Preliminary Remarks

1. What is a learner?

The topic of the present staging lesson is our language, i.e. the natural spoken language as we use it every day. In Lehrkunst didactics we also use technical terms which may not be familiar even to experienced teachers. Two of them are the word “Lehrstück” or the term “learner”. Although pupil and student are the common terms in English we prefer to use the term learner since Lehrkunst didactics don’t want to restrict learning to schools. Everybody is a learner all the time. That’s our conviction!

2. What is a staging lesson (“Lehrstück”)?

Staging lessons are first of all didactic proposals how a certain learning material can be taught at school or elsewhere. The choice of the learning contents, the forms of their presentation and the history of their staging at schools are well justified, often documented and always open to further development. Staging lessons are medium length teaching units that are self-contained, multi-dimensional or interdisciplinary and equally open to experience, to discoveries and to action. They are composed according to Martin Wagenschein’s methodological triad of "Exemplary - Genetic - Dramaturgical".

3. The teaching idea or instructional idea: to activate our speech feeling, in order to get to know the language genesis and our creativity

Each tuition is characterized by a teaching idea, which is already expressed in the choice of material, but then in the didactical presentation of the learning contents. For each staging lesson, therefore, there is a separate teaching idea, that is, a distinctive methodological grasp, which is triggered by the appearance of the teaching object and which then also influences the composition. In the staging lesson "Universal grammar with Chomsky", the teaching object is the natural human language, which we daily encounter in the form of segmented sound strings, the expression of which serves the communication among human beings. As long as this communication by means of sounds is working, we do not have to worry about the (rules of its) genesis, that is, the grammar. But as soon as misunderstandings threaten, we immediately fall back on our language intuition or our intrinsic grammar in order to clarify the meaning of the utterance and to ask our partner again where

possible. The teaching idea in this grammar staging lesson now consists in using our language intuition as a source of knowledge, or consciously activating our speech feeling, in order to discover the genesis of language and learning through language as the core of our creativity.

4. The composition

"The form of the teaching plays is strict, but only so that parts of one's own invention and of current kind can be inserted more easily." This sentence was written by Bertolt Brecht in his "Theory of the Teaching Play" with regard to his own (theatre) plays. He wanted to enable and facilitate the production of his plays in other places and under other conditions. This dialectics of form rigidity and freedom of variation also applies to the staging lessons at school, which were developed by the “Lehrkunst” didactics following Martin Wagenschein. In order to promote the transferability to different schools, school levels and learning groups, we use to note the "strict" form of the staging lesson as a composition, which then allows us to point out possible variations, extensions and connecting fields as well as the "essentials". Like Brecht, we also use other theatrical concepts such as dramaturgy (for the arc of suspense), acts, and sometimes scenes for the single arcs or staging for playing a piece on our (always present) school room stage.

The composition in the tabular overview

With this teaching idea as a guide you can think of quite different beginnings and sequence scenarios for a staging lesson. Many attempts for plays on words, which work with a breach of the rules, lead to the activation of our intuition. In “Lehrkunst” didactics, however, we claim to connect to the state of the sciences in the different learning areas and to reenact the great scientific discoveries and breakthroughs. For this reason, we choose the linguistic researches of Noam Chomsky, who in the twentieth century has revolutionized the linguistic sciences and played a decisive role in recent neurological research. A playable lessons unit of medium length on Chomsky's research path looks as follows in the tabular overview:

The Composition in a Synopsis

Disposition	Contents	Didactical Forms
Prelude	Farewell to a non understood grammar Encouragement test: I master my mother tongue intuitively	• Short survey test with a few latinized grammar terms • A dozen of proofs that we have all the competences that a grammar according to Chomsky should be able to explain, first of all our creativity to form any number of different new sentences
First Act	Discovering the Sentence (as the first Universal)	• Socratic debate on the primal scene of universal grammar (Chomsky picture with nonsense sentence) • Radicalizing the nonsense sentence in order to expulse semantics • Determining the sentence boundaries with foreign language text for the discovery of the sentence as a formal universal • Letter changeover play to discover the sentence as a part of an operational set
Second Act	Discovering the threefold language genesis and the generative principle in the formation of language Leading Question: How do we attain language?	• Socratic debate on the discovery of the actual genesis, of the ontogenesis and the phylogenesis of language • Ontogenetic approaches with exercises for fitting in our specific phonetic language set • Looking at our language acquisition as children: the Münchhausen Paradox • Phylogenetic theories concerning the motherese
Third Act	Expanding the generative syntax of sentences	• Socratic debate to solve Chomsky‘s task in the 1960s (construction of a translation machine) • The tree metaphor (derivation and representation of the current syntax categories in the tree structure) at least up to the recursivity (self embedding of NP, VP and S), the mathematical form of creativity • Classifying the conventional grammar terms in the new system (eg. subject for nominal phrase)
Finale	Looking back at our path of learning in the staging lesson and assembling our personal portfolio	• Overview of our learning path in the staging lesson • Answering open questions for ourselves • Collecting all materials in our portfolios

The prelude: Farewell to a closed book with an encouragement test

Survey: ***How much do you like grammar?***
Who can define the following terms?

Each student has a number of subject-related terms for describing language: names for classes of words, parts of words, parts of sentences, partial sentences, complete sentences, etc. Most of these terms are derived from Latin and are used as functional terms, also in foreign languages, for example adverbum as a positional description: a word added to another word. But whoever does not translate these foreign words (back) and clarify their functional meaning in the overall context, operates with empty terms and loses itself very quickly in the mop of the abundance of technical terms, which often still sound very similar (adverb and adverbial, conjunction and subjunctive etc.). The result is often a bad conscience with the pupils for not having swotted enough, or else they resign from that part of the "grammar", which appears like a closed book to them.

In the prelude, a brief survey will address this issue of non-comprehension, not to embarrass someone, but to show that in fact all of us are affected. To do this, it is enough to choose half a dozen arbitrary terms from the conventional grammar and to require their definitions. It quickly becomes clear that perhaps even the simple 'translation' is present (for example, activity word for verb), but the function determination is no longer active (primarily predicative statement function in the sentence in a dialectic interplay with the subject).

Instead of exposing the pupils to failure, it is more a matter of turning the tables and of reinforcing their inner preconception ("I know my mother tongue and therefore do not need any grammar!"). A practical test of a good dozen of partial language competences is intended to underline the first part of their conviction.

Encouragement Test: I master my mother tongue intuitively

“. Activated partial Competences ***A2.***

A2. Form four complete sentences which – besides other words – comprise the contents „somebody“

Task A: Form four complete sentences which – besides other words – comprise the contents „somebody“, „arrive“, „train“, „tomorrow“.

In Task A, I have activated my ability to form any number of different sentences in my mother tongue.
In B, to recognize discrepancies from the phoneme set of my mother tongue.
In C, to form any words of my language.
In D, to recognize the connection of individual words in the sentence.
In E, to distinguish sentences of my mother tongue from other languages.
In F, to recognize the degree of deviation from correct mother tongue sentences.
In G, to distinguish identical from non-identical sentences.
In H, to distinguish degrees of formal similarity of sentences.
In I, to recognize the equivalence of sentences.
In J, to discover similar content in different sentences.
In K, to recognize ambiguous sentences.
In L, to recognize the stylistically best variant.
In M, to recognize a sentence at its boundaries.

The start-up exercise already aims at the most important and comprehensive competence, our creative ability to form any number of different and ever new sentences, or, as Wilhelm von Humboldt had already formulated some 200 years ago: to make "infinite use of finite means". Further exercises are mainly about deviations from the norm, whereby other languages are also interpreted as a deviation from our intuitive mother tongue standard. Positional variants or content identities are also able to activate our intuitive grammar, whose use is still unconscious at that time of investigation.

Four remarks on the prelude

1. The main goal of the competency exercises is to encourage the learners to engage in a lesson whose title names the provocative term "grammar".

