0 – English Summary[1]

"Recessive" Information in Language.
A Probabilistic Information Model as the Basis of Informational Linguistics and Systems Linguistics.

0.1 – The Model Introduced in this Book

This book provides a model and a terminology to fill gaps regarding problems linguistics has to explain certain phenomena like syntactic loan or similar changes in (apparently) non- or hardly-connected languages. In the case of similar changes researchers often claim polygenesis to be the answer, but polygenesis either means that new information has to be generated – a quite complex process contradicting e.g. the principle of Occam's razor – or that there has to be a reason for such parallel developments, which lies in the state a language has had before the change occurred. This reason might be described in terms of "recessive information" and makes an information theoretical and systems theoretical approach necessary.[2]

The model presented in this book – the linguistic model of recessivity – is a probabilistic information model integrated in systems theory and interdisciplinary approaches; nevertheless focus lies on language rendering a linguistic model. It is built up "bottom up", i.e. language systems are understood as conglomerates synchronized by the linguistic systems of individuals. Therefore individuals and their perception of language are fundamental for the model. So the "collective level" of language systems is understood to be an abstract, model-like, and simplifying construct that can be used to illustrate more complex connections between the language systems of individuals.

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1 The full discussion and especially the relevant and cited work of other researches can be found in the chapters of this book referred to in this summary.

2 The foundations of the systems theoretical approach for the model introduced here are especially the general systems theoretical works by Fagen and Hall (see Fagen/Hall 1956) and Luhmann (see Luhmann 1987).

The linguistic model of recessivity describes mechanisms of information transmission and information transformation and – in some aspects – even of genesis and loss of (at least meta)information within linguistic systems. It aims to uncover which information are preconditions of language change and which information are causing change by taking an information theoretical and systems theoretical look at language systems on individual level (i.e. "mental lexica" in a broader sense of systems covering all linguistic information and carried by an individual).

First of all, some definitions are necessary to clarify what we are talking about. The notion of the model was conceived because of certain observations regarding the history of German that seem to be comparable to the pattern of recessive inheritance in genetics. For example, Proto-Germanic **auke* originally meant 'and', then lost this meaning (then meaning 'also, too') in Old High German (*ouh*) and later gained the meaning 'and' (again) only in the High German dialect of Transylvanian Saxon (*auch*) (see chapter 3.1). Another case is the dativus absolutus in Old High German that is said to be a syntactic loan of the Latin ablativus absolutus, although most researchers agree that there was a dativus absolutus in Proto-Germanic, which might have been lost in the times before Old High German was spoken (see chapter 3.3). Taking observations like these as a starting point for discussion and critical examination, a general definition of "recessive" is extracted by means comparing those linguistic phenomena with the recessive pattern in genetics (see chapter 1.3). "Recessive information" is understood as every information of a genotype that is not perceived and therefore not part of a phenotype; this does not mean that recessive information is lost information. A general pattern of recessivity refers to information that once was part of a phenotype and that then became recessive (i.e. it then was only part of a genotype) and that finally became part of the phenotype again. So, the term of *recessivity* ultimately established in this book is an information theoretical term. I.e., recessivity in language shall not be understood in a biological sense, and also recessivity in genetics shall not be understood in a linguistic sense. Instead both concepts are understood to represent different variants of an underlying informational concept.

If our goal is a linguistic information model covering linguistic recessivity, we now obviously need to define a linguistic genotype and a linguistic phenotype (see again chapter 1.3). So – as working definitions – we define the *linguistic genotype* to be a set of all linguistic information in a linguistic system. Furthermore, we can assume this set to be constant, meaning that – in the context of the

introduced model – the linguistic genotype is the immutable core of every linguistic system. Linguistic systems can be found on both individual levels (located for example in the human mind) and collective levels (as for example a language system like the system of English). As already established, the linguistic model of recessivity understands collective levels as abstract, model-like, and simplifying; it focusses on language systems on individual level as the key factor in linguistic systems analysis.

The *linguistic phenotype* is defined as a set of all linguistic information that is actually "perceived". Perception of linguistic information is understood as a mental representation of linguistic information and thus can be effected by a physical stimulus as well as by thought – or rather: A perception of linguistic information can be caused by processes within the prevailing linguistic system or by interactions between this system and its environment.

Here, we understand *linguistic information* as all information that can be considered to be part of the Saussurean sign, which consists of a signifier and a signified.

