written below the main clause with a horizontal brace. Third, a clause-internal subordinate clause is written in round brackets.

[2.48] Lehmann used his graphical method only for subordinated clauses, but Götzinger argues that the same idea of subordination (*Unterordnung*) can be used for other kinds of linguistic structure as well. Consequently, Götzinger uses Lehmann's notation also for (i) syllabic structure, (ii) clause-internal structure and (iii) clause subordination.

Auf diese Weise ordnet die Sprache bei allen Vorgängen den jedesmaligen Stoff so, daß ein Theil desselben als untergeordnet erscheint, in der Silbe die Laute, im Worte die Silben, im Satze die Worte, in der Periode die Sätze. (Götzinger 1836: 15)

('Accordingly, language arranges the particular content in all occurrences in such a way that one part of it appears as subordinated: with syllables the sounds, with words the syllables, with clauses the words, with sentences the clauses.')

[2.49] First, for the analysis of the syllable, Götzinger (1836: 221-224) uses the capital letter for the vowel as the centre of the syllable (*Träger und Mittelpunkt der Silbe*) and lower-case letters for the consonants as dependent on the vowel (*erscheint stets als untergeordnet*). As long as the syllabic structure is according to the sonority hierarchy (*musikalisches Gesetz*), it can be described as (multiple) prefixal and suffixal subordinations, as illustrated in Figure 2.16. Extrasyllabic initial *s* and affricate codas *ps*, *tsch* and *chs* are illustrated with different structures not repeated here (Götzinger 1836: 224).

In der Regel findet bei der Gliederung der Silbe durch fortschreitende Unterordnung der Elemente ein Schwellen und Sinken, ein Steigen und Fallen, ein Crescendo und Decrescendo statt; d.h. die Silbe fängt mit dem lautlosesten Element an, geht zu dem tönenenden über, gelangt zur eigentlichen Stimme, und geht nun denselben Weg wieder abwärts, so daß mithin in jeder auf diese Weise gebaute Silbe ein völlig musikalisisches Gesetz statt findet. (Götzinger 1836: 222)

('Normally, the arrangement of the syllable consists, by repeated subordination of the elements, of swelling and sinking, of rising and falling, of crescendo and decrescendo; i.e. the syllable starts with the most silent element, proceeds to the more sounding one, reaches the principal voice, and then follows the same path downwards again in such a way that each such constructed syllable obeys a completely musical law.')

[2.50] Second, for the analysis of the internal structure of a clause, Götzinger proposes to use the same notation (Götzinger 1839: 159-162). A few examples are shown in Figure 2.17. The capital letter now refers to the verb and the lower-case letters refer to the constituents. Götzinger calls the lower-cased elements *Bekleidung* (cf. the discussion in Section 2.5). Today a German grammar would call them *Satzglied*. The German main clause structure with two verb positions is indicated by a repeated capital letter, called *trennbare Zusammensetzung* by Götzinger (1839: 160). Similar terminology can still be found in contemporaneous German grammars.

[2.51] Relative to the main verb, the three possible positions of the *Bekleidung* (i.e. before, in between and after the verb) are called *Voraussendung*, *Anfügung*, *Einschiebung*, respectively (Götzinger 1839: 160). They are indicated with a colon, a horizontal brace and round brackets in the tradition of Lehmann (see Section 2.6), who calls them *Vorausschickung*, *Anfügung* and *Einschaltung*. Today a German grammar would say *Vorfeld*, *Nachfeld* and *Mittelfeld*. Götzinger also observes one of the main generalisations of German main clause structure, namely that the *Voraussendung/Vorfeld* never consists of more than one *Bekleidung/Satzglied*.

Mag also die Stellung der Bekleidung in jenem Satze seyn, wie sie will, immer wird nur das Bild entstehen [mit einer Voraussendung]. Niemals kann die Folge vorkommen [mit mehreren Voraussendungen]. (Götzinger 1839: 162)

(‘Although the position of the constituents in the sentence can be as it chooses, the resulting image will always have a single *Vorraussendung*. The ordering with multiple *Voraussendungen* cannot occur.’)

Third, for the analysis of the multi-clause sentence (*Periode*)

[2.52]

subordination: 364-367, 371, Periode: 374-403

[2.53]

coordination (*Beiordnung*) with an equal sign (p.366) He observes, that with multiple subordinate clauses there are examples that appear to have an empty second part of the main predicate, or, in modern terminology, an empty *rechte Satzklammer*. He uses a dash to indicate such zeros. (p.381)

[2.54]

2.8 *Neuhochdeutsche Schulgrammatik* (Hoffmann 1839)

Karl August Julius Hoffmann (1812-1869)

[2.55]

“Unter den Grammatiken der fremden Sprachen verdanke ich der Lateinischen von Billroth am meisten.” (p. xiii)

[2.56]

nackter und umkleideter Satz 146-148

[2.57]

complex sentence p. 224

[2.58]

second edition (Hoffmann 1853), basic example the same, on p. 137

[2.59]

extended complex sentence on page 216-217

[2.60]

new: discussion of *Periode* p. 240: (use of letters like Lehmann)

[2.61]

Von Perioden kann man Bilder entwerfen, indem man die Hauptsätze mit A B C, die Nebensätze ersten Grades mit a b c, die Nebensätze zweiten Grades mit α β γ , die Nebensätze dritten Grades mit δ ϵ ζ bezeichnet. So ist z.B. das Schema der eben unter Nr. 5 aufgeföhrten Periode folgendes: [A a α A b β : B c.]

