

The uncertainty of syntactic theorizing

András Kertész
Csilla Rákosi

Abstract

In this paper, we present a metatheoretical model and show how it serves to capture some basic properties of generative linguistic theorizing. By ‘generative linguistic theorizing’, we mean *actual research practice*, i.e. research activities performed while elaborating, putting forward, applying, and testing particular versions of generative linguistics. We call our metatheoretical approach *the p-model* of plausible argumentation. With the help of the p-model, we will show that the way in which generative linguistics has proceeded over the past decades and is functioning today differs significantly from the self-image of generative linguists as documented in the literature. Thus, we will show that generative linguistic research is built on uncertainty rather than certainty; it tolerates inconsistency instead of defending consistency at all costs; the structure of its theories is not static, but dynamic; and its development is not linear, but cyclic and prismatic.

1. Introduction¹

In (1) we quote *Syntactic Structures* in which Chomsky characterizes a grammar in the following way:²

- (1) (a) A grammar of the language L is essentially a *theory* of L.
- (b) Any scientific theory is based on a finite number of *observations*, and it seeks to relate the observed phenomena and to *predict* new phenomena by constructing *general laws* in terms of *hypothetical constructs* such as (in physics, for example) ‘mass’ and ‘electron’.
- (c) Similarly, a grammar of English is based on a finite corpus of utterances (observations), and it will contain certain grammatical rules (laws) stated in terms of the particular phonemes, phrases, etc., of English (hypothetical constructs). These rules express structural relations among the sentences of the corpus and the indefinite number of sentences generated by the grammar beyond the corpus (predictions). Our problem is to develop and clarify the criteria for selecting the correct grammar for each language, that is, the correct theory of this language. (Chomsky 1957: 49; emphasis added)

¹ Two terminological remarks should be made in order to avoid any misunderstanding of the subject matter of this chapter. First, the term ‘generative linguistics’ is ambiguous because it may refer to a series of theories, approaches or models, some of which compete with each other. Second, we do not go into the discussion of whether particular versions of generative linguistics are ‘theories’ or ‘programs’, etc. We will see that from the point of view of the p-model these notions are not crucial.

² We have subdivided this quotation into units in order to make references to relevant parts of the quotation easier.

Although Chomsky does not cite the literature which the ideas summarized in this passage are based on, it goes without saying that the terms introduced in (1)(b) have been borrowed from the standard view of the philosophy of science. Basically, the standard view of the philosophy of science consisted of two main branches, namely *logical positivism* (whose most prominent personality was Rudolf Carnap and which was based on the inductive method) and Popperian *falsificationism* focusing on the deductive testing of scientific theories (for an overview of the standard view see e.g. Hung 2014: 311). Besides their differences, these two branches share a set of common features, the most important of which is the assumption that there are criteria of rationality that any kind of scientific inquiry should meet. (1)(b) is a concise summary of the picture which the Popperian deductive branch of the standard view of the philosophy of science drew of successful physical theories. (1)(a) and (1)(c) conceive of grammars in analogy to this account of scientific theories. Nevertheless, as later developments witness, the relation between grammars and scientific theories in this sense seems to be quite challenging, both for linguists themselves and for philosophers of science as well for at least the following reasons:

(i) A great amount of the literature reflecting on the methodology of generative linguistics questions the successful realization of the project illustrated by (1). For example, Behme's (2014: 672) analysis concludes that Chomsky's "recent work fails to meet serious scientific standards because he rejects scientific procedure, inflates the value of his own work, and distorts the work of others [...]." Sampson goes a step further and assumes that "[...] linguistics will not move forward healthily until the generative approach is bypassed as *the pseudoscience it is*, with its remaining practitioners retiring from academic life and new recruits to the discipline ignoring its ethos, assumptions, and alleged results" (Sampson 2007: 122; emphasis added).

(ii) In contrast, other linguists still argue for the claim that the current version of generative linguistics "is well on its way to becoming a full-blown natural science, offering a serious promise of an advanced field of scientific inquiry whose idealizations, abstractions, and deductions will eventually *match in depth and subtlety those of the most advanced domains of modern science*" (Piatelli-Palmarini 1998: xxv; emphasis added).

(iii) While the standpoints in (i) and (ii) presuppose its correctness, the standard view has become obsolete in the current state of the art of the philosophy of science. Primarily as a result of Kuhn's and Lakatos' impact, today there is general consensus among philosophers of science that the standard view is unrealistic insofar as it is incapable of describing the history of science because no scientific theory put forward so far fulfils its norms. Therefore, it cannot be applied as a guide for the elaboration of new theories, either.

Comparing Chomsky's project as illustrated in (1) with the evaluations as exemplified above in (i)-(iii), the question arises:

(Q) What is the nature of generative linguistic theorizing?