Consequently, it is understood that linguistic information is mostly recessive and only temporarily phenotypificated (≙ 'to be part of the phenotype'). If we describe the linguistic genotype G, the linguistic phenotype P and the recessive linguistic information of a linguistic system R as sets, we see that:

1.) $\forall x \in R\colon\ x \in G \ \wedge\ x \notin P$
2.) $|\,P\,| \ \leq\ |\,G\,| \ \geq\ |\,R\,|$
3.) $G = P \ \dot{\cup}\ R$

Furthermore, we now need to adjust the terms language production and *language perception* for they can be confusing due to the fact that *perception* is a central term in our model. This is one of the reasons why I propose to replace the term *language perception* with *genesis of a signified* (triggered by the physical stimulus of a signifier) and the term *language production* with *genesis of a signifier* (triggered by a signified which might be meant to be uttered in order to exchange information regarding this signified). Another reason for this terminological replacement is the precision of the introduced terms, especially when understanding both processes as ways to complete the two-sided Saussurean sign (see chapter 5.2). Because we regard the information of a trigger in those processes also as a linguistic information this model makes linguistics "start" one step before, for example, the Minimalists "start" their linguistic studies (for their first step is usually the so-called "numeration" (see chapter 5.1 and 5.2), which consists of picking a set of linguistic elements that shall be formed to an linguistic expression later on (in our model, this would be the second step)).

It is assumed that a "genesis of a signifier" starts with a signified as trigger: an information the sender wants to transmit to an addressee (or rather "receiver"). There is now a huge number of possibilities how the signifier can be *phenotypificated* and the sender has to "choose" one (or more) of those possibilities which are all part of the linguistic genotype. To make a choice the sender will recapitulate the probabilities of the possibilities of phenotypification according to the intended information of the trigger.[3] The knowledge of linguistic conventions, therefore, is an important determinant for the final choice, because the sender aims to be understood in the way he/she/it intended. Every linguistic information phenotypificated (regarding both the signified and the signifier) becomes part of the linguistic phenotype within the linguistic system of the sender (which is, of course, a linguistic system on individual level); every other linguistic information in the system stays recessive. So we see that a linguistic system on an individual level consists at least of the linguistic genotype (providing the linguistic information that can be phenotypificated) and linguistic metainformation (such as probabilities for the actual linguistic information to be phenotypificated; those probability distributions are especially sensible for all kinds of contexts a phenotypification might takes place at).

As the sender finally sends a phenotypificated (and physically encoded[4]) signifier, the receiver has to decode it by choosing a signified that is most likely connected with the signifier sent by the sender ("genesis of a signified"). The receiver recapitulates the probabilities of the (phenotypificable) signifieds the sender could have meant to finally generate a complete sign consisting of the signifier sent by the sender and perceived (and phenotypificated) by the receiver and the signified the receiver has chosen due to the consideration of probabilities. Of course, the receiver – as well as the sender – can rely on linguistic conventions and, again, every information phenotypificated by the receiver is part of the linguistic phenotype of the receiver's linguistic system, every other information stays recessive. During a communication both sender and receiver are a *phenotypificator* at some point.

In order to formalize languages and linguistic phenotypifications, we can describe the process of phenotypification as a function f in a mathematical sense (where we meet with some aspects of Montague's "grammar" (see Montague 1970 and 1973 and chapter 2.6 of this book)). During this process a set P (containing all phenotypificated linguistic information) is selected from the set G (i.e.

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3 Neither the claim that the sender makes a choice nor the one that he recapitulates the probabilities of the possibilities of phenotypification do necessarily mean that those processes are done in a consciously manner.

4 I.e., for example, in a „spoken" or a „written" way.

the linguistic genotype) depending on the state of the linguistic system of the phenotypificator *S* and the state of the carrier of the linguistic system on individual level *C* at a certain time *t*. *S* can be understood as especially consisting of linguistic metainformation (i.e. above all the probability distributions corresponding to the elements of *G*). *C* can be understood as a more general appearance of the phenotypificator (including its physical appearance): For example, a human phenotypificator will not be able to phenotypificate phonological information he/she cannot hear or utter (such as ultrasound).[5] This is why *C* can only restrict the number of relevant elements of *G* that could appear in *P*, but never extend *G* (which we have already defined as a constant set). So we can conclude:

$$P = f(G, S_t, C_t)$$

In consequence of these assumptions, we have to regard linguistic signs as unstable connections of signifiers and signifieds which can only be stabilized in and for a certain phenotypification (e.g. in a certain communicative act). Both signifiers and signifieds can be understood as packages of smaller information (which one might identify e.g. with phonemes or semes). With regards to a linguistic sign (or more general a linguistic object) independent of a state of phenotypification, we have to assume all possible connections between signifiers on the one hand and signifieds on the other hand to be relevant at the same time – this is due to our inability to tell which linguistic information really is relevant for a linguistic sign without phenotypificating it. This state can be called a "state of *superposition*" (as adapting a quantum physical term) (see chapter 2.3).