- (2.8) Es ist für denjenigen, der mit sich selbst noch nicht recht eins geworden ist, was er denn eigentlich suche und wolle, äußerst beängstigend, wenn er auf seinem Wege auf Sätze stößt, die allen seinen bisherigen Meinungen und den Meinungen seiner Zeitgenossen und der Vorwelt widersprechen: und gewiß ist diese Ängstlichkeit eine der Hauptursachen, warum die Menschheit auf dem Wege zur Wahrheit so langsame Forstschrifte gemacht hat. (Hoffmann 1853: 239, citing Fichte)

Neuhochdeutsche Elementargrammatik mit Rücksicht auf die Grundsätze der historischen Grammatik

[2.62]

6. Auflage 1865 <https://www.digitale-sammlungen.de/view/bsb10583851?page=5>
images: <https://www.digitale-sammlungen.de/view/bsb10583851?page=194>

Kern cites Hoffmann (Kern 1888), but only in the second edition after he already published his “tree” metaphors. The idea for the “trees” is already in “Satzlehre”, finished in December 1882, and practically applied in “Methodik” of 1883.

[2.63]

2.9 Neuhochdeutsche Grammatik (Bauer 1850)

[2.64] Friedrich Bauer (1812-1874) studied theology and was the founding director of a missionary education centre in the Bavarian city of Neuendettelsau. This institute is still active today as *Mission EineWelt*. Among other duties, Bauer also taught religion and German grammar at his institute (Fuchshuber-Weiß 2013: 93). In that context he wrote the *Grundzüge der neuhochdeutschen Grammatik für die unteren und mittleren Klassen höherer Bildungsanstalten*, which was first published in 1850. Bauer himself delivered various editions of this book up to his death in 1874.

[2.65] After Bauer's death, the German dictionary maker Konrad Duden kept producing new editions of this grammar with only very minor changes. The *Neuhochdeutsche Grammatik* remained popular and has seen at least 27 editions, the last one from 1912 (Fuchshuber-Weiß 2013: 115-117). However, that was not the end, as Bauer's text was given a second life. After the death of Duden in 1911, Duden's dictionary lived on and became a household name in Germany for everything related to the German language. In 1935, under the auspice of Otto Basler, the 11th Edition of the Duden dictionary was expanded with a German grammar (Basler 1935), which was basically a new edition of Bauer's *Neuhochdeutsche Grammatik* (without clear attribution to Bauer). Only after the Second World War was the grammar completely rewritten and new editions of that new Duden grammar are still popular today. The graphical display is gone in this rewritten Duden grammar.

[2.66] (Bauer knew Hoffmann's grammar, (Fuchshuber-Weiß 2013: 99))

[2.67] In the grammatical analysis of complex sentences, Bauer (1850: 94-97) uses a graphical display in the tradition of Lehmann (see Section 2.6), although he does not explicitly cite him (Maybe Bauer got it from Götzinger?). The first similarity is that Bauer's analysis only deals with the relation between main and subordinate clauses, not clause-internal structure. Second, and most telling, Bauer follows Lehmann's convention to use capital letters for main sentences and lower-case letters for subordinate sentences. And finally, after a few pages of examples, Bauer comments, almost as an afterthought, that this analysis is called PERIODE, a clear implicit reference to Lehmann (and his inspiration, Herling (1823)).

Die künstmäßige Gliederung mehrerer Sätze in beigeordneter oder untergeordneter Verbindung zu einem ganzen heißt man Periode ('The artful arrangement of multiple sentences in coordinate or subordinate juncture into a whole is called *Periode*', Bauer 1850: 97, translation MC).

[2.68] The first few basic examples of Bauer's syntactic analysis are shown in Figure 2.18 (Bauer 1850: 95). These examples are also found in exactly the same layout 85 years later in Basler (1935: 254). Each sentence is analyzed in two ways: the text itself is subdivided into clauses, with subordinate clauses shifted down vertically and connected with lines (is this inspired by Hoffmann?). Additionally, there are structural analyses in the form of letters, with capital letters for main clauses and lower-case letters for subordinate clauses. First-level subordination is separated by a comma, while secondary or deeper subordination is indicated by vertical lines (and sometimes numerical superscripts). The vertical arrangement is clearly borrowed from Lehmann (although Bauer leaves out the horizontal brace from Lehmann), but the superscripts indicate that Bauer also took notice of Herling's notation (cf. Section 2.3).

[2.69] This analysis is rather similar to a constituency analysis with the abstract letters indicating the node labels and the clauses being the leaves. Specifically, subordination is not linked to an explicit superordinate word (i.e. to a head as in a dependency analysis), but to a superordinate abstract entity.

A more complex example discussed by Bauer is the sentence (2.9), analyzed as Figure 2.19 [2.70] (Bauer 1850: 97). Again, there is both an analysis of all main and subordinate clauses, written out with subordination marked by vertical lines, and there is a structural pattern with letters and symbols in the bottom right. This structural pattern has two cases of coordination (marked by a plus symbol), an internal subordination (marked by the brackets), a secondary subordination (marked by a vertical line) and a subordination at the end of the sentence (marked by a comma). I have attempted to combine both these analysis into a single constituency tree as shown in Figure 2.20. The structural pattern has been used as the node-labels, while the text itself are the leaves in the tree. Probably it would have been more accurate to analyze the subordination *c* as a simple frontal embedding of the second conjunct, using a comma in the analysis instead of brackets for a clause-internal embedding (viz. *A+c,A,a+a* instead of *A+A(c)A,a+a*), but that is some minor nitpicking.