It is this question which the present chapter focuses on. Nevertheless, we will take sides neither for the Chomskyan nor the anti-Chomskyan stance. Rather, we will outline a metatheoretical model which is crucially different from the standard view and which might be capable of capturing some basic properties of generative linguistic theorizing in an *unbiased and balanced* manner. By 'generative linguistic theorizing', we mean *actual research practice*, i.e. the research activities performed while elaborating, putting forward, applying, and testing particular versions of generative linguistics. We call our metatheoretical approach *the p-model* of plausible argumentation.³

³ See Kertész and Rákosi (2012) for a detailed presentation of the p-model and Kertész and Rákosi (2014) for its concise summary.

The p-model of plausible argumentation rejects, in harmony with current trends in the philosophy of science, a series of methodological prejudices which mainstream linguistics takes implicitly or explicitly for granted, but which are at variance with the research practice. The p-model answers the question (Q) by accounting for, among others, the following properties of generative linguistic theorizing:

- (P1) Generative linguistic theorizing is *based on the uncertainty of information* instead of its certainty.
- (P2) Generative linguistic theorizing *tolerates inconsistency* instead of requiring consistency at all costs.
- (P3) Generative linguistic theorizing is a *dynamic, cyclic and prismatic process* instead of being based on a static logical structure and resulting from a linear development.

In Section 2 we will elaborate on the properties (P1)-(P3) and put forward a series of theses which will jointly yield our answer to the question (Q). In order to keep our train of thought within reasonable limits and to show the overall workability of the p-model, in Section 3 we will illustrate the notions and the claims we introduce by a case study. We have chosen Zubizarreta's (1982) analysis of Spanish modal verbs which in the 1980s was considered a valuable contribution to Government-Binding Theory and which is, on the one hand, well suited to exemplify certain relevant features of generative linguistics. On the other hand, since Zubizarreta's analysis is out of date now, we will not be compelled to take sides in the acceptance or rejection of Government-Binding Theory as well as Zubizarreta's analysis; such a debate would blur the focus of a balanced metatheoretical approach. Finally, in Section 4 we will summarize our stance by comparing the p-model's theses to other metatheoretical approaches.

2. The p-model of generative linguistic theorizing

2.1. On property (P1): The uncertainty of information

2.1.1. Plausible statements

The literature that evaluates generative linguistic theorizing unanimously highlights the changing nature of its hypotheses, basic terms, and the details of the theoretical framework. Proponents of generative linguistics evaluate these changes as a progressive feature that speaks for its continuous development and renewal. In contrast, its opponents criticize it for not even being able to reveal a single rule or principle or term or anything else that has lasted over the six decades of its history. The motivation for these extreme evaluations is that the self-image of generative grammar is still based on the standard view of the philosophy of science. This means that, on the one hand, the search for the firm empirical basis of generative linguistic theories presupposed the certainty of data, the truth of the hypotheses, and the consistency of the theory; on the other hand, the practice of generative linguistic theorizing departs from these features insofar as most hypotheses are not statements the truth of which is guaranteed by empirical evidence or theoretical considerations. Therefore, one central task of any metatheoretical reflection on the nature of generative linguistic theorizing is to capture its *uncertainty*. However, although uncertainty is without doubt one of the constitutive properties of generative linguistic theorizing, the p-model does not deem this a shortcoming, but sets out to reconstruct it and to reveal the consequences it leads to.

The p-model explicates the notion of 'uncertainty' as 'plausibility'. Thus, we claim:

- (T)(a) The hypotheses which generative linguistics put forward – for example, rules, principles, constraints – are plausible statements.

A *plausible statement* is a pair consisting of an *information content* and a *plausibility value*. The plausibility value of a statement shows that one is ready to accept the statement on the basis of *sources* that support it and that are considered to be reliable to some extent; that is, the plausibility value of a statement is *source-dependent*. This means that a statement may be very plausible according to one source, and less plausible, or implausible, with respect to others. For example, the plausibility value of a statement asserting the grammaticalness of a given sentence of English may be judged differently depending on how reliable one considers the native speaker's intuition as a source. Those who accept, for instance, the view outlined in Sampson (2007) and Sampson and Babarczy (2014), would consider the intuition of the native speaker an unreliable source and would assign the statement claiming the grammaticality of a sentence a very low plausibility value or even no plausibility value at all.⁴ In contrast, generative linguists in the eighties and nineties would consider the intuition of the native speaker to be a highly reliable source which assures the high plausibility value of grammaticality judgments.⁵ And vice versa: linguists trusting intuition assign statements based on statistical data stemming from corpora a low plausibility value,⁶ whereas corpus linguists consider them highly plausible.

It may also happen that some sources support the negation of the given statement and make it *implausible*. Further, if several sources support a statement, then its plausibility value is higher on the basis of all sources together than its plausibility value on the basis of any of the sources alone.⁷

It is important to bear in mind that plausibility and (subjective or objective) probability are completely different concepts. For example, low plausibility values do not mean improbability. Even in such cases the source votes for the given hypothesis, although it provides only a weak argument for its acceptance. If a source is against a hypothesis, then it makes its negation plausible.⁸

To sum up, the plausibility value of the statement p on the basis of the source S is such that:

- (a) $|p|_S = 1$, if p is true with certainty on the basis of S ;
- (b) $|p|_S = 0$, if p is of neutral plausibility on the basis of S , i.e., if it is neither plausible nor implausible on the basis of this source (we can accept neither p nor its negation on the basis of S);
- (c) $0 < |p|_S < 1$, if p is plausible on the basis of S (i.e., we are ready to accept p on the basis of S);

⁴ "If linguistics is indeed based on intuition, then it is not a science [...]. Science relies exclusively on the empirical." (Sampson 1975: 60)

⁵ For example, according to Jackendoff (1994: 48), introspection "is *so reliable* that, for a very good first approximation, linguists tend to trust their own judgments and those of their colleagues" (emphasis added).