Such a broad understanding of linguistic superposition can be interpreted as a claim that language has to be regarded as just one single sign (see the "Single Sign Theory" (SST) introduced in chapter 2.6) taking new shape each time it is used – this sign can be identified to be the constant set we called "linguistic genotype".[6] To make such an assumption helpful, one could now use the already

5 Although this book focusses on human natural language, the introduced model is generally open to non-human phenotypificators as, for example, an AI that is capable of using languages as humans do – although such an AI does not exist yet, it should still be in consideration when we work on general language theories or models as the one introduced here.

6 It is worth mentioning that the fact that we assume every linguistic information that can be part of a signified to be part of the linguistic genotype does not necessarily mean that language is capable to cover all possible meanings in the world. So the linguistic model of recessivity regards language as a communication system – or more general: information (transmitting) system – with some characteristic purposes and abilities. Language shall not be misunderstood as a system to express meaning per se. This is why we could, for example, argue that emotional meanings cannot

introduced probabilistic approach: A linguistic sign – free of a state of phenotypification – consists of both a set of signifiers and a set of signifieds plus a probability distribution. This means that every combination of a signifier (i.e. an element or a subset of the set of signifiers) with a signified (i.e. an element or a subset of the set of signifieds) has a certain probability (and the probability distribution represents all of those probabilities); such a probability depends on the context of each phenotypification. Nevertheless, those probability distributions are – due to synchronizations as described by Herrgen and Schmidt (2011) – stabilizing on a collective level, notwithstanding that full stability is reached. If we define a certain signifier, all linguistic information that is information that can be part of a signified is superposing; if we define a certain signified, all linguistic information that is information that can be part of a signifier is superposing – only if we phenotypificate the whole sign (which we obviously will do by thinking about it[7]), the sign can reach a stable state. Superposing information can be weighted corresponding to the underlying probability distributions representing their probability to be phenotypificated.

Adopting the model of synchronizations by Herrgen and Schmidt (see chapter 1.5.2.3) we can identify linguistic systems on a collective level as being abstract and above all temporary. In order to communicate, two linguistic systems on individual level synchronize with each other, generating a linguistic system on a collective level, which exists only during this synchronization. Nevertheless, this linguistic system on collective level can transform the linguistic systems on individual level (which synchronize the linguistic system on collective level) by leaving information about how the communication worked in them: It could i.e. cause changes within the probability distributions regarding possibilities of phenotypifications for certain triggers; those changes can affect one or both of the systems on individual level involved in the synchronization and are especially related to the question whether the communicating individuals regard their communication as successful or not. This "footprint" a linguistic system on collective level might leave in linguistic systems on individual levels can be understood as a linguistic *image* and the process leading to this can be called "*imaging*". The fact that we can describe linguistic systems on an collective level like English or German proves that such images are very strong in determining the probability distributions within linguistic systems on individual levels (therefore, they have

always be expressed using language, which might be the reason for humans to sometimes feel that they cannot express their feelings with words.

7 This is why linguistic superposition will only be relevant for theoretical approaches and to get a better understanding of the "core" of language.

a great influence on upcoming synchronizations; although they are built up "bottom up", they develop effects in a "top down" manner). But, as already said, linguistic systems on collective levels are considered to be abstract and model-like for they simplify the complex mechanisms of synchronizations; the only way we can get a hold of them is by describing them and their effects as images on individual levels. There is no physical memory of such systems on collective levels, but the physical memory the systems of individual levels provide (i.e., for example, the relevant neural structures in a human brain).

This is why the "genotype" of linguistic systems on collective levels is in fact only a subset of the "real" linguistic genotype we can find on individual level. A linguistic system on a collective level depends on synchronizations and the linguistic elements that get phenotypificated and conventionalized during such synchronizations. So there is no constant genotype on a collective level and, therefore, the *Single Sign Theory* can only apply to linguistic systems on individual level (which are by no means considered to be abstract).

