

# **THE THESES OF THE PHD DISSERTATION**

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## **The Analysis of The Argumentational Structure of Linguistic Theories**

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## 1. Objectives of the dissertation

Linguists often have to face the problem that the theories they apply require them to come to conclusions which **conflict** with their own linguistic intuitions. The reverse can also occur: often the linguist decides to **infringe** the meta-scientific principles laid down by the theory so that the linguistic data can be described in such a way that it fits his or her intuitions. For example, he or she may accept (at least temporarily) a hypothesis for which there are counter-examples, although the methodology which he/she has chosen requires that there be consistency between the hypotheses of the theory and the linguistic data. This should motivate us to discover the nature of the activities which **linguists carry out during scientific theorizing** and to **confront it with the meta-scientific (methodological) principles** which the given linguistic theory lays down for them, either explicitly or implicitly.

However, the task in this form – as a completely general undertaking – is obviously unachievable; we must therefore **narrow down** our field of enquiry to a carefully selected group of metascientific principles and linguistic theories. Consequently, we will focus on the **techniques of reasoning** and the **meta-scientific principles** which relate to them in two theories which have been created (at least partly) within **generative linguistics**.

The meta-scientific framework accepted without reservation by generative linguists and many cognitive linguists who follow the methodology of the generative grammar has remained within the boundaries of the **received view of the analytical philosophy of science** and contains, among others, the following elements:

- (TA) (a) There are **deductive** inference relations between the hypotheses of empirical linguistic theories.
- (b) Hypothesis systems which are **inconsistent** with linguistic data cannot be accepted even provisionally.
- (c) The **contexts of discovery and justification must be rigorously separated from each other**, since only justification is accessible to rationality.

These concepts can be contrasted with the following hypothesis:

- (TP) (a) Relevantly, there are **plausible** inference relations between the hypotheses of empirical theories.
- (b) In most cases the structure of empirical linguistic theories contains **inconsistent** elements as well.
- (c) The **contexts of discovery and justification cannot be separated from each other**: we have to carry them out using the same tools and in the same epistemological situation. Thus the exposition of linguistic theories is essentially **argumentative**.

We could decide between (TA) and (TP), balancing all the principles which **in the philosophy of science** are arrayed in support of, or in opposition to the two standpoints. However, we will choose another route, precisely in the spirit of the changing viewpoint which emerged in the latter half of the twentieth century. Our aim is not simply to criticize the received view of the analytical philosophy of science and to replace it with another metascientific model but also to confront the methodological views of the **linguists** who work in the spirit of the standard view of the analytical philosophy of science and accept (TA) as a methodological framework either consciously or in an unreflected way with the argumentative aspects of their object-scientific activities.

Therefore, we would like to demonstrate the following:

- (H) (a) The **argumentational structure of the analyzed theory-fragments significantly diverges** from the prescribed norms laid down in the meta-scientific framework behind these theories; in other words, **they do not fulfil (TA)**. At the same time **the reconstruction of the techniques of reasoning actually employed by linguists** shows that they operate during their object-scientific activities, without reflection, **in the spirit of (TP)**.
- (b) From the analysis of the **techniques of reasoning actually employed** in these theories, experiences can be gained the **conscious use** of which the effectivity of linguistic inquiry could increase. That is, this kind of metascientific reflection is **constructive regarding the object-scientific activity**.
- (c) However, the methodology worked out on the basis of these experiences is inevitably the object of **continuous correction**, that is, its application is **constructive** not only **from the viewpoint** of the object- but also **of the metascientific theorizing**.

We will demonstrate (H) **not only with arguments from the philosophy of science** but also we will try to support it with the help of two **case studies**. This way, **continuously correlating** the metascientific considerations with the results gained by the analysis of object-scientific theories we provide an opportunity to avoid the hazards the application of a strongly normative methodology may lead to. Such methodologies can be characterized by the fact that they have been worked out solely on the basis of meta-theoretical considerations and that they disregard the practice of scientific research.

## 2. Applied methods

The dissertation is aimed at the **investigation of the methodological problems** in connection with the argumentation theoretical analysis of linguistic theories and the **elaboration and testing of a methodological framework** with the help of which the argumentative techniques employed during scientific theorizing can be revealed.