⁶ For example, Chomsky declares that "corpus linguistics doesn't mean anything" (Andor 2004: 97). Or, to quote Pullum, who in other respects is very critical of Chomsky's publications: "[...] corpus linguistics based on huge corpora has been gaining popularity as a methodology for syntax. But it will fail to have the effect it should on theoretical linguistics if its adherents fall into the extreme 'everything-is-correct' trap. [...] What, for example, is the point of the tendency seen in some grammars of the last ten years toward using corpus-derived examples for illustration? Why is it that some grammarians seem to think that every example in a reference grammar should come from a corpus? It seems to me it is not even generally desirable, let alone fully feasible." (Pullum 2017: 284)

⁷ Rescher (1976) and Kertész and Rákosi (2012) represent plausibility values numerically. However, these numerical values do not have any exact meaning which could be applied in every context, but merely indicate different *relative strengths* of plausibility (reliability, supportedness, acceptance) within one theory (argumentation process). The minimum value of plausibility is indicated by 0 which means that the given hypothesis is of neutral plausibility on the basis of the source at issue. The maximal value is indicated by 1, meaning that the statement in question is true with certainty on the basis of the given source. For the sake of simplicity of exposition, in the present chapter we will not differentiate plausibility ratings numerically.

⁸ For details, see Kertész and Rákosi (2012: 66) and Rescher (1976, Chapter IV).

- (d) $0 < |\sim p|_s < 1$, if p is implausible on the basis of S (S provides support for the negation of p – we can accept p 's negation on the basis of S).

We distinguish between direct and indirect sources. In the case of *direct sources* the plausibility of the statement at issue is evaluated with respect to the reliability of the source. Such direct sources are, for example, the linguistic intuition of native speakers, corpus data, whole publications, or even the authority of one person. With *indirect sources*, however, the plausibility value of the given statement is determined with reference to the plausibility of other statements – the paradigm cases of indirect sources are inferences, to which we turn next.

2.1.2. Obtaining new information from uncertain information: plausible inferences

Only deductive inferences the premises of which are true with certainty are capable of guaranteeing the truth of the conclusion. However, in generative linguistic argumentation, very often either there is no logical consequence relation between the premises and the conclusion (that is, the inference is not deductively valid), or at least one of the premises, instead of being certainly true, is only plausible in the light of the given sources. Moreover, the combination of these two cases may also occur. Although such inferences are not capable of securing the truth of the conclusion, they may – under appropriate circumstances – make the conclusion *plausible*. The next sub-thesis is (T)(b):

- (T)(b) The prototypical cases of the inferences applied in generative linguistic theorizing are plausible inferences.

Plausible inferences are mappings associating a set of plausible or true statements (premises) with a plausible statement (conclusion). In such inferences the connection between the premises and the conclusion cannot be reduced to the relationship between their logical structures, as is the case with deductive inferences. Plausible inferences take into consideration not only the logical structure of the premises and the conclusion but their plausibility values and semantic structure as well. They always rest on a *semantic relation*: for example, causality, analogy, similarity, sign, necessary or sufficient condition, part-whole relation, etc.

The first group of plausible inferences consists of cases in which there is a logical consequence relation between the premises and the conclusion, but at least one of the premises is only plausible and not true with certainty.⁹ In such cases, the conclusion is plausible on the basis of this inference as a source.¹⁰

In *the second group* of plausible inferences there is no logical consequence relation between the premises and the conclusion, and the premises are certainly true or at least plausible with respect to some set of reliable sources.¹¹ Such inferences are called enthymematic. In enthymematic inferences, the set of the premises has to be complemented by *latent background assumptions* (Rescher 1976: 60–63; Polya 1948: 223). These background assumptions have to be true with certainty, plausible, or at least not known to be implausible or false with certainty according to some source so that they make it possible to transform the inference to a plausible

⁹ More precisely, a logical consequence relation and some semantic relation hold between the premises and the conclusion, the premises constitute a consistent set of statements, and all premises have a positive plausibility value (that is, they are either plausible or true with certainty) on the basis of some set of sources S , while at least one of them is not true with certainty.

¹⁰ As for the connection between the plausibility value of the premises and conclusion, see Kertész and Rákosi (2012: Section 9.5.5).

¹¹ More precisely, the statements playing the role of the premises are consistent, they are plausible or true with certainty according to a set of sources, and a semantic relation can be reconstructed that connects them with the conclusion – but there is no logical consequence relation between them and the conclusion.

inference belonging to the first group. Of course, the conclusion is only plausible and not true with certainty.