- (2.9) Er schenkte ihr 300 Rubel und als er erfuhr, daß sie in Petersburg einen Vetter habe, stellte er ihre frei, ob sie ihre Reise fortsetzen oder ob sie umkehren wolle. (Bauer 1850: 97)

2.10 *Methodik des deutsche Unterrichts* (Kern 1883)

Franz Kern (1830-1894)

[2.71]

Influence from Götzinger? (Forsgren 1998: 63) only circumstantial evidence

[2.72]

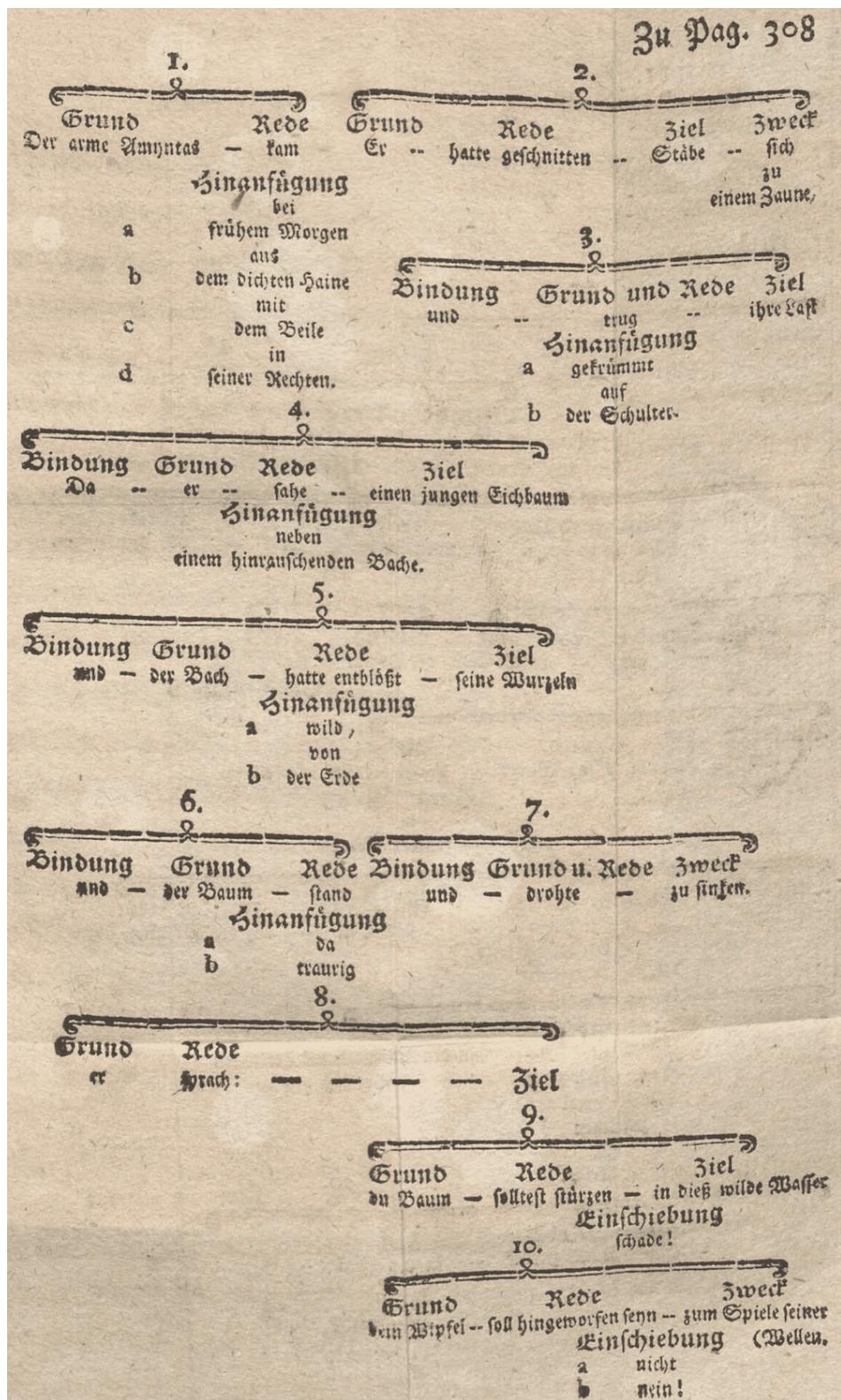


Figure 2.1: First page insert in *Deutsche Sprachlehre* (Moritz 1782: 308). Individual clauses are marked by a numbered bracket. Note the graphically lowered adjuncts (*Hinanfügung*) and the subordinated direct speech clauses (clause 9 and 10).