Let us now come back to the initially mentioned phenomena from the history of the German language, which we now want to describe in accordance to the linguistic model of recessivity. The first example of a "recessive pattern" was found in the development of Proto-Germanic **auke* 'and' to Old High German *ouh* 'also, too' that later appears in the High German dialect of Transylvanian Saxon as *auch* 'and'. The second example was found in the dativus absolutus in Old High German which is usually construed to be a syntactic loan of the Latin ablativus absolutus: It is assumed that it was not originally an Old High German construction, although there is evidence that a corresponding construction already existed in Proto-Germanic.

Let us assume that there actually was a continuity from Proto-Germanic to Old High German and from Old High German to Transylvanian Saxon (the assumption of these continuities is widely accepted in linguistics). Such a continuity can only be understood as a great number of different individuals that continuously synchronized their linguistic systems on individual levels from Proto-Germanic times up to the times of Transylvanian Saxon, i.e. for several generations. The synchronizations these individuals take part in left images of the (abstract) linguistic systems on collective level in their linguistic systems on individual level meaning that the linguistic metainformation they carry got adjusted with presumably every synchronization (i.e. especially the probabilities of phenotypification corresponding to the elements in the linguistic genotype that were phenotypificated). The "language change" classical linguistics would describe for this period (covering approximately two thousand years), can therefore not be

understood as a change in the actual linguistic information in linguistic systems, but in the average "cocktail" of linguistic metainformation that the carriers of linguistic systems – i.e. human beings – on individual level are provided with.

So according to the linguistic model of recessivity we can explain both phenomena in a similar way. The linguistic information of Transylvanian Saxon *auch* consists of a signifier for which individuals that are supposed to be part of the Transylvanian Saxon speech community normally carry the metainformation of a high probability of phenotypification for the form *auch*, while individuals that are supposed to be part of the Proto-Germanic or Old High German speech community will carry higher probabilities for the phenotypification of **auke* (Proto-Germanic) and *ouh* (Old High German). The linguistic information of the signified corresponding to this signifier also depends on such probability distribution; so we can assume that the probability for a meaning in the sense of 'and' to be phenotypificated as quite high for individuals that are supposed to be part of the Proto-Germanic or the Transylvanian Saxon speech community, whereas this probability is significantly lower for those that are supposed to be part of the Old High German speech community. But the linguistic information itself was never fully lost; it remained recessive for a long period (and/or had a high probability to stay recessive).

These assumptions can be applied to the case of the dativus absolutus in Old High German as well. We can claim that this construction never got lost (i.e. it was always present in the – constant(!) – linguistic genotype), but its probability to be phenotypificated was fluctuating. If we assume that this probability increased in Old High German times in the linguistic systems of individuals that are supposed to be part of the Old High German speech community, then we can by no means claim language contact with Latin to be responsible for the existence of the underlying linguistic information of the dativus absolutus (because – again – the linguistic genotype is a constant set). But nevertheless, we can still assume this language contact to be relevant by arguing that the contact with the linguistic system of Latin transformed the metainformation of Old High German speaking individuals regarding the probability of phenotypificating a dativus absolutus.

So the linguistic model of recessivity suggests a new perspective on so-called "loaning" in linguistics: It is assumed to be more about processes of transmitting linguistic metainformation than transmitting linguistic information itself. The underlying conviction can be shortly summarized as the assumption that it is always more effort required to generate or include new information in a system than to only rearrange the inner structure of a system such as a "re-weighting" of the connections between the system's elements. Therefore the assumption that

loaning only transmits linguistic metainformation regarding probability distributions within in the target system[8] describes more effective and more economical processes than the assumption that new linguistic elements are transmitted into a prevailing linguistic system by loaning does. This is why the new perspective on loaning suggested here is in stronger accordance with logical and physical principles of economy (furthermore, such claims and assumptions are also fundamental for optimality theory and the minimalist program, which are linguistic approaches the linguistic model of recessitivity is not part of; but there is, however, a connection between those three approaches with respect to their formalizing aspects and natural scientific claims and convictions).[9]

All in all, the linguistic model of recessivity was originally inspired by linguistic phenomena that are reminiscent of recessivity in genetics, but it is neither a biological or genetic approach to linguistic systems. Instead, linguistic systems are understood in an information theoretical and systems theoretical way. The linguistic model of recessivity is a probabilistic information model that allows us to describe and to analyze core aspects of linguistic systems in a formalized manner. The idea is to provide a precise theory that can cover linguistic systems no matter if they are natural or artificial linguistic systems. This is why the introduced model might also find its use in theoretical aspects of the development of new NLP ("Natural Language Processing") technologies.