Plausible inferences are *fallible*. At the outset, their conclusion is not true with certainty but only plausible to some extent; that is, the conclusion gets only partial support from the premises. Plausible inferences with latent background assumptions are especially liable to mislead because if one of the latent background assumptions is implausible or false, then the inference may be insufficient to establish the plausibility of the conclusion even when the premises are true or plausible. Moreover, taking into consideration a wider scope of sources, one may come into possession of information that makes the premises, the latent background assumptions or the conclusion implausible or false. Therefore, it is always the case that the conclusion is plausible only *relative to* the premises, the latent background assumptions and the sources supporting them. Accordingly, since the supposed rules, principles, constraints and the like that have been put forward during the history of generative linguistics have been obtained as conclusions of plausible inferences, and plausible inferences are fallible, the p-model claims that

(T)(c) The hypotheses of generative linguistics are fallible.

2.1.3. The p-context and its informational over- or underdetermination

The above characterization of plausible inferences suggests that the relation between the premises and the conclusion cannot be reduced to their formal properties. Beyond their logical structure, we have to take into consideration all pieces of information that may be relevant for judging the plausibility value of the premises and latent background assumptions. This motivates the introduction of the notion of *p-context*, which serves as the background against which plausible inferences can be put forward, used and evaluated. The p-context includes, first, a set of sources in terms of which the plausibility value of statements can be judged. For example, the linguistic theory may make use of the following sources in order to determine the plausibility of statements pertaining to the acceptability of sentences: native speakers' linguistic intuitions collected in an experiment, the linguist's own linguistic intuition, written or spoken corpora, well-designed experiments, online corpora, a particular tree-bank etc. Second, it covers a set of statements together with their plausibility values with respect to the sources in the p-context, and their logical and semantic structure. This means that the plausibility of each statement (datum, hypothesis, conjecture, prediction, etc.) has to be made explicit. Third, the p-context also involves the accepted methodological norms related to its components.

It may happen that in a p-context the sources yield too much information, in the sense that there is a statement which is made plausible by some source while its negation is made plausible by another. In such cases, the p-context is informationally *overdetermined* (Rescher 1976: 2; Rescher and Brandom 1980: 3-4) and the set of the plausible statements in the p-context is *p-inconsistent*. A typical case of overdetermination occurs when linguists reject a hypothesis on the basis of their linguistic intuition, while psycholinguistic experiments provide support for it – as discussed, for example, in Featherston (2007).

Nevertheless, the p-context may be informationally *underdetermined* as well (Rescher and Brandom 1980: 3-4). A typical case of the informational underdetermination of the p-context is its *p-incompleteness*, insofar as there are statements which are neither plausible (in the extreme case: true with certainty) nor implausible (in the extreme case: false with certainty) with respect to any source given. This is the case if we are not capable of finding a reliable source which could make it possible to assign a plausibility value to a statement or to its negation.

A p-context may be simultaneously informationally under- and overdetermined with respect to different statements. We call instances of p-inconsistency and p-incompleteness *p-problems*. If a p-context is characterised by over- and/or underdetermination in this sense, then

it is called *p-problematic*.

2.1.4. 'Data' and 'evidence' as plausible statements

The p-model suggests that data are not 'examples' such as *Wen_i meint Lydia, liebt Jakob t_i?* but that their structure consists of two components: a statement capturing an information content and a plausibility value (see also Rescher 1979: 69):

- (D) A datum is a plausible statement with a positive plausibility value originating from some direct source.

For example:

- (2) $0 < | \text{The sentence } \textit{Wen}_i \textit{ meint Lydia, liebt Jakob } t_i? \text{ is acceptable in German.} |_S < 1$ ¹²

Here *S* may be an experiment as a direct source. The first idea motivating the above definition is that the data sources used in linguistics are not completely reliable but have their own weaknesses and limitations.¹³ Nonetheless, statements which are of neutral plausibility or implausible according to some source in the p-context, do not qualify as data. The second idea behind (D) is that data are 'given' in a specific sense: their initial plausibility is determined not with the help of plausible inferences, but directly on the basis of the reliability of their direct source. Thus, they function as *starting points*: plausibility values may enter the argumentation process through them – and these plausibility values can be transferred to other hypotheses of the theory by plausible inferences. Since data are defined as statements possessing a positive plausibility value, and the plausibility value of statements depends on the p-context, data are p-context-dependent.¹⁴ Thus, our next thesis is:

- (T)(d) In generative linguistics, data are plausible statements with a positive plausibility value originating from some direct source.

The p-model defines three types of evidence in order to grasp the relationship between data and the hypotheses of the theory.

Weak evidence for a hypothesis *h* simply means that we can build plausible inference(s) making use of the given datum as a premise that make(s) *h* plausible (in the extreme case true with certainty). A datum can be weak evidence for a statement and its rival simultaneously, although the strength of the support that it provides them may differ. *Relative evidence* for a hypothesis *h* also requires that the datum provides stronger support to *h* than to its rivals. The third type is *strong evidence* which means that the datum makes only hypothesis *h* plausible and does not provide any support to its rivals.