	II.	
	2	
Grund Rede Ziel Er -- nahm -- die schweren Stäbe. Hinansfüigung a jetzt, von b der Schulter.		
	12.	
Grund Rede Ziel Er -- sprach: -	13.	
	3	
Grund Rede Ziel Ziel ich -- kann hohlen -- andre Stäbe -- mir;		
	14.	
Bindung Grund und Rede erstes Ziel zweites Ziel und -- hub an zu bauen -- einen starken Damm -- vor den Baum,		
	15.	
Bindung Grund u. Rede Ziel Grund Rede und -- grub -- frische Erde. der Damm -- war gebaut	16	
	4	
	17.	Hinansfüigung
Bindung Grund und Rede Ziel und -- die entblößten Wurzeln -- waren bedeckt		jetzt,
	5	
Hinansfüigung mit frischer Erde:	18.	
	6	
Bindung Grund Rede erstes Ziel zweites Ziel und -- er nahm -- sein Beil -- auf die Schulter.		
	19.	Hinansfüigung jetzt
	7	
Bindung Grund und Rede Ziel und -- lächelte -- in den Schatten des geretteten		
	8	
Hinansfüigung Baumes hitt a noch einmal		
	9	
b zufrieden mit seiner Arbeit	20.	
	10	
Bindung Rede Ziel und -- wollte zurück -- in den Hain -- Zweck 21.		
	11	
Bindung Grund u. Rede Ziel um -- zu hohlen -- andre Stäbe.		

Figure 2.2: Second page insert in *Deutsche Sprachlehre* (Moritz 1782: 308). Note another example of a subordinated direct speech (clause 13) and a subordinated adverbial *um zu+Infinitiv* clause (clause 21).

Grund und Rede **Ziel** **Zweck**
 so fühle ich, — daß mir dieses genug ist, — um vergnügt
Hinanfügung **und glücklich zu seyn.**
 wenn
ich meine Pflicht thue,

Figure 2.3: Complex sentence with syntactic functions assigned to subordinate clauses from *Deutsche Sprachlehre* (Moritz 1782: 299).

1. 2.
Grund **Rede** **Ziel** **Grund** **Rede**
 ich — thue — meine Pflicht, ich --- fühle

 3. 4.
Grund **Rede** **Zweck** **Grund** **Rede**
 dieses --- ist genug --- mir, ich --- bin glücklich.

Figure 2.4: Separate analyses of the subordinate clauses of the complex sentence in (2.1) from *Deutsche Sprachlehre* (Moritz 1782: 300).

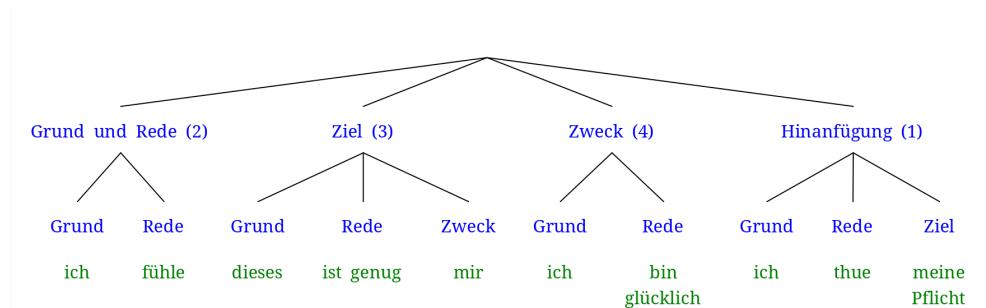


Figure 2.5: Constituency tree of the example in (2.1) following the analysis from Moritz (Moritz 1782: 299-300). Note the fixed ordering of the functional categories in each clause, making this a kind of “underlying” structure. The bracketed numbers indicate the ordering in the actual example.

Zur kürzeren Bezeichnung der Sätze und ihrer syntactischen Verhältnisse mögen folgende Zeichen dienen: h heiße: gramm. Hauptatz; b Adjektivatz, β , wenn er verkürzt ist; a, Adverbialatz, α , derselbe verkürzt; s, Substantivatz, σ derselbe verkürzt. Die Exponenten z. B. a^2 bedeuten die Grade der grammatischen, an h z. B. h^2 die Grade der logischen Abstufung: $\frac{1}{2}$, $\frac{1}{3}$, daß der Hauptatz, oder $\frac{2}{2}$, $\frac{3}{3}$ daß der Adverbialatz in zwei oder drei Theile zerschnitten ist. Die Coefficienten z. B. $2h$, bezeichnen die Zahl der gleichgeltenden Hauptsätze; bei a, b, s ihre Hinweisung auf die Hauptsätze, oft ihre Bevorde-
nungen.

Figure 2.6: Notation of Herling (1832) for the analysis of subordinate clauses in complex sentence structure. The different letters have a grammatical meaning, with *h* for main clauses, *b* for relative clauses, *a* for adverbial clauses and *s* for nominal clauses. Superscript numbers are used for the depth of the embedding.

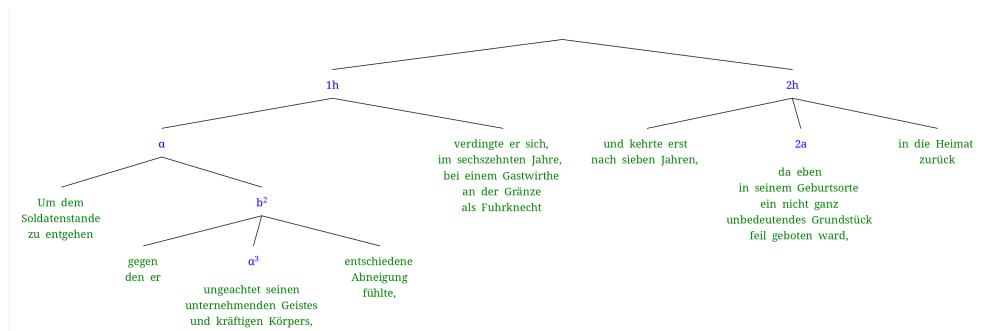


Figure 2.7: Constituency tree illustrating Herling's analysis (Herling 1832: 233) of the example in (2.2) using a modern visualization. Crucially, the clauses are linked to each other without attaching them to any specific words as would be the case in a dependency structure.