In this metatheoretical framework we will interpret the argumentations of non-formal theories as **heuristic tools**, and we claim that non-formal theories relevantly employ **plausible inferences**. The main characteristic of plausible inferences is that on the basis of the information of usually uncertain truth value we possess they make it possible to gain further information, i.e. which has not been contained in this set of information implicitly. The paradigm example of plausible inferences is **reduction**:

$$\frac{\text{If } A, \text{ then } B}{B \text{ has become certain}}{\text{A has become more credible}}$$

An important characteristic of plausible inferences is that they can help us handle the informational under- and overdetermination, thus they can be suitable tools for the resolution of inconsistencies emerging in scientific theories. However, their use needs caution and careful consideration: despite providing us with new information they do not guarantee the certainty of their conclusion, they only make it **more credible**. New information may abolish these conclusions at any time. Still, plausible inferences are entirely **rational**, because they

tell us whether the credibility of a conjecture has been increased on the strength of the information available at the given moment.

The **methodological framework**, which can replace the methodology of the received view of the analytical philosophy of science, is built on the use of plausible inferences. As a result, we can arrive at a metatheoretical background which takes into account the peculiarities of the object-scientific activities to a larger extent, extends over a more considerable part of it and does not give up normativity.

This model divides the process of scientific argumentation into **reasoning cycles** and imagines these cycles as a **double helix**.

One of the helices aims at the **control of the internal coherence**, in so far as we verify whether the new hypotheses gained from the members of the partial basis with the help of plausible inferences are consistent with the other claims of the theory. The other helix serves for the **control of external coherence**, i.e. verifying whether our theory makes correct predictions. If the outcome of the tests is negative then we have to ponder which hypotheses could be given up to arrive at a consistent set of data. The decision between the possible alternatives is made with the aid of plausible inferences again, and an important factor of this process is to keep a balance between the effort to consistency and the effort to take into consideration as much information as possible. There is indeed no guarantee that we are successful and we can resolve the inconsistencies in an unambiguous and satisfying way; it may occur that while we do away with inconsistency at one point of the theory, another one comes to exist at a further point, which we can try to resolve during newer reasoning cycles and so on. Consequently, scientific reasoning is not only cyclic but **prismatic** as well: during the cycles we always consider our data from another point of view: On the one hand, we obtain new hypotheses which have to be taken into account, and on the other hand, we always ponder over the consequences which we obtain if we give up different background assumptions.

According to these ideas **the contexts of discovery and justification cannot be separated from each other** because we accomplish them with the same tools and in the same epistemological situation: analyzing the argumentational structure of the object-level theory (in this case theory-fragments) we point out that they reason using plausible inferences, cyclically and prismatically; on the other hand, **the meta-level reflection** which analyses and continues these argumentations on the meta-level, is built on plausible inferences and goes on cyclically and prismatically as well.

The methodology of the cyclic argumentation is **reflective** as well since we work out the tools of the metascientific reflection this way in the parts I-IV. of the dissertation; finally, we can **reach the moral from the meta-level reflection and solve the problems** with the same tools as well.

### 3. Results

**In Part I** we summed up the characteristics of **the relationship between the metatheoretical reflection and object-scientific research**. We motivated the legitimacy of the metascientific reflection among others in a way that the object-scientific research often uses metatheoretical views or certain elements of them in an unreflected and naive way. We came to the conclusion that we can reach results which are constructive in respect to both domains (i.e. which contribute to the solution of problems arising on the given scientific domain) only by continuously correlating these two perspectives with each other. At the same time, we emphasized that the metascientific reflection cannot give us a method which could be used in all situations universally but it has to confine itself to two things: firstly, gaining experiences from the study of typical object-scientific problem-situations; secondly, after generalizing

these experiences working out a methodology that can be tested and modified with the help of case studies on the other. In this spirit we aimed at the analysis of the argumentational structure of two linguistic theory-fragments, by investigating first of all why contradictions in the theories emerge and how they are treated. This “how” related to the analysis of the techniques of reasoning actually employed and to the methodological prescriptions which the methodology of the given theory contains.

From the view point of the metascientific reflection, the constructivity of this kind of argumentation theoretical analysis lies above all in the fact that it results not in a methodology that has been worked out solely on the base of metatheoretical considerations and that is consequently strongly normative and thus unrealistic. Namely, if the acceptability of the techniques of reasoning applied in the object-scientific theories is not decided on the strength of formal criteria alone: we scrutinize their heuristic potential taking into account the peculiarities of the given context, then we can provide an opportunity for drawing the line between acceptable and unacceptable arguments in a way that we do not neglect the peculiarities of the given area of science and in addition, we do not give up the demand on normativity either. From the view point of the object-scientific activities, the source of the constructivity is twofold. On the one hand the theory of plausible reasoning and the methodology based on it cover a much broader area of scientific theorizing because they do not exclude the context of discovery from their competence. On the other hand they make it possible to avoid the problems which the unreflected and/or inconsequent application of a methodology, has been regarded as outworn in the philosophy of science, can lead to. A further important source of mutual constructivity is that we do not treat the methodological framework presented in chapters 9 and 10 as a dogma but we are trying to modify and correct it continuously in the light of the experiences which can be gained by its application in the case studies.