The standard view of the philosophy of science treats evidence as a special subset of data that is assumed to be objective, is expected to justify hypotheses, is immediately given, and is held to be entirely reliable and primary to the theory. However, the concepts of weak, relative and strong evidence as we have just introduced them, differ from this view considerably. First, as opposed to the standard view of the philosophy of science, a datum is evidence not *per se*, but relative to a hypothesis. Accordingly, in the p-model evidence is p-context dependent and reliable only to a certain extent. Second, data which meet the criteria in the above three

¹² [whom_i thinks Lydia loves Jakob t_i], 'Who does Lydia think Jakob loves?'

¹³ This is the reason why in the first decade of our century a heated debate on the nature of linguistic data and evidence was initiated. See Kertész and Rákosi (2012) for the analysis of this discussion.

¹⁴ Accordingly, the p-model explicates the 'theory-ladenness' of data as 'p-context-dependence'.

definitions, do not, as a rule, perfectly support or refute the given hypothesis. The connection between the datum and the hypothesis is established by plausible inferences relying on plausible premises. Third, the function of evidence is not restricted by the p-model to the testing of hypotheses, but data and evidence play a role in every stage of the process of linguistic theorising.

This treatment of ‘evidence’ seems to reflect the way it has been used in generative linguistics. Although authors make ample use of the term ‘evidence’, virtually no hypothesis put forward within any version of generative linguistics could be supported with certainty by what a certain author called ‘evidence’. Since virtually all hypotheses in the past frameworks had to be given up, what has been called ‘evidence’ is substantially uncertain as well.

To sum up what has just been said, the last claim that explicates the property (P1) mentioned in the Introduction says:

(T)(e) In generative linguistics, evidence is uncertain and does not provide full support for the hypotheses of the theory.

2.2. On property (P2): The tolerance of inconsistency

From the late 1970s on, Chomsky regularly emphasised that his generative linguistics fits into what he calls the ‘Galilean style of science’. One component of the Galilean style of science is the ‘principle of epistemological tolerance’ (Botha 1983; Klausenburger 1983; Riemer 2009; Kertész 2012; Kertész and Rákosi 2013), which Chomsky characterizes as follows:

[a]pparent counterexamples and unexplained phenomena should be carefully noted, but it is often rational to put them aside pending further study when principles of a certain degree of explanatory power are at stake. How to make such judgements is not at all obvious: there are no clear criteria for doing so. [...] But this contingency of rational inquiry should be no more disturbing in the study of language than it is in the natural sciences. (Chomsky 1980: 2)

Applied to linguistic theories, this amounts to the claim that contradictions between the data and the hypotheses may be temporarily tolerated, in the hope that later, as inquiry progresses, more perfect versions of the theory will eliminate them. Thereby, the tolerance of the inconsistency serves the protection of the theory’s explanatory principles.

Of course, inconsistency tolerance is highly problematic, because it is at variance both with the criteria of rationality advocated by the standard view of the philosophy of science and the principle of non-contradiction of classical two-valued logic:

For it can easily be shown that if one were to accept contradictions, then one would have to give up any kind of scientific activity: it would mean *a complete breakdown of science*. This can be shown by proving that if two contradictory statements are admitted, any statement whatever must be admitted; for from a couple of contradictory statements any statement whatever can be validly inferred. (Popper 1962: 313; emphasis added)

Nevertheless, new developments in the philosophy of science and logic shed new light on the role which contradictions play in scientific theories. First, it has been argued that most scientific theories are inconsistent and that thereby the crucial question is why they are workable in spite

of their being inconsistent (see Meheus ed. 2002). Second, different kinds of paraconsistent logics have been developed which allow the simultaneous presence of contradicting statements but avoid logical chaos.

The logical consequence relation of classical two-valued logic is said to be *explosive*, which means that from a contradictory pair of premises any statement can be inferred. In contrast, a logical consequence relation is *paraconsistent* if and only if it is not explosive, and a logic is called paraconsistent if its logical consequence relation is not explosive. Accordingly, a paraconsistent logic allows for specific kinds of inconsistency without triggering logical chaos.¹⁵

Rescher and Brandom’s ‘logic of inconsistency’ (Rescher and Brandom 1980) is based on a Kripke-semantics, and they introduce, among other things, the operation of *superposition* on the set of possible worlds:

- (3) The *superposition* of the possible worlds w_1 and w_2 is a possible world w in which a statement p is true if and only if it is true either in w_1 or in w_2 .

Superposed worlds are *overdetermined* in the sense that in a superposed world w it can happen that both p and $\sim p$ are true (Rescher and Brandom 1980: 10).

‘ \cup ’ symbolises the operation of superposition. (3) says that p is true in $w_1 \cup w_2$ if and only if it is true *at least* in one of the component worlds w_1 and w_2 , respectively.