	Wortform.	Grammatische Bedeutung.
1 Wallenstein	Substant. N.	Subjekt des Hauptsatzes.
2 wußte	Verb. Imperf.	Prädikat zu 1.
3 längst	Adverb	der Zeit zu 2.
4 den Inhalt	Substant. A.	Gethane (Gewußtes) zu 2.
5 ihrer Sendung,	Substant. G.	Attributiv zu 4.
6 als	Konjunktion	des Adverbialsatzes im Verhältnisse der Zeit zu 2.
7 die Abgesandten	Substant. N.	Subjekt des Adverbialsatzes.
8 des Kaisers	Substant. G.	Attributiv zu 7.
9 ihm	Personalpron. D.	Personliches Objekt zu 10, 11.
10 vor die Augen	Subst. mit Präp.	Ortsverhältniß zu 11.
11 traten.	Verb. Imperf.	Prädikat zu 7.

Figure 2.8: Tabular analysis of the complete sentence (2.3), from the introduction of Becker (1829: xvii).

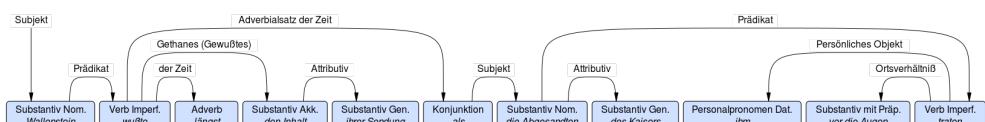


Figure 2.9: Graphical display of the CoNLL-U format based on Figure 2.8. Display is generated at <https://urd2.let.rug.nl/~kleiweg/conllu/>

I. Hauptsatz.	
1. Jakob	Subjekt.
2. schickte	Prädikat zu 1.
3. seinen	Attribut zu 5.
4. jüngsten	Attribut zu 5.
5. Sohn	Leidendes Objekt zu 2.
6. nicht	Aussageweise zu 2. (Leitf. §. 41).
7. mit den übrigen	Bestimm. Objekt. Gesellschaft zu 2.
8. nach Aegypten,	Bestimmendes Objekt. Ort zu 2.
II. Bestimmungssatz des Grundes zu 2 in I.	
1. weil	
2. schon einmal	Zeit zu 4.
3. ein Sohn,	Subjekt.
III. Eigenschaftssatz zu 3 in II	
1. den	Leidendes Objekt zu 3.
2. er	Subjekt.
3. ausgesandt hatte, Prädikat zu 2.	
Zu II.	
4. nicht zurückgekehrt war, Prädikat zu 3 in II.	
IV. Bestimmungssatz des Grundes zu 2 in I.	
1. und weil	
2. er	Subjekt.
3. fürchtete,	Prädikat zu 2.
V. Dingsatz. Leidendes Objekt zu 3 in IV.	
1. daß	
2. auch diesem	Ergänz. Objekt. Personens. zu 4.
3. ein Unfall	Subjekt.
4. begegnen möchte. Prädikat zu 3.	

Figure 2.10: Tabular analysis of complex sentence (2.4) with various subordinate clauses, from Becker (1833: 43).

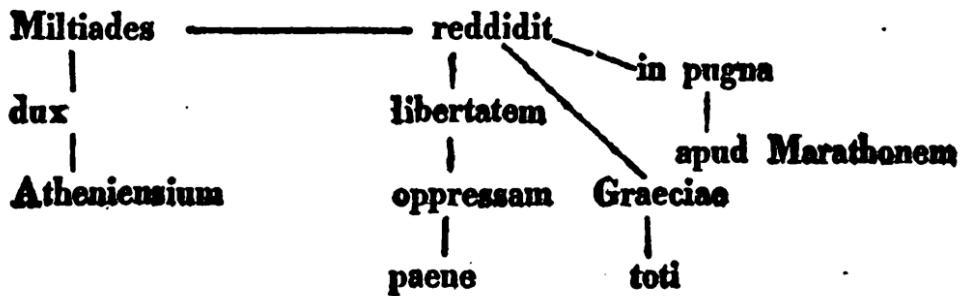


Figure 2.11: Graphical sentence analysis of (2.5) from Billroth (1832: 102).