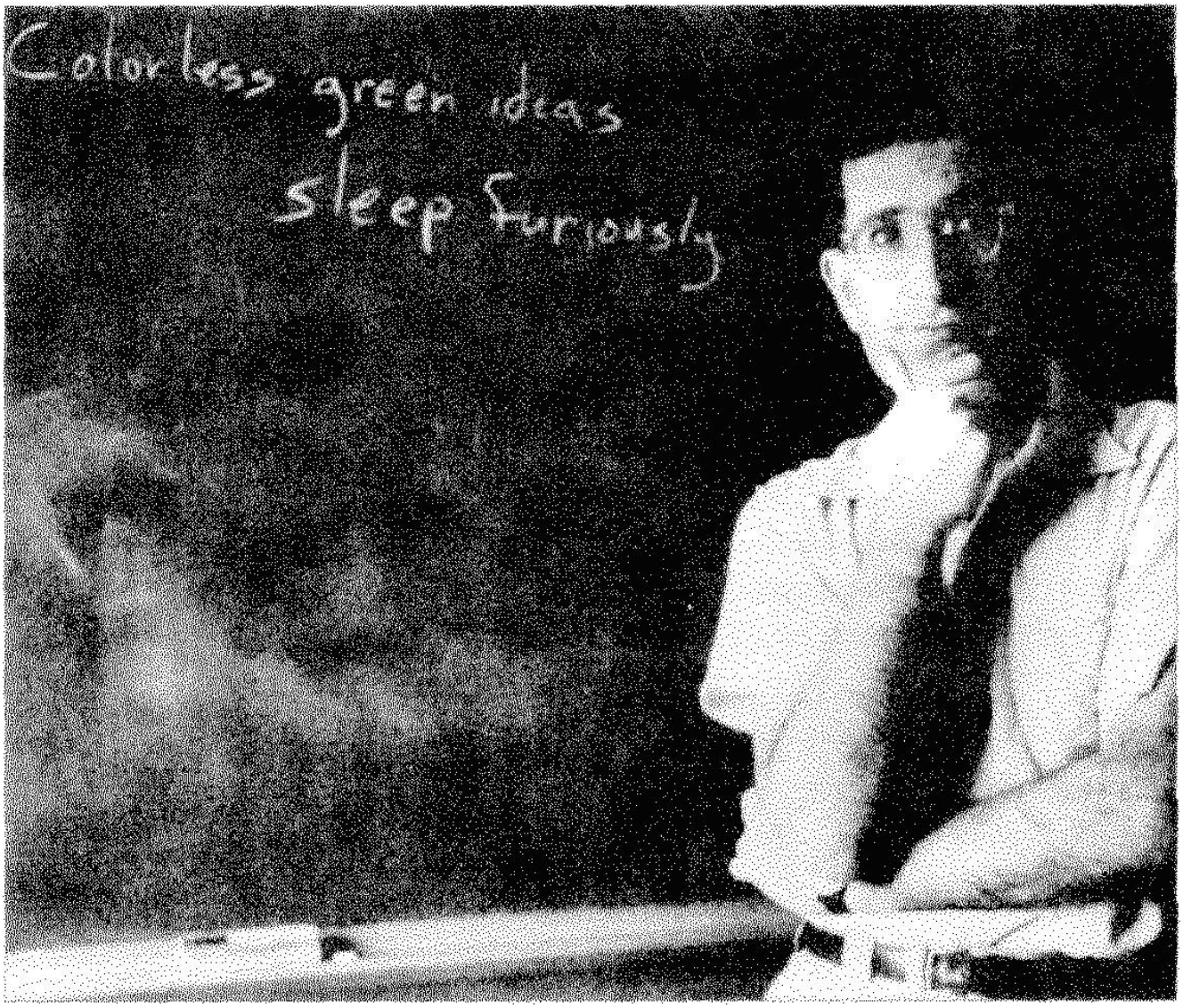
2. The mechanisms that are used to solve the competency tasks are not yet to be discussed. The discovery that speech and language comprehension is always and necessarily accompanied by the production of the corresponding grammatical structure is easier to mediate when the sentence is developed as the first linguistic universal (Act 1).

3. The suggested exercises are ad hoc examples. They can be modified, varied, replaced by others at any time. The best procedure is to pick the examples from our everyday conversation, from the language as it is spoken as a matter of fact. Also, the inversion of the tasks is always inviting, so that the learners 'invent' the exercises and confront each other with the problem.

4. According to Chomsky a theory of grammar must be able to explain all these partial competences we have, if it is to satisfy scientific requirements.

First Act: Discovering the Sentence (as the first Universal)

The Primal Scene of Universal Grammar



To begin with, the “Lehrkunst” didactics recommend to expose the subject of a staging lesson as a phenomenon as it is or can be encountered in the everyday life of the pupils. It may also be puzzling and trigger astonishment with the learners. Noam Chomsky, who as a university lecturer is also an experienced didact, knew this opening very early, because in the photograph of 1959, when Chomsky launched his theory of syntax, he stood provocatively beside a strange doodle on a blackboard:

Colorless green ideas
sleep furiously

The enigmatic writing and the questioning attitude of the teacher together form something like the (historical) primal situation of universal grammar. The best way is to extend this image into the schoolroom and to unite the class in a relaxed discussion around it. Let the students express themselves freely in their everyday language and get rid of all school barriers. All contributions are welcome and appreciated, there is no time pressure and no evaluation at all (no "correct" and no "wrong"!). The teacher’s role is that of a cautious moderator; he or she has only to ensure that the class soon discusses among themselves and about the subject. These rules of the so-called Socratic dialogue should be known to the learning group beforehand.
So let’s try!

It is not important that the learners find a "solution", for instance to explain that this is a way of exposing the genetic semantics of the syntax. Instead, they should develop the paradox of this utterance and ask questions. Is a meaningless sentence in a language still a sentence? How do we recognize at all that it is a sentence. Can it be translated? For instance into the Dutch language?

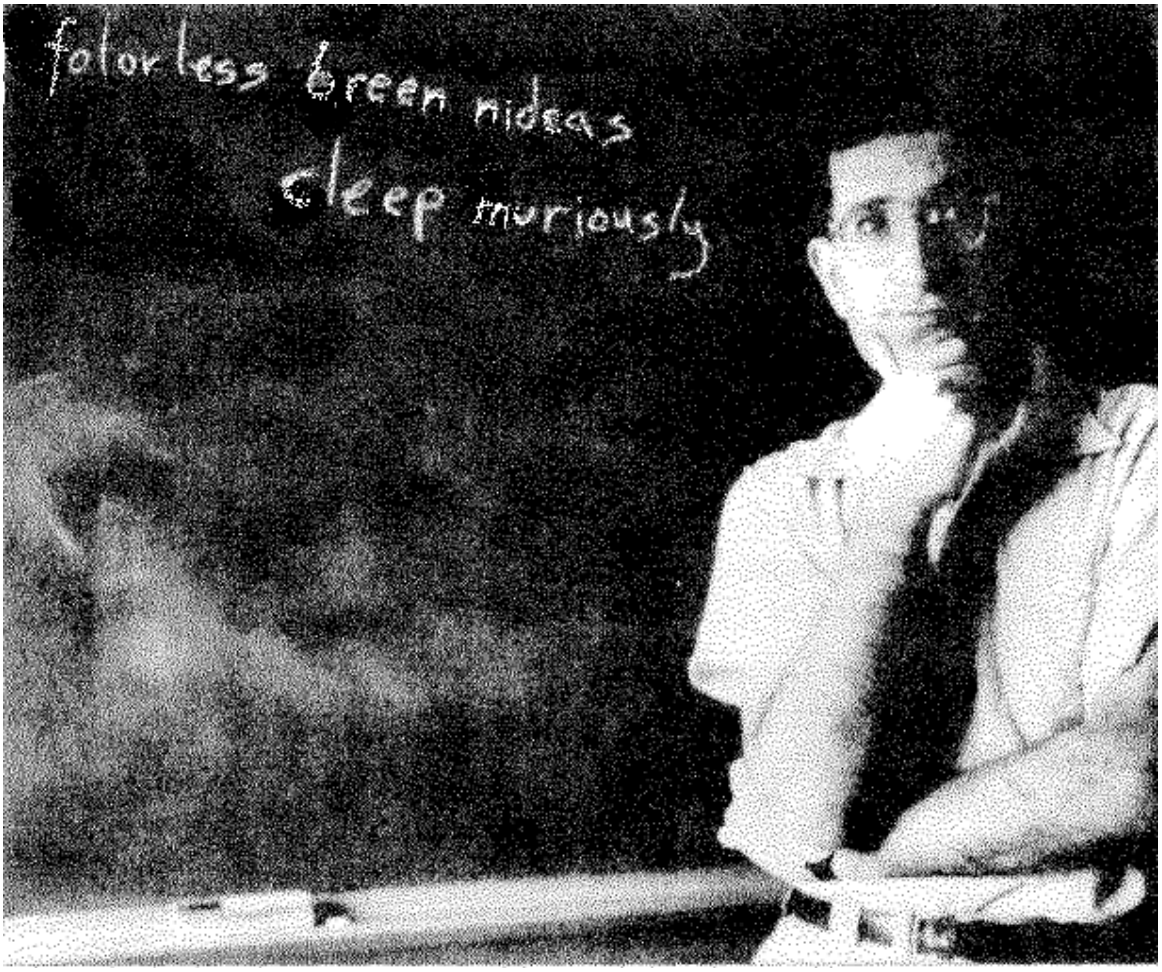
kleurloze groene ideeen slapen woedend

Why did the man write it like this, and not in another way (There is no full stop at the end, for instance)?
If, after some time, the discussion is exhausted, it has been useful to turn the provocation screw with the following variation of Chomsky's writing:

Folorless breen nideas
cleep muriously

Can we still translate even this sentence? How would it sound in German, in French, in Dutch?
How do we recognize the language in which this sentence is expressed? What is correct or regular with this sentence? What would be a clear standard deviation? How many sentences of that kind can we make in a language? What is their regularity?