The semantic consequence relation in superposed worlds seems to differ radically from that of standard worlds because *a series of classical inference schemata are not valid*. Thus, principle (4) – which says that if the premises of a syntactically valid inference are true, then the conclusion must also be true – does not hold in superposed worlds:

- (4) If
 (a) $p_1, p_2, \dots, p_n \vdash q$ is a valid inference principle of classical logic, and
 (b) p_1 is true in w , p_2 is true in w , ..., p_n is true in w ,
 then
 (c) q is true in w .

As (4)(b) indicates, the premises are true *distributively*. According to (3), however, it is possible that p_1, p_2 etc. are true in different component worlds, without being true in the superposed world w as well. Nonetheless, a second interpretation of the requirement that “the premises have to be true” is also possible: in this interpretation, the premises must be true *collectively*, that is, within one component world. And this interpretation results in a principle that prevails in superposed worlds as well:

- (5) If
 (a) $p_1, p_2, \dots, p_n \vdash q$ is a valid inference principle of classical logic, and
 (b) $p_1 \& p_2 \& \dots \& p_n$ is true in w ,
 then
 (c) q is true in w .

From these considerations it is clear that the classical and paraconsistent treatment of inconsistency are different. In classical logic, there is no difference between (4) and (5), and any arbitrary statement can be inferred from a contradiction. In contrast, in paraconsistent logic, that is, in superposed worlds, (4)(b) and (5)(b) do not coincide and only (5) holds. Thus, we can distinguish between two kinds of inconsistency.

¹⁵ However, in order to avoid misunderstandings, it is important to distinguish paraconsistency from dialetheism. See on this, e.g. Priest et al.’s (2016) and Kertész and Rákosi’s (2013) concise overview.

We will speak of *weak* inconsistency if $w = w_1 \cup w_2$, and p is true in w and $\sim p$ is true in w . What does this mean? According to (3), if p is true in w , then p has to be true in one of the two possible worlds. Let us suppose that p is true in w_1 . Since in w_1 and w_2 the principles of standard logic prevail, $\sim p$ cannot be true in w_1 , too. However, $\sim p$ is true in w as well. From this it follows that $\sim p$ can be true only in the possible world w_2 , that is, the contradictory statements obtain in two distinct possible worlds. Therefore, logical chaos cannot emerge because the simultaneous use of p and $\sim p$ as the premises of inferences is, due to the failure of (4), forbidden; the two statements are *separated* into two different possible worlds. *Strong* inconsistency emerges if p & $\sim p$ is true in w , and, as (5) shows, p and $\sim p$ emerge within the same component world. Weak inconsistency can be evaluated as harmless, because it does not lead to the collapse of the system, whereas strong inconsistency is harmful.¹⁶

To sum up, the p-model captures the inconsistent nature of generative grammars in that it fits into current views in the philosophy of science which attempt to account for inconsistencies in scientific inquiry and also, in that it integrates paraconsistent logic. The above considerations boil down to the following claim:

- (T)(f) Generative linguistic theorizing makes use of paraconsistent tools, tolerating weak inconsistency but forbidding strong inconsistency.

2.3. On property (P3): The cyclic and prismatic nature of generative linguistic theorizing

In order to solve a p-problem (cf. Section 2.1.3), we have to re-evaluate the p-context by revising its elements. A *solution of a problem* is achieved if a p-context has been arrived at in which either (a) the statement responsible for the incompleteness of the previous p-context-version is unanimously supported or opposed by the sources, that is, it becomes either plausible or implausible on the basis of all sources, or (b) a paraconsistent treatment can be elaborated, that is, the statements generating p-inconsistency can be separated systematically and in a well-motivated way.

It is possible, however, that *a p-problem has several solutions*. This necessitates the introduction of the notion of the *resolution of a p-problem*. We resolve a p-problem if we find a solution of the given p-problem which is, when compared with other solutions, the best according to a particular set of accepted criteria and according to the information available. It may be the case, however, that in an informational state one can only show that for the time being there is no resolution achievable.

To achieve the solutions or the resolution of a given p-problem, a heuristic process is needed that we will call *plausible argumentation*. In simple terms, plausible argumentation consists of chains of plausible inferences and amounts to the gradual transformation of a p-problematic p-context into one which is no longer (or at least, less) p-problematic. This involves the successive *re-evaluation* of a p-problematic p-context by the elaboration of possible solutions to the problems it has raised, as well as the comparison of the alternative solutions. Its aim is to detect all available solutions and to decide which of them is to be accepted as the resolution of the given p-problem.

Accordingly, since, as a rule, the re-evaluation of a p-problematic p-context does result directly in an unproblematic one, but may raise new problems, the argumentation process requires the revision of previous decisions, the assessment of other alternatives, etc. Therefore, throughout the argumentation process one returns to the problems at issue again and again, and retrospectively re-evaluates the earlier decisions about the acceptance or rejection of statements, the reliability of the sources, the plausibility values of the statements, the workability of

¹⁶ See Kertész and Rákosi (2013) for examples in generative linguistics.

methodological norms, the conclusions previously reached by inferences etc. (cf. also Rescher 1976, 1987). This kind of retrospective re-evaluation is not linear, but *cyclic* and *prismatic*. The prismatic character means that the cycles continuously change the *perspective* from which the pieces of information constituting the p-context are evaluated (cf. Rescher 1987).