**In Part II** we outlined the **philosophical and argumentation theoretical background** of the metatheoretical view (TA), which most linguistic theories after the appearance of the generative grammar accept. The **standard view of the analytical philosophy of science** rests on two inseparable fundamental assumptions: on the one hand, it does not deem non-conclusive inferences rational, on the other hand, scientific theories must not contain contradictions. Since only conclusive inferences are able to guarantee and control the consistency of a hypothesis system, scientific theories cannot contain non-conclusive inferences or they can employ such inferences solely non-constitutively. This forces us to exclude the process of theory-construction (context of discovery) from the scope of the meta-level reflection and to investigate only its end-product (context of justification). Consequently, according to this view, the investigation of the argumentational aspects of scientific theorizing is a useless and senseless enterprise.

We found the argumentation theoretical roots of this view in the Aristotelian paradigm, which is built on a certain interpretation of ARISTOTLE’s views and intensifies and what is more, makes some tendencies of ARISTOTLE’s work exclusive. The core of this paradigm is the idea that there is no need for the investigation of the process and context of the argumentation because it is enough to reveal the logical structure of the end-product of the argumentation. Although the standard view of the analytical philosophy of science does not accept the element of the Aristotelian paradigm according to which the rules of creative thinking are identical with the rules of logic, it admits and continues many important elements of this tradition; among these, for example the thesis, that non-conclusive inferences have to be declared fallacies, and the only possible standard of arguments is deductive logic.

**In Part III** we presented **approaches which criticize the Aristotelian paradigm**. In the second half of the 20. century the fundamental assumptions of the Aristotelian paradigm were questioned and rival hypotheses were put forward regarding some aspects of argumentation.

The attempts made by argumentation theory could achieve only partial results. These partial results were still significant because they unanimously pointed into one direction: on the one hand, argumentation theory has to get rid of the Aristotelian paradigm which proclaims the exclusiveness of formal logic and on the other hand – departing from ARISTOTLE again – it has to rethink the relationship between logic and argumentation. This took place in connection with everyday argumentation; however, in the case of scientific reasoning there was no breakthrough. This ambiguous situation can be illustrated properly by WALTON's attitude: he acknowledges the rationality of plausible inferences in everyday argumentation and in many other areas (e.g. legal reasoning) as well, but in science he permits their use only at the discovery stage, since they do not meet the standard of rationality that deductive inferences do.

In connection with the argumentational structure of scientific theories the decisive turn took place in the philosophy of science. This turn was due to the paradigm shift which emerged first of all relying on the work of KUHN and NICKLES. One of the most important results of this paradigm shift was the abandoning of Reichenbach's dogma about the separating the contexts of discovery and justification. Moreover, it has become clear that we should not interpret scientific theories as sets of statements organized to a deductive system but as stages of the problem solving activity. Consequently, we should not narrow down metascientific reflection to the analysis of the products of the scientific theorizing disregarding the context but our subject matter should be the process of problem solving and we have to pay attention to every factor that can influence its effectivity.

**Part IV.** outlined the **philosophical and argumentation theoretical background of (TP)**. First we summed up the consequences arising from the inseparability of the contexts of discovery and justification relating to the the argumentational structure of empirical theories. These consequences lie first of all in the fact that informal theories use non-conclusive inferences in a constitutive way as well. However, this can lead to the emergence of inconsistencies that we can try to resolve employing non-conclusive inferences again.

This means that we need tools with the help of which plausible inferences can be described and analyzed. In favour of this we came back to ARISTOTLE and saw that there is another paradigm showing up against his works as well. We called it **Topics-paradigm** and whose presence can be shown clearly in the whole œuvre of ARISTOTLE. An essential element of the Topics-paradigm is that the system of syllogisms cannot be considered as formal logic in the modern sense but we have to interpret these inferences as plausible argumentation which takes into account content aspects as well. *Topics*, the two *Analytics* and *Rhetorics* all investigate – from different points of view – which characteristics the individual methods of reasoning have, what their relevant aspects are which should be taken into consideration during their analysis, and what connections they have to the assertoric and modal syllogisms. We arrived at the conclusion that syllogisms are not the absolute standards of arguments but they are ideals which can be reached only in a very narrow domain, i.e. in the realm of necessity; at the same time, they set the limits of argumentations applicable on other areas.