Radicalizing the nonsense sentence in order to expulse semantics



What is a sentence at all? None of the traditional grammars used in schools explain why it utilizes the sentence as the basic unit, i.e. why it operates as a sentence grammar. For any content definition (the sentence as a meaning-conveying language unit) or any formal sentence definition (the sentence as a self-contained language unit consisting of words) cannot explain the phenomena exposed by Chomsky because both ignore the genetic-functional aspect of speech production. We therefore recommend, as a next exercise, to make an approach from the outside to the sentence as it appears in the natural (the spoken) language.

We imagine that we are once again the babies or toddlers, we all once were, and would hear the language in the environment into which we were born.

Or else we would be language researchers, armed with recording equipment and notebooks, visiting a newly discovered tribe with a previously unknown language. How can we proceed to gain an understanding of this language? To do this, we do a test: we hear a spoken text of a foreign language and try to figure out how many sentences the text contains. It is advisable to play the text two or three times, and then, at the end,

ask of all the learners how many sentences they have "heard" or segregated within the stream of language.

Determining the sentence boundaries with a foreign language text

Situation 1

Situation 2

The result will show a high degree of consistency, as it is one of our first intuitive competences to implement the sentence segmentation. Tests with small children have shown that with normal language development, they recognize sentence boundaries at an age of around 6 months. The clarification which were the characteristics we have checked in the course of these exercises (breathing, intonation, pauses) leads us to a first thesis: The sentence is a linguistic universal because all languages segment the stream of speech in the same way (and secondary: they link this segmentation with a sense unit).

After this (over) hasty solution of the task we can return to the true complexity of the phenomenon with another exercise on the same material. We have the foreign language text run twice again, but this time with the goal to find the number of words it contains. An impossible task, the scatter of the number of words found will be so great that only one conclusion remains: This is not the way it works! No language separates words in their prosody by pauses. The ‘letterisation’ of a language where such breaks are marked with gaps leads us to a wrong track. How we have learned to segment the words in the speech flow as children, will remain an open question for the time being.

One hint that we have to return from the single word to the whole of the sentence in order to tackle this problem correctly can be the following exercise or language play, beginning with an extreme form of ‘letterisation’:

Aoccdrnig to a rseaerch sduty at an Elingsh uinervtisy, it deosn't mttaer in waht oredr the ltteers in a wrod are, the olny iprmoatnt tihng is taht the frist and the lsat ltteer is at the rghit pclae. The rset can be a toatl mses and you can sitll raed it wouthit porbelm. Tihs is bcuseae we do not raed ervey lteter by itslef but the wrod as a wlohe.

First we can test whether this statement is true, whether we can read these sentences, whether this letter exchange works in other languages as well. And it works perfectly – and yet is a false thesis, because we do not read the word as a whole, but the sentence. To discover this is now the task of the learners. And a variation of this exercise (also this is possible in other languages) can lead to this understanding.

For if we group the word material differently, for example in a word list , we can well decipher the individual words (partly only at the second look), but never the sentence, however long the class tries to find out. The reason for this is formulated in the example itself, which we finally provide as a sentence with words in the same letter-order:
We nveer raed a sgline wrod by iestlf but we ccloudne its mnnieag form the oderr of the wlhoe sncetnee. As soon as the fmare of the steennce is teakn aawy – for inantcse in a lsit of wdros – we are at a lsos.

We never read a single word by itself but we conclude its meaning from the order of the whole sentence. As soon as the frame of the sentence is taken away – for instance in a list of words – we are at a loss.

tkaen	**at**	**is**
farme	**are**	**We**
inntacse	**of**	**aawy**
a	**soon**	**iltesf**
the	**wlohe**	**raed**
wrod	**the**	**in**
by	**as**	**cudolnce**
but	**lsos**	**lsit**
for	**as**	**of**
we	**sgline**	**miaenng**
a	**neevr**	**secnente**
its	**of**	**oerdr**
wdros	**the**	**the**
form	**scenntee**	**a**
		we

The exercises in the first act aim at experiencing the sentence as a universal functional connection of language. The discovery of the generative principle, that is, of the sentence as a connection of origin, is reserved for the second act of the staging lesson.

Second Act:
Discovering the threefold language genesis and the generative principle in the formation of language

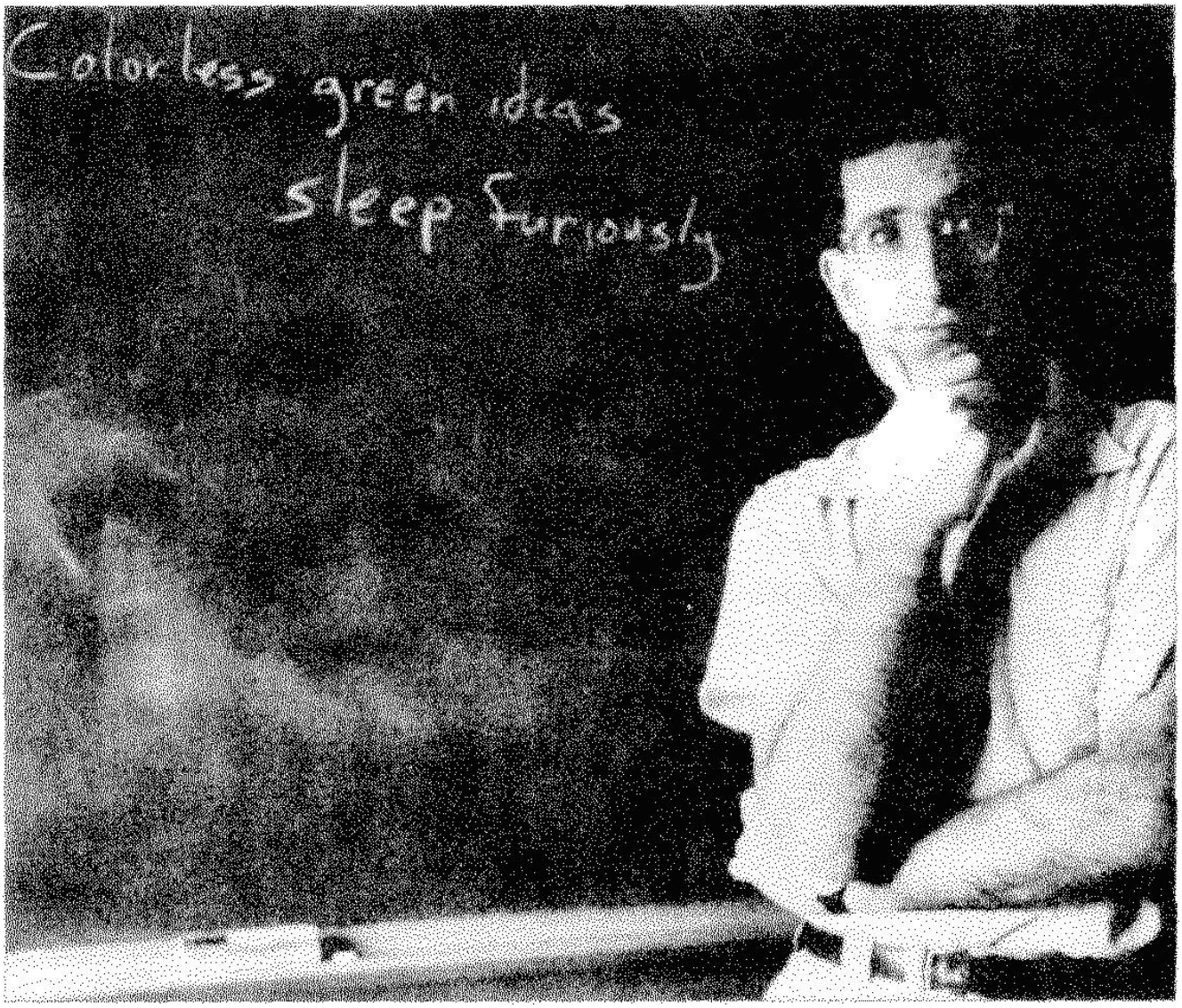
Leading Question: *How do we attain language?*

Since natural, spoken language can only appear by way of chained-up sound utterances over a specific period of time, it is always a non-permanent phenomenon. This basic fact is superimposed by the graphical representation of language. If we see language in text form, we get the wrong impression that we could capture and visualize language through texted language. But texts are always only scores, i.e. phonological instructions for the conversion of language into chains of volatile tones. The actual production process of language (and, more important, the re-production or understanding process) is hidden and is difficult to uncover, especially since students have not become acquainted to grammar as a set of generative rules.

Nevertheless, for the center of the staging lesson, the discovery of linguistic genesis, we are best grouped together again in the semicircle in front of the iconic picture with the young Chomsky before his text nonsense sentence on the blackboard. We still have not understood how such a sentence is produced. Again, the (same) rules of the Socratic dialogue apply: All participants are equally qualified, all statements are taken seriously, we conduct an unlimited discussion in our everyday language, the teacher cautiously moderates and never "betrays" any solutions. But first, we can help the sentence on Chomsky's blackboard to find its sound again.