An *argumentation cycle* is a phase of the plausible argumentation process which develops a new solution to the p-problems included in the starting p-context and examines whether with this solution their resolution has been achieved. It may have *sub-cycles* which revise certain decisions made within the given argumentation cycle, and continue the argumentation process by coming back to an earlier stage of the argumentation cycle.

In sum:

(T)(g) Generative linguistic theorizing is of a cyclic and prismatic nature instead of being linear.

3. Case study

In order to explain the behaviour of modal verbs in Spanish and Italian, Zubizarreta (1982) raises the following hypothesis:

(6) Modal verbs behave in Spanish and Italian like main verbs (and unlike auxiliaries).

The starting p-context is p-incomplete because the plausibility/implausibility of (6) cannot be judged at the outset. She decides on the tenability of this hypothesis with the help of a 4-cycle process of plausible argumentation.

Argumentation cycle 1: First, she finds that (6) is supported by a series of syntactic tests:

- (7) *Null-complement anaphora:* In Spanish, VP complements of main verbs can be dropped in such a way that the complement can be reconstructed from the previous clause or the context, while with auxiliaries, this is not the case.¹⁷
- (8) *Placement of negation:* In Spanish, the negation is placed between main verbs and their verbal complements. Auxiliaries, however, are different: the negation cannot occur between the auxiliary and the verbal complement.
- (9) *Cliticization:* In Spanish, main verbs – in contrast to auxiliaries – allow clitics to be attached to their verbal complements.

(7)-(9) work as parts of indirect sources (that is, chains of plausible inferences) with the help of which the initial plausibility value of (6) can be determined. The first plausible inference, based on (7), is (10):

- (10) $0 < \text{ |If in Spanish, VP complements of modals can be dropped in such a way that the complement can be reconstructed from the previous clause or the context, then the sentences } \textit{Juan podría/debería visitar a María y Pedro también podría/debería} \text{ are grammatically correct.} |_Z < 1^{18}$
 - $0 < \text{ |The sentences } \textit{Juan podría/debería visitar a María y Pedro también podría/debería} \text{ are grammatically correct.} |_Z < 1$
-

¹⁷ For the concept of ‘null-complement anaphor’ see, for example, Huang (2000: 5).

¹⁸ [John could/should visit to Mary and Peter also could/should [...]]
‘John could/should visit Mary and Peter could/should also do so.’

- 0 < |In Spanish, VP complements of modals can be dropped in such a way that the complement can be reconstructed from the previous clause or the context. |(10) < 1

Apparently, there is no logical consequence relation between the premises and the conclusion. This inference is enthymematic but capable of making its conclusion plausible because it belongs to the second group of plausible inferences we have introduced in Section 2.1. The plausibility value of the first premise of (10) originates from Zubizarreta's metalinguistic intuition as a direct source. It contains the result of linguistic analyses, because it presupposes that the two sentences mentioned in the consequent have the syntactic structure described in the antecedent. The second premise is a grammaticality judgement based on Zubizarreta's linguistic intuition as a native speaker. This means that both premises are plausible statements since their sources are not completely reliable.¹⁹ Thus, they capture that (6) has been successfully tested on two pieces of linguistic data. Further, the premises can be completed by latent background assumptions such as the statement that all other sentences with a similar syntactic structure are also grammatical in Spanish etc. These background assumptions are plausible (as soon as they have been checked) or they are of neutral plausibility (if they have not been checked yet). Since all premises and latent background assumptions possess a plausibility value, the conclusion of (10) can be deemed plausible as well, on the basis of this inference as an indirect source.

The next member of this chain of inferences, (11), belongs to the first group of plausible inferences, because it is deductively valid and its premises are plausible statements:

- (11) 0 < |If in Spanish, VP complements of auxiliaries can be dropped in such a way that the complement can be reconstructed from the previous clause or the context, then the sentence *Juan ha visitado a María y Pedro también ha* is grammatically correct. |_z < 1²⁰
- 0 < |The sentence *Juan ha visitado a María y Pedro también ha* is grammatically not correct. |_z < 1
-
- 0 < |In Spanish, VP complements of auxiliaries cannot be dropped in such a way that the complement can be reconstructed from the previous clause or the context. |(11) < 1

Making use of the conclusions of (10) and (11), Zubizarreta draws the following plausible inference:

- (12) 0 < |In Spanish, VP complements of modals can be dropped in such a way that the complement can be reconstructed from the previous clause or the context. |(10) < 1
- 0 < |In Spanish, VP complements of auxiliaries cannot be dropped in such a way that the complement can be reconstructed from the previous clause or the context. |(11) < 1
- [0 < |In Spanish, VP complements of main verbs can be dropped in such a way that the complement can be reconstructed from the previous clause or the context. |_z < 1] (= (7))
-
- 0 < |Modals behave in Spanish like main verbs (and not as auxiliaries). |(12) < 1 (= (6))

The conclusion of (12) contains a generalisation because it declares a high degree of analogy based on one common feature. Accordingly, (12) is an indirect source making (6) plausible, or, to formulate the result of our reconstruction differently, the datum 'The sentences *Juan*

¹⁹ Cf., for example, Schütze (1996) on the unreliability of grammaticality judgements and our earlier remarks on the current discussion of linguistic data and evidence.