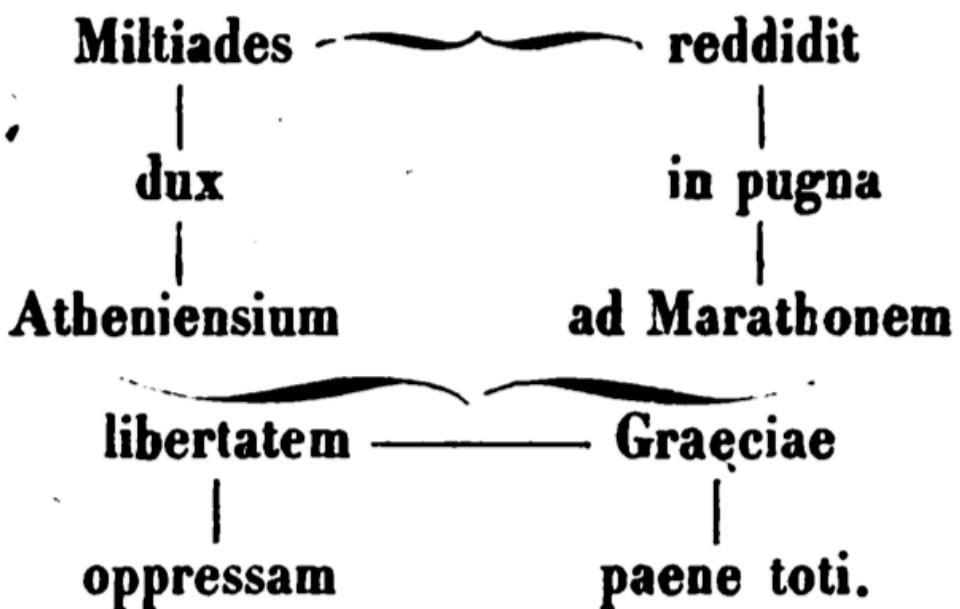


Figure 2.12: Revision from 1848

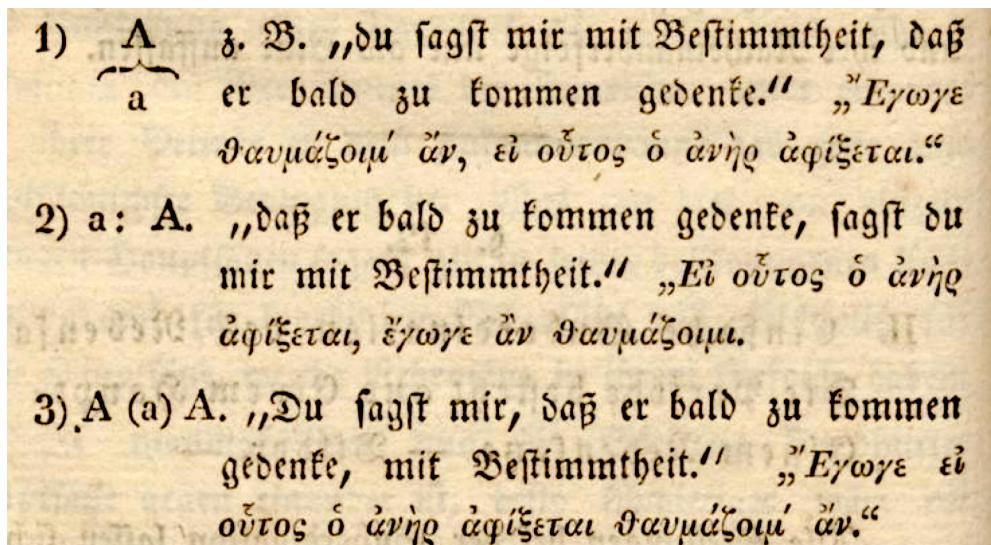


Figure 2.13: Three basic structural mechanisms of subordination from Lehmann (1833: 58). The first (with a horizontal brace) indicated that the subordination follows the main clause; the second (with a colon) indicates that the subordination precedes the main clause; and the third (with round brackets) indicated that the subordination is positioned internal to the main clause.

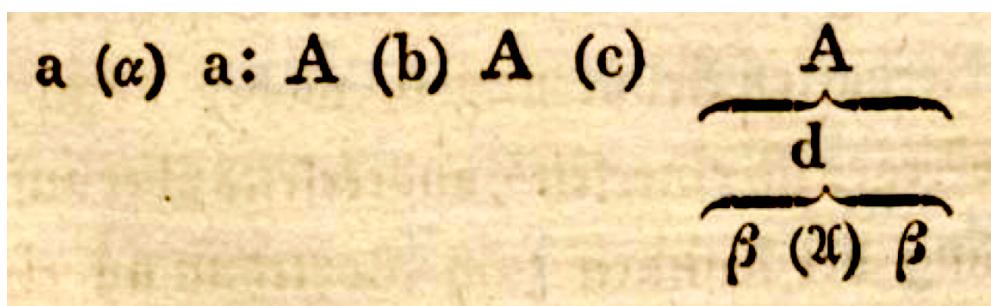


Figure 2.14: Lehmann's (1833: 126) analysis of Kant's sentence (2.6). The main clause is designated with a capital letter **A**, which is interrupted twice by subordinated clauses designated by lower-case letters, **b** and **c**. A further subordinated clause **a** comes before the main clause, and is itself interrupted by a second-order subordination designated by greek letter α . After the main clause there is yet another subordinated clause **d**, which is followed by a secondary embedding β , which is interrupted by a tertiary embedding indicated by a Fraktur capital letter Ξ .