The easiest way is to start with the question of the *actual genesis* of language. How does language emerge here and now, at the present moment? Language exists only (for all of us), if it is pronounced aloud as a sound sequence. If everyone is silent, (which we can try for half a minute), the language is gone. Where has it gone? Do we think in language when we are silent? Or are there rather intrinsic images or conceptual fields that are at the beginning of the verbalization? Do we pre-formulate sentences before we express them? Or does the sentence arise while we are formulating it? If we begin to express a sentence, do we already know how it will end? Does the sentence structure follow grammatical rules? And vice versa: Do I need to know the grammatical sentence construction in order to understand an uttered

sentence? Is the understanding process the exact reversal of the speech production process? When hearing a sentence, do I have to trace it back to the original thought of my counterpart? And is this still the same thought? Is the blue in the sky, which my conversation partner makes me aware of, the same blue for him and for me? And what about using foreign languages? Do I formulate each sentence first in my native language in order to translate it word by word? And do I have to "translate" the grammar as well?



All these questions in a nutshell: *How do we attain language* – at the moment of speaking? (in German: *Wie kommen wir zur Sprache?*)

Questions about questions, each of which would require its own research program. Three aspects are important in this part of the dialogue.

1. It is urgent that to offer such opportunities to discuss to the learners in language teaching, which are spread over a wide range between their learning experiences and language philosophy.

2. The actuality context and process nature of natural speech production and understanding should be outstanding as core features.

1. The actual genesis of language *How does language emerge here and now, at the present moment?*

With respect to the sentence, a first conclusion would be: Each sentence is always newly created at the moment of its utterance and with it we imperatively deliver its grammar.

3. If the discussion is open the students will soon touch on another aspect of the language genesis: the historical one. First perhaps the so called ontogenetic aspect, provoked by the question: How did we acquire language when we were young?

2. The ontogenesis of language *How did we acquire language when we were young?*

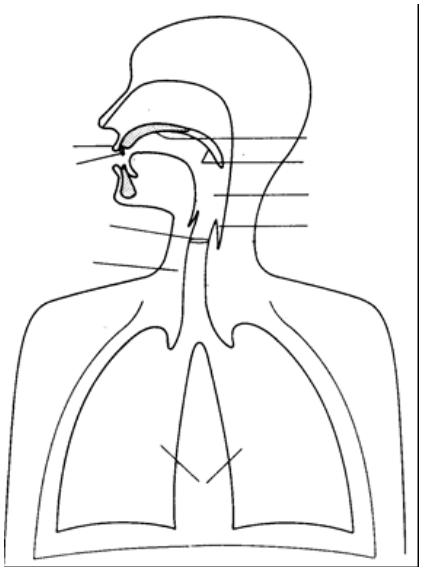
The second aspect is the so called phylogenetic one initiated by the question: How did our ancestors develop language?

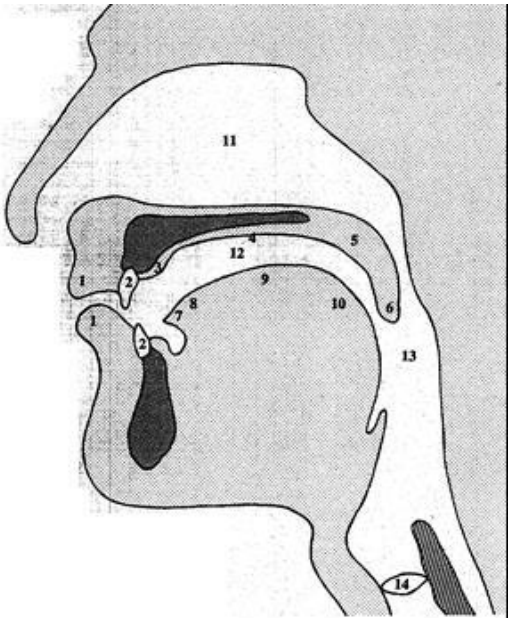
1. The phylogenesis of language *How did our ancestors develop language?*

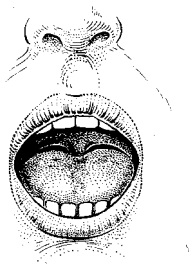
All 3 questions unite in the overall leading question which can be asked anytime in the course of the staging lesson: How do we attain language?

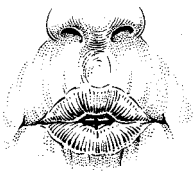
The following exercise may fit the ontogenetic aspect of language: It is part of our human development as a child to discover our own body and so the organs that we use – mostly secondarily – for language production: the whole body as a resonating cavity, then, of course, especially the lungs, the larynx and the cavities of the neck, the throat and the nose, together with the tongue for articulation.

Ontogenetic approaches: fitting in our specific phonetic language set
Discovering the organs of our sound production and the places and combinations of phonemes.

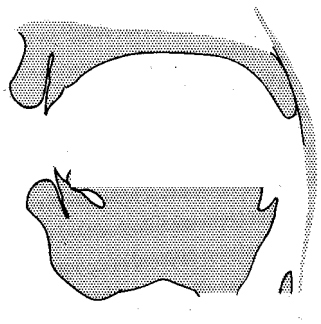


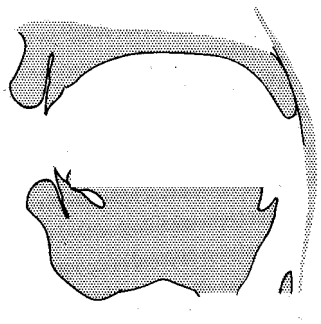


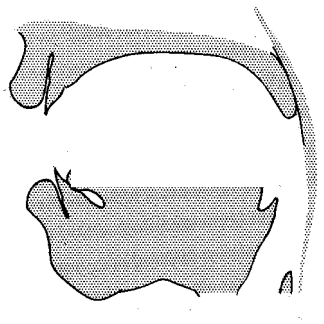




A: **I:** **U:**







With this equipment, a child is able to learn to pronounce all languages perfectly. By way of his ears, however, it perceives sound-strings of a certain speech environment and thus learns and imitates the specific phoneme set of his mother-tongue (and its corresponding prosody, i.e. speech melody, speech rhythm and speed). As adults, we have become so accustomed to the (restricted) phoneme set of our mother tongue that we speak the foreign languages with an "accent". But one of our grammatical competences includes the ability to assign "accents" to native speakers who speak in our mother tongue.

To this end, we do some playful exercises and explore the anatomy of our speech apparatus, as well as some selected articulation places, in order to understand how sounds are formed.

How can the toddler find out what the words are and which of the sentences belong to his mother tongue?

Exercise
Take our Chomsky pattern sentence *Colorless green ideas sleep furiously* and pronounce it in the following "tones" (a - e):

A) The way you read it without further consideration
B) Out of a dialect background
C) With a perfect stage-language accent
D) As a French speaking person would read it
E) As an American would read it

As a matter of fact, “Lehrkunst” didactics are trying to promote and preserve an attitude of astonishment. For this reason, a text about the so-called bootstrapping paradox is shown in the context of the language ontogenesis, which shows that science cannot yet explain the processes of early language acquisition. The only clear result of research is that its start is at a very early stage of our development.

Phases of Early Language Acquirement

Age	***Ability***
4-6 months	Recognition of the native-speaking prosodic features (rhythm and intonation). At this age, the child is also able to distinguish grammatical function words (articles, prepositions, subjunctive conjunctions, etc.) on the basis of their phonetic features of nouns (nouns, verbs) and to recognize their own name in the speech signal.
6 months	Recognition of the underlying syntactic structures of the mother tongue (sentence and phrase boundaries)
6-9 months	Recognition of the word boundaries in speech flow. With this performance, the child is given the most important function of speech processing, namely the decomposition of utterances into individual words ("segmentation").
6-9 months	Start of the babbling. This is not "universal" but depends on the specific sound structures of the mother tongue.
18 months	The recognition of the grammatical relations (subject, object, etc.) occurs early in the one-word phase.

The Swamp Adventure of Baron Münchhausen

In the German-speaking world we do not use the saying of the bootstraps which serve as life-savers, but he Münchhausen story of the baron, who – on his horse – saves himself from drowning in the swamp by pulling his own pigtail out.

If we ask about the phylogenesis of language, that is, how our ancestors have developed their language, we are confronted with the same phenomenon: We know little reliable, but here, too, the boundaries continue to shift into the early period. For this purpose, map material and texts on the situation of evolutionary research (overview articles and book abstracts) as well as on language creation myths (Bible text) are provided in the PDF -"materials", 2nd Act.

One of these late theories is the attempt to explain the genesis of language in a change of caring attitudes by mothers and child. The so called motherese, the sounds a mother or care person uses to still a child who is separated from the body of the mother, could well be at the origin of language. Here a short text by the US anthropologist Dean Falk.