For the English speaking reader I furthermore provide short abstracts of the main chapters of this book (following this introduction) as well as an English glossary that can be found in the "Anhang" (≙ 'appendix').

0.2 – Abstracts of the Chapters of this Book

The following English abstracts of the chapters of this book do not aim to provide a complete overview of the chapters, their content, and the included linguistic discussions, but to provide English speaking readers with the information they need to know which parts of the book might be especially relevant for their individual interests.

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8 I.e. the linguistic system "loaning" from another.

9 Regarding the logical problems of the concept of loaning as it is described in classical linguistics see the chapters 2.1.3, 3.1 and 3.3.

0.2.1 Abstract of Chapter 1

('Introduction')

Chapter 1 is above all an introduction. First of all, the linguistic issue regarding Transylvanian Saxon *auch*, as mentioned above, is discussed to show some of the problems classical linguistics has to explain the "recessive-like" pattern we observed. This leads to a discussion of the concept of recessive inheritance in genetics and its parallels to our linguistic observations. We then suppose these parallels to lie in the informational fundament of both biological and linguistic systems leading to the need of an information theoretical and systems theoretical approach to linguistics in order to explain our observations. We then aim to provide such an approach and its fundamental terminology; we define terms like the *linguistic genotype* and the *linguistic phenotype*, a general – information theoretical – *recessive pattern*, and our understanding of terms like *phenotypification*, *mental lexicon* or *lexicalization* within this book. Beneath the discussion of relevant terms from biology and genetics, some neuroscientific definitions (of terms like *perception* or *thought*) are necessary as well. We also recapitulate general systems theory and their adaption to linguistics meeting, for example, the model of synchronizations by Herrgen and Schmidt (see Herrgen/Schmidt 2011). We also take a look at linguistic approaches of the past, especially regarding language change or evolutional linguistics. It becomes obvious that the distinction between linguistic systems on individual levels and on collective levels will be highly important for the further development of the linguistic model of recessivity. The model needs to focus on the individual level, but keeps in mind the collective one as well as neural aspects of (human) cognition. The model to be introduced in this book is an information theoretical and systems theoretical approach to language.

0.2.2 Abstract of Chapter 2

('The Theory of Recessive Information in Language and Where Such Information Can Be Stored')

In searching for "recessive information" in language, we have to find plausible explanations of where this information can be located within linguistic systems. This leads to comprehensive analyses of a huge variety of linguistic aspects such as phonology (see chapter 2.2), morphology, syntax (see chapter 2.4), and especially lexicology, word formation, and semantic relations (see chapter 2.1). These

analyses are the core of chapter 2. We take a look at those aspects in detail by keeping track of diachronic developments as well as synchronic observations; we discuss the different concepts of linguistic innovation, language change, and borrowing, and argue that linguists need a new perspective with regards to the underlying information theoretical impacts of those phenomena. Doing this, we get a better understanding of both the linguistic phenotype and the linguistic genotype, which finally leads to the introduction of the concept of linguistic superposition (see chapter 2.3) and the Single Sign Theory (SST) (see chapter 2.6). We then discuss "external" linguistic stores such as linguistic information written on a piece of paper or saved as a digital audio recording (see chapter 2.5, where we also meet with the *extended phenotype* by Dawkins (see Dawkins 1999)). In reference to some examples from the history of the German language we can assume that such "external" linguistic stores can also affect the probabilities of phenotypification of the linguistic elements in linguistic systems, and thus can affect phenomena like the ones classical linguistics subsumes under "language change".[10]

0.2.3 Abstract of Chapter 3

('Evidence for the Keeping of Recessive Information from the History of German and the Use of the General Pattern of Recessivity')

As our observations in chapter 2 lead to a deeper understanding of linguistic recessivity, chapter 3 focusses on three examples of a (general) pattern of recessivity (which was defined in chapter 1). Those examples are taken from the history of the (High) German Language and are discussed in detail: First we take a comprehensive look at Transylvanian Saxon *auch*, then we focus on the development of the so-called *werden*-future (a syntactic construction used to express future tense with the help of the auxiliary verb *werden* (≙ 'to become'), and finally we have a look at the dativus absolutus and its possible origin in Old High German. Analyzing these aspects in a diachronic way, we deduce the capability of the linguistic model of recessivity to explain those phenomena in a more formalized way than classical approaches did. Furthermore, the informational prerequisites that a linguistic system and the linguistic processes in question have to provide are far more complex for classical linguistics; this proves the model of

[10] An example is the revival of the Middle High German word *minne* in the early 19th century, when German authors used to glorify the middle ages and found – and then revive – *minne* in old manuscripts (see chapter 2.5).

recessivity to be superior, as it is more in accordance with state-of-the-art approaches like e.g. optimality theory, biolinguistics, or minimalist approaches, and therefore backed up by natural science like physics.