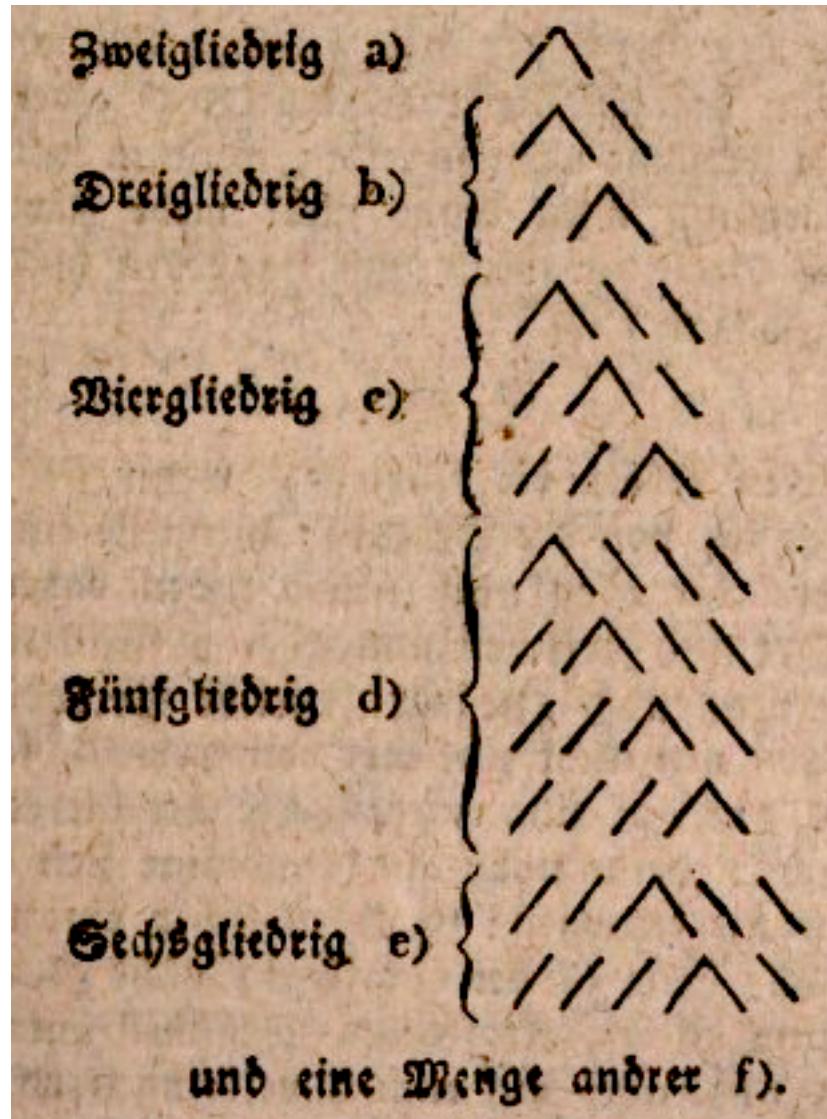


Figure 2.15: Götzinger's early attempt to list different kinds of clause coordination inside a *Periode* (Götzinger 1827: 263). The examples in the text make clear that these graphical displays are intended for coordinated structures, but it remains unclear how the graphically indicated central pair should be interpreted.

bald	: a : B	
		<u><u>c</u></u>
fürcht		d
zunft	{ : a : B	
folgt	{	<u><u>c</u></u>
		<u><u>d</u></u>
		<u><u>c</u></u>
brei	: a : b : C	
brauch	: a : b : C	
		<u><u>d</u></u>
brand	{ : a : b : C	
brecht	{	<u><u>d</u></u>
		<u><u>e</u></u>

Figure 2.16: Syllables with a structure in accordance to the sonority hierarchy (Götzinger 1836: 223) have a vowel as nucleus (capital letter) and possibly multiple ‘subordinate’ consonants in the onset (lower-case letters separated horizontally with colons) and the coda (lower-case letters separated vertically with braces).

Das Alter schleicht dem Menschen nach auf dem Fuß. — a: B (b) B
c
 Man muß dem Alter seine Weise lassen. — A (b, c) A
 Es lockt Musik aus salz'gem Hause zu frohen Sprüngen A
 den Delphin.
b, c, d, e
 Auf dem Strome der Zeit fließen die Welt- a: B (c, d, *e, f) B
 begebenheiten aus der Zukunft durch
 die Gegenwart in die Vergangenheit
 hinüber.
 Nach langem vergeblichen Suchen entdeckten die Schweden a: B
 den königlichen Leichnam unfern dem großen Steine. c, d, e

Figure 2.17: Main clause analysis from Götzinger (1839: 161) using the same notation as for syllables. In modern grammatical terminology: the main verb is indicated by the capital letter, possibly two times in case of a separated verb. Other *Satzglieder* are indicated by lower-case letters. The *Vorfeld* is separated by a colon. The *Mittelfeld* is put between round brackets, with multiple constituents separated by commas. The *Nachfeld* is indicated below the horizontal brace, again with commas separating multiple constituents.