Phylogenetic theories concerning the motherese

Human toddlers, unlike chimpanzees, eventually begin using gestures to communicate about ideas or objects that are not present, and their vocalizations become crucial for conveying the intentions behind their gestures. Our proclivity for vocalizations about external or abstract ideas (instead of primarily self-centered ones) may have started when early hominin mothers began putting their babies down while foraging nearby. As mothers' and infants' voices began substituting for their clinging and cradling arms, their vocal communications started to take place over short distances. So for the first time in prehistory, young infants were routinely separated from their mothers, causing each to become part of the other's external world. Such separations would have been conducive to the emergence of intentional gestures about external events and ideas. ***From: Dean Falk: Finding Our Tongues. Mothers, Infants and the Origins of Language, New York: Basic Books 2009, p. 1***

FIGURE 4.2. The Dikika baby is held by her mother. Note that the baby is portrayed with a non-grasping big toe, although this is not yet verified. *Image courtesy of Chris Shaw, National Geographic Society.*[13]

On the genetic approach in general we provide two video excerpts where Noam Chomsky himself can be seen – an opportunity to get in touch with a researcher who is still alive.

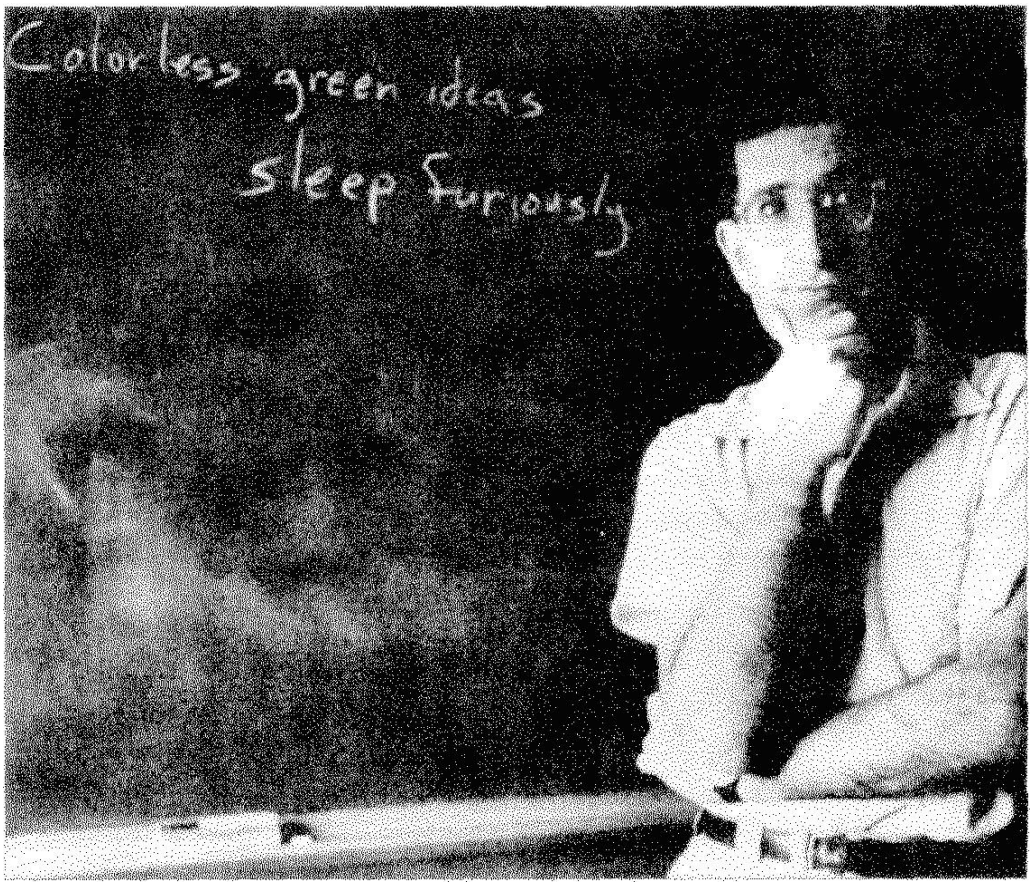
How all these materials (or others, which might just be around) are placed and used in the classroom belongs to the freedom of the variations. Two intentions, however, combine with this part in the second act:

1. With the leading question, we open up an immense field of research, which leads to many partial areas of the sciences, but all of them are bundled together in anthropology and therefore they directly concern us as human beings. The learners can realize here where the linguistic sub-subject "grammar" is located in fact and how important the study of language production and comprehension rules is.

2. This study is only promising in a researching mode with the actual genesis in its center. It is our daily speaking practice is the research field where we can always learn with the tool of our intuition. The students should be encouraged to collect further questions of their personal research or of public projects, to gather their thoughts, ideas, suggestions, texts, links, etc., and to add them to their personal portfolio.

Third Act:
Expanding the generative syntax of sentences

At the beginning of the third act of the staging lesson we go back in time. If we are grouped together again for the Socratic dialogue in front of the blackboard with the young Chomsky, the (historical) research situation at the beginning of the sixties is the starting point of our common considerations. Chomsky had come to the most famous scientific research center in the USA in the mid-1950s, the MIT (Massachusetts Institute of Technology). At that time, the US armed forces funded a project for a translation machine, in which Chomsky (as the pacifist and anarchist, who he was already at that time) did not want to participate. But the task of basic research in linguistics fascinated him enormously. And so he faced this problem and our learners can help him. How can we program a translation machine (as we say today) that translates any sentence of a natural, spoken language into a correct sentence of another spoken language?



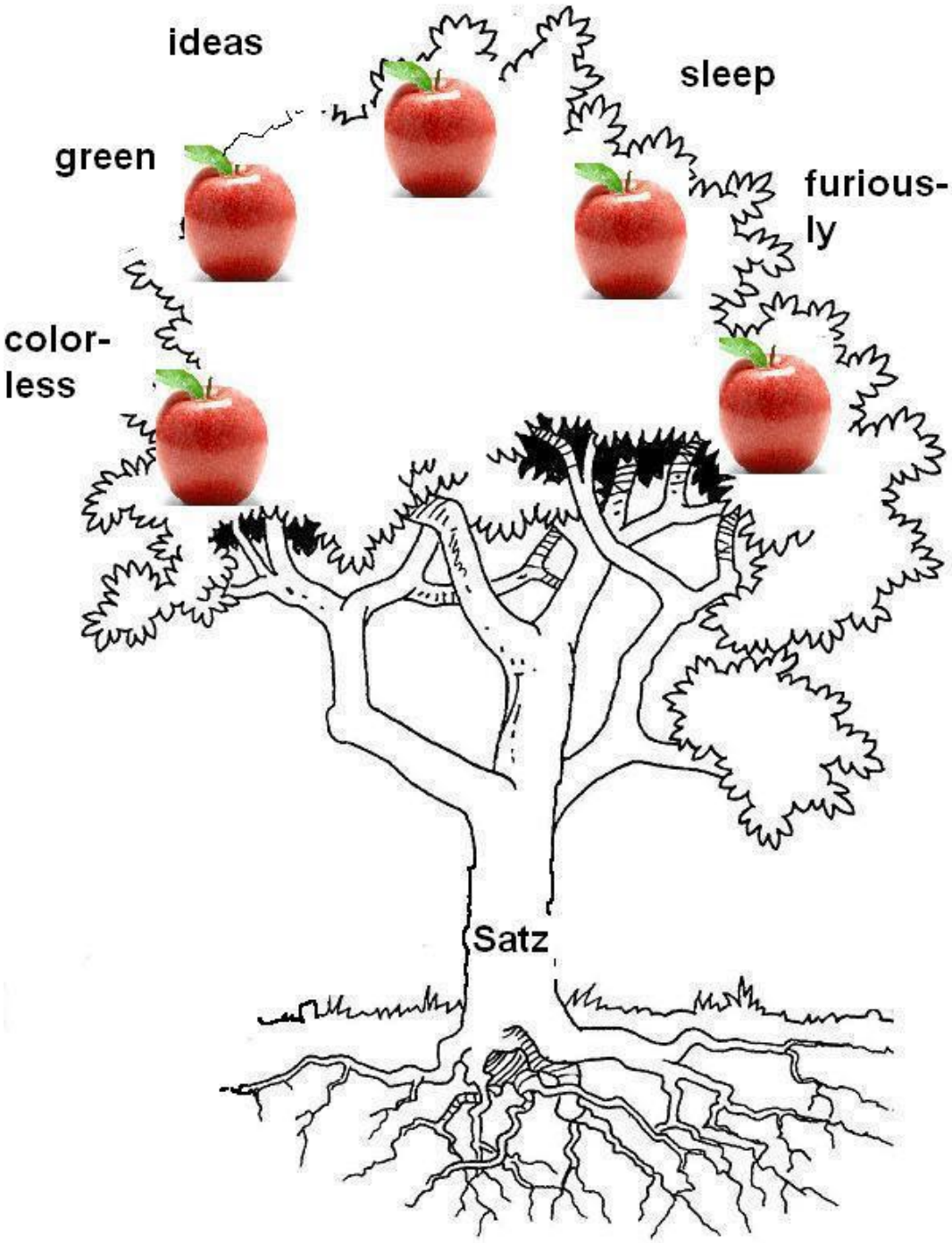
How can we help Chomsky to develop his translation machine?