0.2.4 Abstract of Chapter 4

('Excursus: Ergativity and the Model of Linguistic Recessivity')
As chapter 2 and 3 focus mainly on the (High) German language in both a synchronic and a diachronic way, chapter 4 aims to test the linguistic model of recessivity on Non-Germanic and also Non-Indo-European languages. Therefore, we have a look at ergativity. We start by introducing the concept of ergativity and having a look on the different types of ergativity in the languages of the world. We then analyze indications of alignment changes in language history by connecting corresponding works, e.g. regarding the Polynesian languages or the development of split ergativity in Iranian languages. Using those insides and a mathematical approach we can conclude that ergativity can also be considered to be part of the linguistic genotype. A small case study also provides evidence that we can assume "weak" forms of ergativity not only to be recessive in Modern High German, but also to have a corresponding probability of phenotypification that makes ergative-like constructions easy to understand for speakers of German in some contexts, although German is not considered to be an ergative language at all (furthermore, there is no evidence for ergativity in the history of the Germanic languages at least since Proto-Germanic times).

0.2.5 Abstract of Chapter 5

('Summary, Conclusion, and Outlook')
Chapter 5 consists of a summary of the previous analyses. It also aims to further integrate the established model in a broader context. We discuss similarities and differences between the linguistic model of recessivity and both linguistic optimality theory and the minimalist program (see chapter 5.1). In doing so, we also describe the processes of "language production" and "language perceptions" in accordance to our model (it is e.g. suggested to replace those terms with *genesis of a signified* (triggered by the physical stimulus of a signifier) and *genesis of a signifier* (triggered by a signified)) (see chapter 5.1.1). We then discuss the impact

the linguistic model of recessivity has with regards to our perspective on the existence of so-called "macrofamilies" or the origin of human language. In this discussion we meet with, for example, the theories of monogenesis and polygenesis (see chapter 5.3). Finally, we discuss the relation between the linguistic model of recessivity and certain assumptions from other natural sciences like biology or physics. It becomes clear that the linguistic model of recessivity is restricted to linguistic systems, but not only to linguistic systems we find in *Homo sapiens* (see chapter 5.4). This model introduced here will also be capable of providing insights to non-human linguistic systems, such as (in the future) for example AIs or perhaps even other species (no matter if their origin is earth or not) – of course, this does not mean, that there will be no adjustments necessary in the future; but the basis of the linguistic model of recessivity is an information theoretical and systems theoretical and therefore it is proven to be more flexible than language models introduced in classical linguistics (as shown by the analyses in this book).

0.2.6 Abstract of Chapter 6

('Addendum: The Benefit of Comparing Recessivity in Language with Recessivity in Biological Systems')

Chapter 6 is not necessarily considered to be part of the introduction to the linguistic model of recessivity; it is an addendum. The main purpose of this chapter is to discuss the claims of some linguists that language is a living being, an organism (see e.g. Driem 2003, 2008, 2015). It is argued that those approaches usually seem to consist of (at least some) esoteric aspects, but, however, are plausible to some degree. Nevertheless it seems to be more plausible not to describe languages as organisms in a biological sense, but to argue that there is an intersection: Both languages and biological organisms can be understood as having a common basis, which is that they are both built upon or built as an informational system (i.e. both can be described in accordance to systems theoretical aspects and both work on, transform, or transmit some kind of information).

0.2.7 The Content of the “Anhang” (≙ ‘Appendix’)

The “Anhang” is the appendix of this book and provides additional information. First of all, there is the dictionary-like glossary, where concise definitions of the special terms used in this book for the linguistic model of recessivity can be found. This makes it easy and fast to look them up and allows a more comfortable work with the model and its theory. The glossary can be found in both German (chapter A.1) and English (chapter A.2) making those central information accessible for (nearly) everyone who is interested. Furthermore, the appendix provides a chapter with some basic formalizations of the model (chapter A.3), some remarks to the case studies included in this book (chapter A.4), and a list of abbreviations (chapter A.5). Finally, you can find the bibliography listing all works cited in this book (chapter A.6).