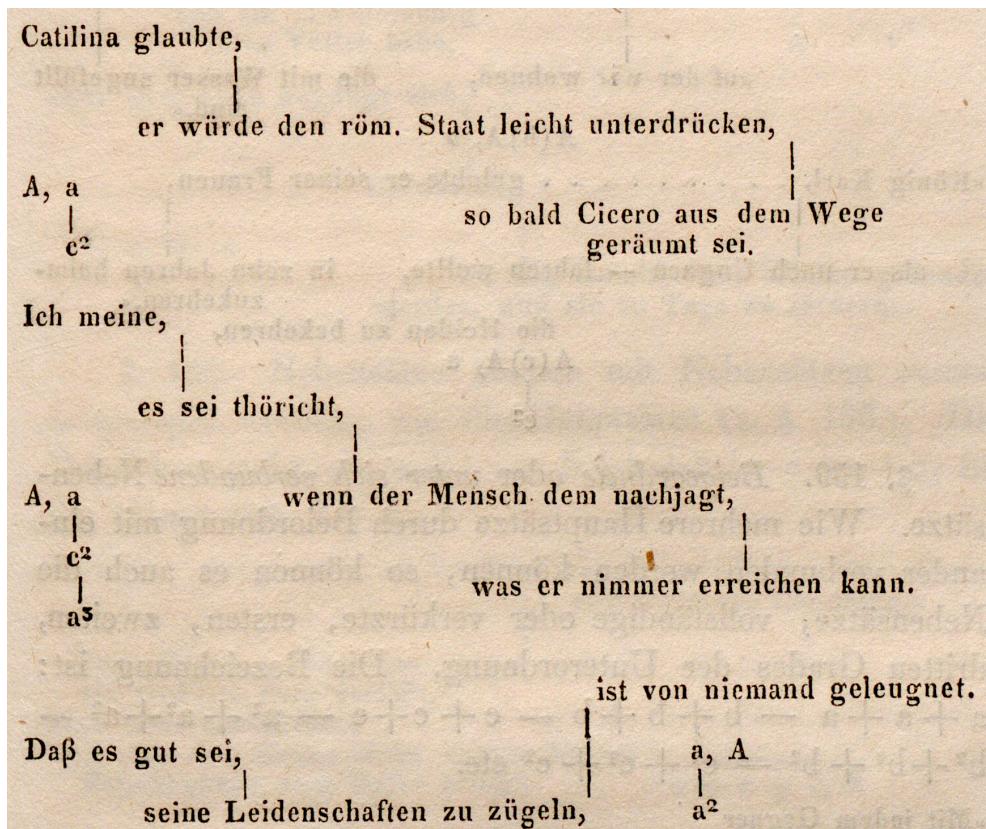


Figure 2.18: Basic examples of Bauer's sentence analysis (Bauer 1850: 95). There are three sentences analyzed in this excerpt, with subordination structure indicated by vertical lines and the structural patterns to the side, summarized with letters.

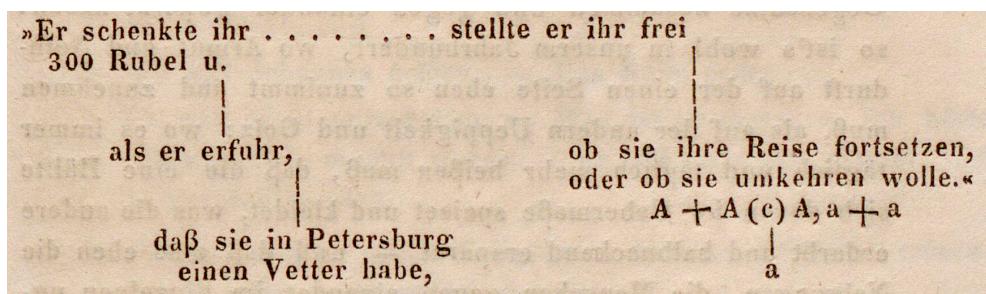


Figure 2.19: Analysis of the complex example in (2.9) from Bauer (1850: 97). Note both the use of vertical lines for subordination and the separate abstract analysis with symbols in the bottom right.

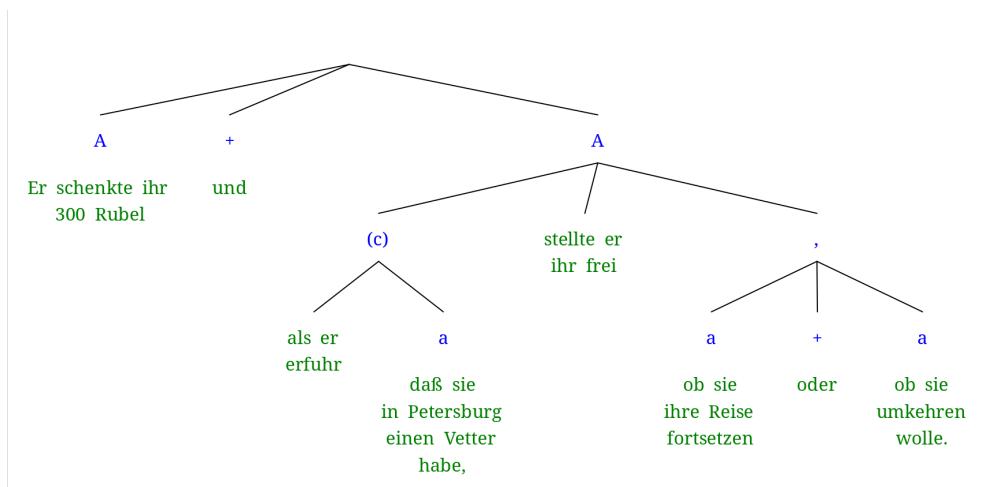


Figure 2.20: Display of the structure combining the text from example (2.9) and the structural letter-analysis from Figure 2.19 into a contemporary-style constituency tree.

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