After having discovered the sentence as a linguistic universal in the first act, it is legitimate here to define the task already as Chomsky himself had formulated it. We use linguistic terminology when operating with the sentence concept. In all other respects, however, the following principle of the late Martin Wagenschein is still valid: everyday language before technical language. If the learners use grammatical terms in the discussion, they can do so; if they choose everyday language descriptions or approximations, their contributions are equally valid. The goal of the Socratic dialogue is that the class members are able to talk to one another about the matter in hand und to freely present their ideas.

As a point of reference and example, Chomsky's nonsense sentence *Colorless green ideas sleep furiously* can always be used on the image of our primal scene; (of course any other sentence is just as suitable). What steps does it take to produce from this (English) sound sequence a different (German, French, Dutch) sound sequence whose contents have the same meaning? What rules do we need to follow to get from a sound string *[ˈkələləs]* colorless to a sound string *[ˈfarplo:s] farblos or kleurloos* or *[ɛ̃kɔlɔʀ]* incolores? And can we keep the word positions the same when translating the English sentence into French (or Dutch)? The advantage of the translation task as opposed to the original question of how the rules of generating a sentences in general is twofold: Firstly, to translate is a normal task and part of all language lessons (often also in science lessons); secondly, learners know today that there are translation machines in the internet, but also that many of them work insufficiently. The assumption that purely "lexical" attribution errors are "to blame" is usually no issue any more; what remains is to investigate the sentence structure.

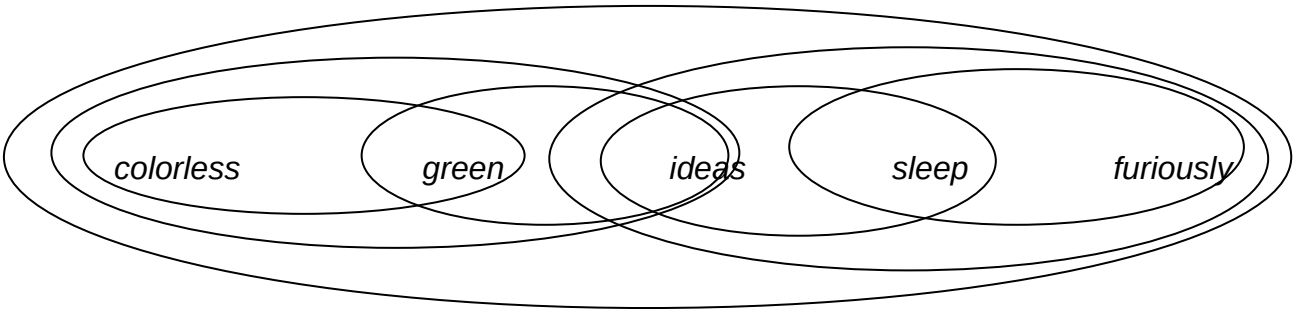
In order to stimulate their thinking in structures, it is useful at this point to introduce tree metaphor to the class (see the tree in the PDF "Materials", Act 3), especially since Chomsky himself uses so-called structure trees for the representation of his syntax theory (funny, but his trees grow upside down!): A sentence grows like a tree from a stem over many branches, until we can "pick" it in the form of fruits (the hearable sound sequences). The stem (S), however, is not the beginning, but only a bundling place, since every tree has a very large root as a "supply-tool". In language production these are the speech utterances of others as well as the speakers own ideas, the images, memories, his knowledge, his questions, even the motivation to express something.

The structure tree as a helpful metaphor:



In a staging of the “Lehrstück”, a student said at the end of the Socratic dialogue in the third act: "A complete translation requires a comparison of the sentence structures, so that a complete sentence results in the end." This insight into the derivation or function context, in what Chomsky called the deep structure of a sentence may lead to an analysis of the sentence syntax, which we can again apply to our pattern sentence. Once again, we start with its appearance or surface structure and test our intuitive

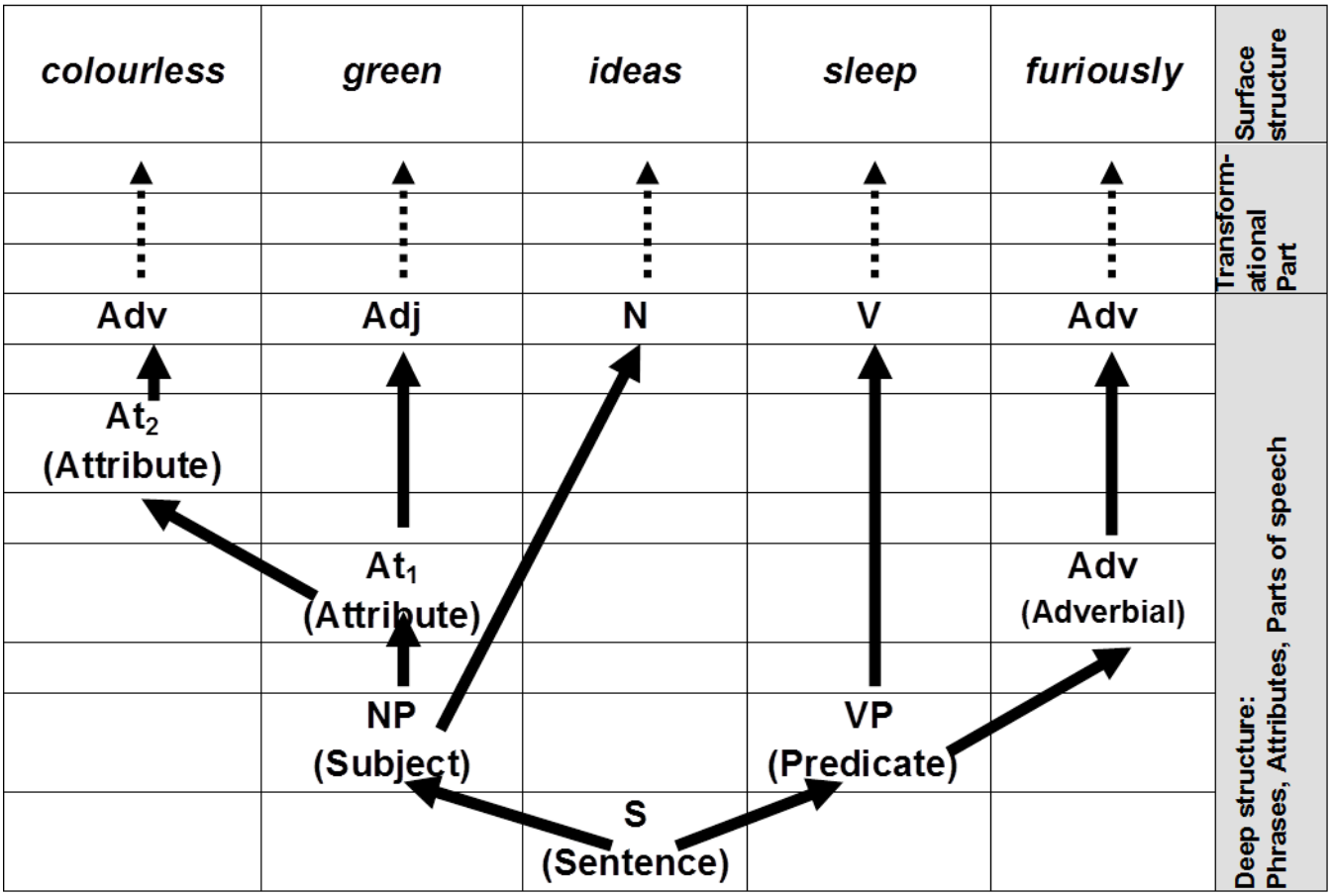
knowledge of the deep structure with our circle entry exercise (which we already practiced in the prelude): Which words belong together?



The reason for the togetherness or the cohesion can well be formulated in a non-grammatical terminology in the style of: "Furiously describes more closely how this sleeping occurs". In a first step, the entire derivation in the tree structure can also be described with arrows (and derivation planes), so that the discovery and reinstatement of the traditional grammar terms (subject for nominal phrase, etc.) are only installed if everybody has understood the principle of sentence generation and derivation.