Another important characteristic of the Topics-paradigm is that it initiates the cognitive sphere into the argumentation analysis. So, our next step was seeking the way the results of **cognitive psychology** could be integrated into models of argumentation. We found that a cyclic and prismatic reasoning process could be able to reconcile the results which can be gained from the study of the argumentation process, of the product of the argumentation and the cognitive processes accompanying the argumentation respectively.

After this, taking GEORG POLYA's and NICHOLAS RESCHER's ideas as our starting point we worked out the tools which make us possible to grasp the argumentative aspects of scientific theorizing, whose most important characteristics we outlined in section 2.

Then we attempted to **draw the dividing line between plausible inferences and fallacies**, because without this we could not have claimed that (TP) includes normative elements as well and our whole enterprise would go astray. As a result of our considerations we reinterpreted the relationships between conclusive, plausible and fallacious inferences. We argued that from an epistemological point of view plausible inferences have to be considered primary and we can treat conclusive inferences and fallacies as extreme cases of plausible inferences. Further, this result is important because it fits into the Topics-paradigm perfectly.

**Part V.** was devoted to two case studies. In the first one we showed that the Standard Theory of generative syntax does not proceed in practice following the prescriptions of the standard view of the analytical philosophy of science, i.e. in the spirit of (TA), but in an irreflected way in accordance with (TP). Thus, **we have reinforced (H)(a)**. We have also seen, that CHOMSKY and ROSS did this without being in possession of a coherent and elaborated metascientific view with the help of which they could have created a more realistic concept about their activities.

The first case study provided us with a further argument for the hypothesis that metascientific reflection and object-scientific activity cannot be isolated from each other. One reason for this is that object-scientific argumentation contains metascientific elements as well; besides, the metascientific cycles utilized object-scientific argumentation. That is, these two perspectives alternate with each other continuously during the activities of the linguist and during the metascientific reflection as well.

The second case study was destined to enhance the plausibility of **(H)(b)**. We tried to support (TP)'s constructivity in a way that first we reconstructed the argumentation in WURZEL (1981) in object-scientific cycles, and then in meta-scientific cycles we attempted to find better alternatives which remained within the boundaries of the given theory. Both case studies motivate a further argument for the constructivity of the kind of metascientific reflection we have chosen as well: if we give up the prescriptions of the standard view of the analytical philosophy of science and follow the methodology of the cyclic and prismatic reasoning we can on the one hand handle inconsistencies in a conscious and reflected manner and on the other hand, we dare publish hypothesis systems which are known to be inconsistent but on the basis of the data we possess are better than all the other alternatives. Moreover, newer attempts initiate new hypotheses, new examples and counter-examples into our investigations that invite us to further unexplored areas. Since the new examples might suggest other analogies, the analogies between the counter-examples give rise to other kinds of prohibiting rules and so on – the information at our disposal grows and grows, although it doubtlessly consists of hypotheses of uncertain truth value.

**In Part VI.** after having summarized our results we considered in which directions the employed methods could be developed and what can impose restrictions on our efforts. This means that we took steps for the acceptance of (H)(c). We do not want to treat the methodology we have put forward as a dogma but we want to use it in a reflected way. That is, we wish to remain open-minded for all problems which emerge during the application of our method and the solution of which may lead to an improvement of our ideas. For example, in the two case studies we did not confine ourselves to the reconstruction of the given theory's heuristics but we reflected upon the results of these reconstructions in metascientific cycles. The question arises, how can we know that our proceedings have been constructive, i.e. that they have contributed to the more effective solution of the given object-scientific problems. We have to say that there is no guarantee for this. The person who carries out the meta-level reflection has more or less **uncertain background assumptions** as well, he/she can reason only from a **partial basis**. Accordingly, a multitude of possibilities can reveal themselves. The decision between them can be reached **heuristically** again and can be put under the microscope during a newer cycle and so on. Consequently, the evaluation of theories is

carried out **with the application of plausible inferences, cyclic and prismatic reasoning**. This means that the meta-scientific reflection does not lead **automatically** to better solutions but it increases the **chance** that we can find them.

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