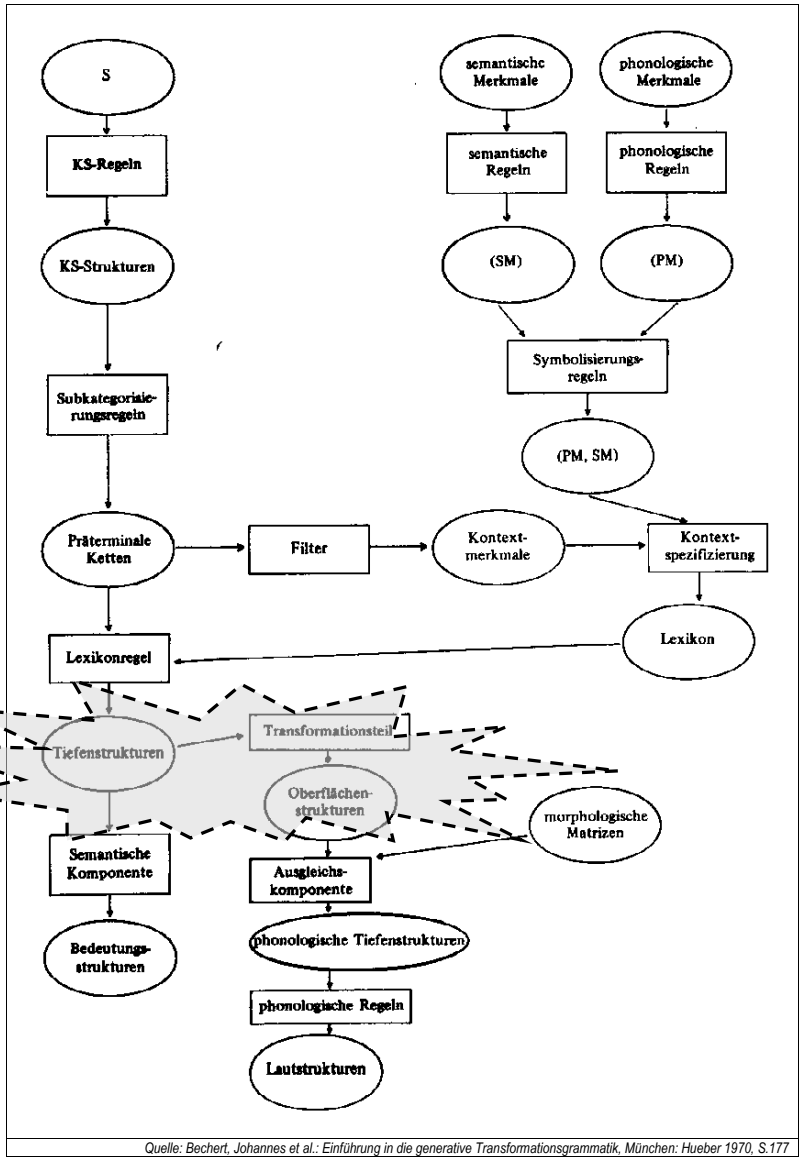
Derivation and representation of the current syntax categories in the tree structure

The syntactic generation of Chomsky's example sentence



The rediscovery of the familiar grammar should be accompanied by an overview of the overall system of the generative transformation grammar (see the schema of the Generative Transformation Grammar in the PDF "Materials") in order to clarify two aspects:

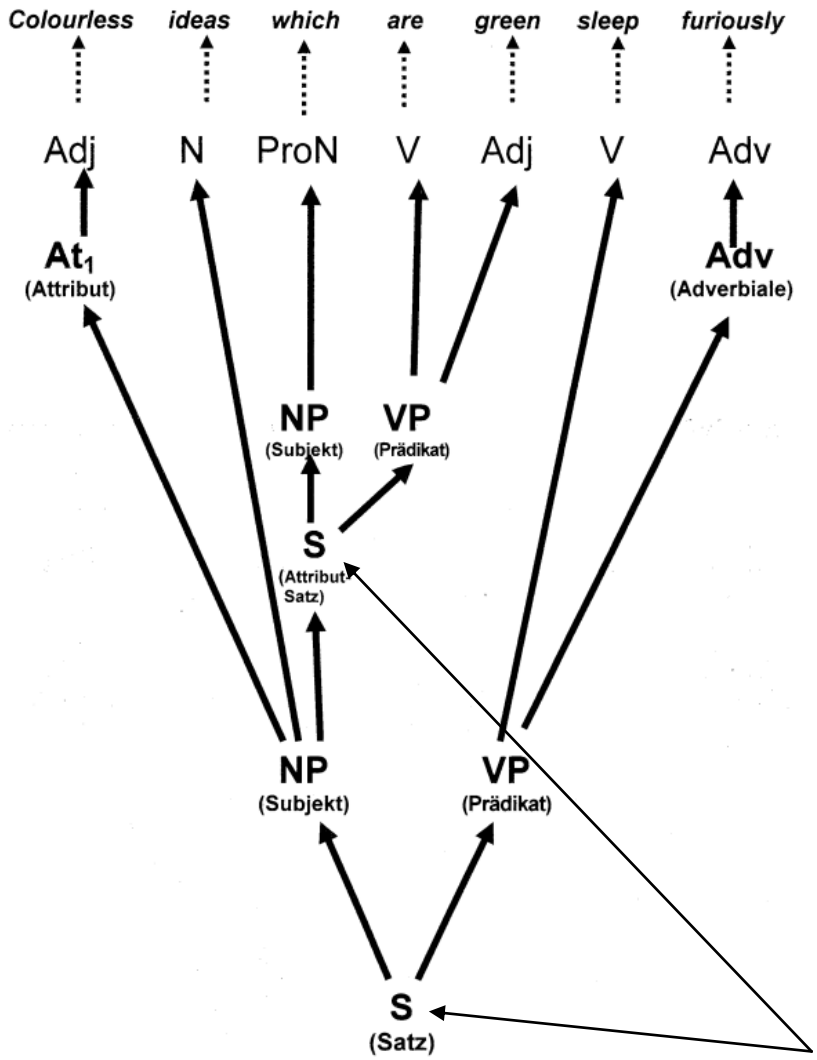
1. There are much more components than just the syntax (namely morphological, semantic, phonological, lexical components) to make the translation machine function, which can be used universally,. Chomsky himself described the requirements as follows: "*Thus, his (the speaker's) grammar must, then, contain a finite system of rules that generates infinitely many deep and surface structures, appropriately related. It must also contain rules that relate these abstract structures to certain representations of sounds and meaning – representations that, presumably, are constituted of elements that belong to universal phonetics and universal semantics, respectively.* "(From: Noam Chomsky: Language and Mind, New York, Chicago, San Francisco, Atlantis: Harcourt, Brace & World 1968, p. 15)



Quelle: Bechert, Johannes et al.: Einführung in die generative Transformationsgrammatik, München: Hueber 1970, S.177

2. The syntax, however, has such a central position within the deep structure for the generation of sentences that dealing with this "core" grammar is highly justified. It is crucial that the learners discover the sentence syntax rules as the motor of language, thus as the source of their language and mind creativity. This discovery is also possible in the simple sentence, but it becomes formally clear only when the same elements recur in the derivation (recursivity of NP, VP, or S in the complex or compound sentence).

As soon as we have carried out the derivation of a sentence with the aid of the representation in the tree structure, further exercises are possible with any sentence of any natural language, including those which the learners "pick" from their own speech practice. The direction of the question can either focus the sentence production process (type: Which sentence / which sentences are possible for the following tree structure?) Or it focusses the understanding process (type: What is the tree structure of this given sentence?). The possibilities of variation are extremely diverse – to the point of confusion. For this reason, it has proved useful to practice with the same sentence material as before and to move from simple sentences to more complex forms like in traditional grammar courses. In the "Materials" (PDF) practice examples for Chomsky's nonsense sentence are given in English, German (in two variants) and French.



Discovering the creative core of our language

The repetition of a step in the derivation of the deep structure (recursivity) shows us why language is potentially of unlimited creativity.

The clever didact Chomsky consciously constructed this sentence as a simple sentence with an intransitive verb and hence no object. As soon as we choose a transitive verb (for example, "to feed" instead of "to sleep" in Chomsky's sentence), we add a second nominal phrase (object) beside the subject, repeating a derivation command (expand VP to V and NP). This process of recursion (repetition of a derivation step) shows what (potentially infinite) creativity is called on the syntactic level. With my language, I have the possibility and the freedom to form increasingly complex sentences in ever new ways. Limits are set only on the level of the so-called performance, so if a communication partner does not understand me anymore because his absorption capacity is overstrained. This last sentence with two interdependent sub-clauses is probably an edge case, but complex sentences as a compound sentences with a main and a subordinate clause are completely normal in our everyday communication. If we conclude the third act of the staging lesson with the derivation of a (simple) sentence, we have achieved a double goal:

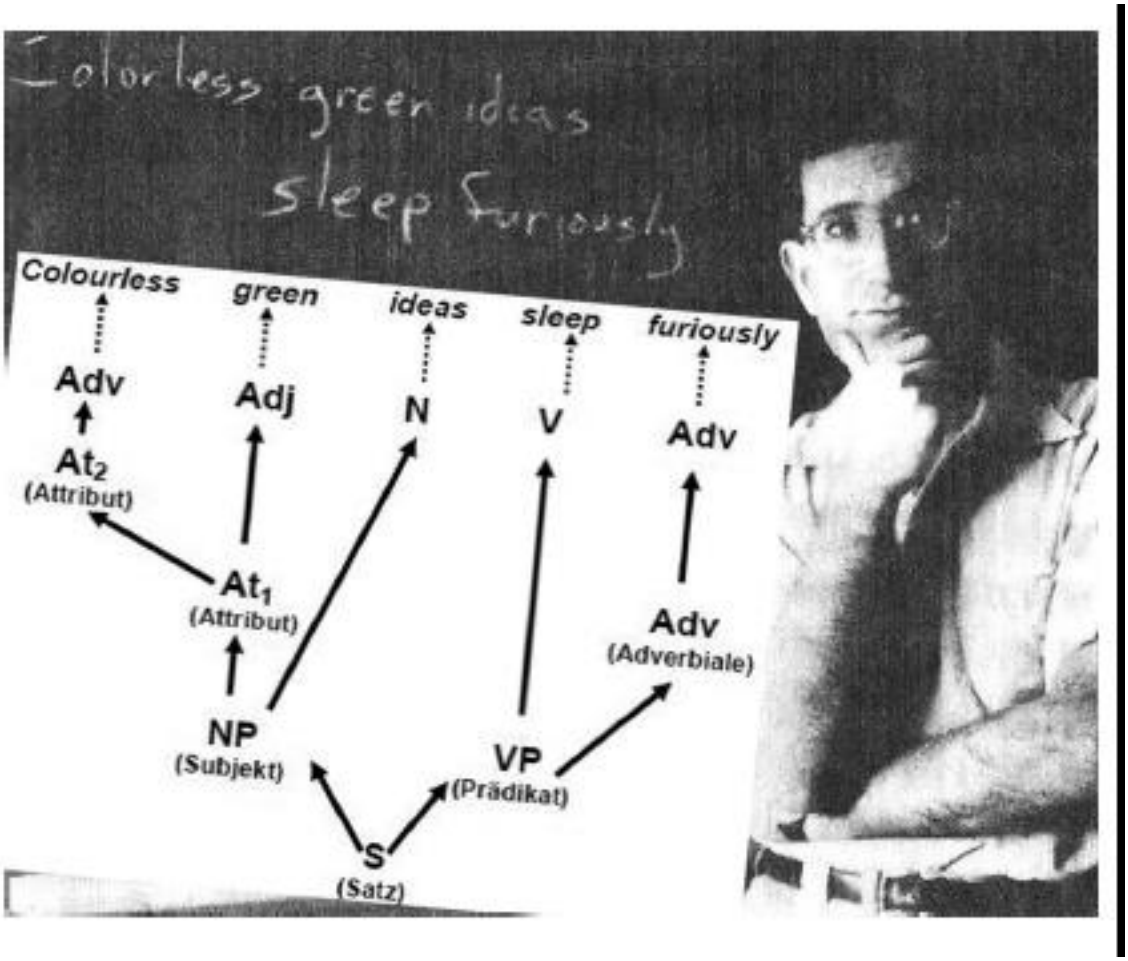
1. The self-enbedding of S in the sentence derivation again shows how syntactic recursivity becomes a source of linguistic creativity, how finite means, which we apply several times, result in infinite use.

2. The learners can correctly locate and, if necessary, reevaluate the syntax because the derivations in the structural tree show the dependencies (where a subordinate clause follows) much more clearly than the hierarchical terms (such as object clause, attributive clause etc.).

In the "Materials" (PDF, Act 3), the slightly modified nonsense sentence is an example: *Colorless ideas which are green sleep furiously.*

Finale:
Looking back at our path of learning in the staging lesson and assembling our personal portfolio

The conceptual image (“Denkbild”) of the staging lesson (in the PDF "Materials", Finale) unites the primal scene of universal grammar, the young Chomsky in front of his nonsense sentence on the blackboard, with the generative derivation of the same sentence in the representation of a (reverse) structure tree. In this way, it tries to build a bridge within the staging lesson: from the first puzzling about the linguistic universal of the sentence to the representation of its genesis in the deep structure together with hints of the transformations into the surface structure. The reintroduction of the traditional grammar terms shows their place as functional terms of the deep structure.

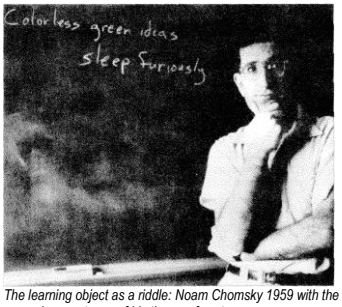


The conceptual image (“Denkbild”) serves as a reminder and could well provide a cover sheet for the personal portfolio, which all learners can fill with their collected material.

A slightly more detailed description is provided by the synopsis of the subject on a single page (also in the PDF "Materials", Finale), where the learning path is roughly sketched in the course of the three acts. This representation may perhaps serve as the reverse side of the conceptual image (“Denkbild”). Both representations, the conceptual image and the synopsis on the single page, are also very well suited as tasks for group work in the finale, then with the order to find a graphical implementation of the staging lesson for a poster. Of course, the learners should also try to answer the open questions raised from the class discussion.

Staging Lesson „Universal Grammar with Noam Chomsky“

One-Page Synopsis of the Staging Lesson



The learning object as a riddle: Noam Chomsky 1959 with the exemplary sentence of his theory of syntax

At first, sitting in a semicircle, we're wracking our brains about this thoughtful man: Is he fooling us? We can see that his word sequence on the blackboard is a correct sentence of the (English) language, but it is a constructed nonsense. However, we may wonder about our own language competence if we still recognize a radicalized version of it as a sentence: *Folourless breen nideas cleep muriously.*

Is it so easy to be creative and add new words to a language?! Change the initial consonant so that it still sounds English. Does this also work in German, in French, in Dutch? Let's try it out!

Sure, it works, but what about this playing around? Is it possible to learn something about the functioning of language? Well, a language researcher discovering a new tribe would be confronted with such unknown linguistic structures, as we all were at the beginning of our entering the mother tongue.

The Leading Question: How do we attain Language?

Apparently, Noam Chomsky, with his provocative sentence, asked this question – our leading question, and this three times: How did we, as learning children, enter the language of our environment? How have the languages developed (systematically)? How do we finally get to understand new sentences every day and to utter them ourselves?

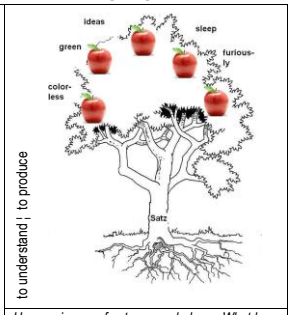
Let us move back into the status of babies and listen to a text in a foreign language from which we do not understand a word, but whose sentences we recognize as a (universal) structure.

Let us raed a steecnne lkie tihs for a cgahne and let us divceosr its esteinsal intnrcnoeecotin lkie tihs!

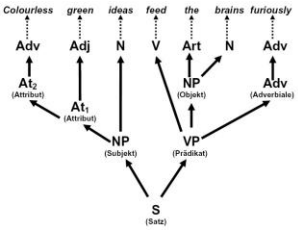
And why can we easily imitate an American pronouncing French sentences or a French speaking German? Obviously, we approach a language from the outside (via listening and imitating), but how did we know, as toddlers, that the verb refers to the subject in each sentence, i.e. to the noun or pronoun in the nominative?

1955: Two years after the end of the Korean War, the US Army sponsored a project for a translation machine at the MIT (Massachusetts Institute of Technology) in Boston. Chomsky, pacifist, and anarchist even then, refused indignantly to participate in this project.

But of course, the basic research problem was of greatest interest to him as a matter: How must a translation machine work that can convert any sentence of any language into a sentence of any (other) language? We need a longer brainstorming of the whole class to help Chomsky.



Here an image of nature may help us. What has to work out in a sentence tree until we can reap the fruits of the sentence (i.e. the uttered words)? Each time quite something has to grow and be generated!



With every sentence we produce (or generate, as Chomsky called it), we also deliver its grammar, which can be represented in a so-called structure tree. And that in every language! Only by "unwinding" this functional interconnection our translation machine keeps going – also if we want to understand a sentence in our mother tongue.

Finally, we find ourselves again on familiar terrain – now we regain the parts of the sentence, the parts of speech, the attributes: Chomsky's exemplary sentence (supplemented by an object) forms 13 branchings on the syntactic level in our head – and still cannot be heard as a sound sequence. But we already see why the language is our most creative tool: We make unlimited use of its limited means.

In addition, all material, namely the exercises, the solution sheets, the texts, the film excerpts may be collected in the order of the course of the staging lesson in the portfolio (for repetition exercises and term definitions, see the PDF "Materials", Finale). In order to document the personal learning path, the collection should necessarily be supplemented by the individual notes, sketches, exercises, research, links, and above all by the open questions of the learners. For the staging lesson has a fundamentally opening gesture: it opens up a huge learning field, because human language is our most central learning and thinking tool – from the neurosciences to biology, from evolutionary history to anthropology, from communication science to psychology and language philosophy to physics (of sound generation) as well as to the theoretical and applied mathematics (computer programming). To clarify the position and the value of what is called “grammar” at school is a learning task which has only been launched with the completion of the staging lesson.