²⁰ [John has visited to Mary and Peter also has [...]]
'John has visited Mary and Peter has also done so.'

podría/debería visitar a María y Pedro también podría/debería are grammatically correct’ provides strong evidence for (6).

The second test made use of by Zubizarreta pertains to the place of negation, see (8). The related chain of inferences can be reconstructed as follows:

- (13) $0 < |$ If in Spanish, the negation is placed between modals and their verbal complements, then the sentences *Pedro podría/debería **no** contestar la carta* are grammatically correct. $|_Z < 1^{21}$
 $0 < |$ The sentences *Pedro podría/debería **no** contestar la carta* are grammatically correct. $|_Z < 1$

 $0 < |$ In Spanish, the negation is placed between modals and their verbal complements. $|_{(13)} < 1$
- (14) $0 < |$ If in Spanish, the negation is placed between auxiliaries and their verbal complements, then the sentence *Pedro ha **no** contestado la carta* is grammatically correct. $|_Z < 1^{22}$
 $0 < |$ The sentence *Pedro ha **no** contestado la carta* is grammatically not correct. $|_Z < 1$

 $0 < |$ In Spanish, the negation cannot be placed between auxiliaries and their verbal complements. $|_{(14)} < 1$

It is easy to see that (13) and (14) have the same structure as (10) and (11), respectively. From the conclusions of (13) and (14), Zubizarreta obtains (15), which is a counterpart of (12):

- (15) $[0 < |$ In Spanish, the negation is placed between main verbs and their verbal complements. $|_Z < 1]$
 $0 < |$ In Spanish, the negation is placed between modals and their verbal complements. $|_{(13)} < 1$
 $0 < |$ In Spanish, the negation cannot be placed between auxiliaries and their verbal complements. $|_{(14)} < 1$

 $0 < |$ Modals behave in Spanish like main verbs (and not as auxiliaries). $|_{(15)} < 1 (= (6))$

Since the inference (15) makes (6) plausible as an indirect source, the plausibility of this hypothesis increases.

The third test, appertaining to the cliticization in Spanish, was based on (9). The chain of inferences related to (9) is similar to (10)-(12) and (13)-(15), and makes use of the following data:

- (16) $0 < |$ The sentences *Pedro puede/debe contestarla* are grammatically correct. $|_Z < 1^{23}$
(17) $0 < |$ The sentence *Pedro ha contestadola* is grammatically not correct. $|_Z < 1^{24}$

When we add these data and indirect sources (plausible inferences) to the p-context, the plausibility of (6) further increases. This value becomes even higher after extending the p-context

²¹ [Peter could/should not answer the letter]
‘Peter could/should not answer the letter.’

²² [Peter has not answered the letter]
‘Peter has not answered the letter.’

²³ [Peter can/must answer-acc. cl.]
‘Peter can/must answer it.’

²⁴ [Peter has answered-acc. cl.]
‘Peter has answered it.’

with (18), because there is a strong analogy between the two hypotheses:

(18) $0 < \text{|From several points of view, modals behave in Italian like main verbs.}|_{\text{Rizzi (1978)}} < 1$

If one made a decision on the basis of this state of the p-context, one should evidently give up $\sim(6)$ and keep (6) as the solution of the starting p-problem. There are, however, further data that are relevant to this problem. Therefore, no decision can be made at this point, but a new argumentation cycle has to be started which will yield a new solution to the starting p-problem.

Argumentation cycle 2: There are also tests that lead to a result inconsistent with (6). The first of these is (19):

(19) *Cliticization:* In Spanish and Italian, auxiliaries allow clitics to be attached to them. Main verbs, in contrast, do not allow it.

In relation to (19), we obtain the following series of plausible inferences:

(20) $0 < \text{|If in Spanish and Italian, modals allow clitics to be attached to them, then the sentences } Pedro \textit{ le pudo/debió hablar personalmente} \text{ and } Gianni \textit{ gli ha dovuto/potuto parlare personalmente} \text{ are grammatically correct.}|_Z < 1^{25}$
 $0 < \text{|The sentences } Pedro \textit{ le pudo/debió hablar personalmente} \text{ and } Gianni \textit{ gli ha dovuto/potuto parlare personalmente} \text{ are grammatically correct.}|_Z < 1$

 $0 < \text{|In Spanish and Italian, modals allow clitics to be attached to them.}|_{(20)} < 1$

(21) $0 < \text{|If in Spanish and Italian, main verbs allow clitics to be attached to them, then the sentences } Pedro \textit{ le prometió hablar personalmente} \text{ and } Gianni \textit{ gli ha promesso di parlare personalmente} \text{ are grammatically correct.}|_Z < 1^{26}$
 $0 < \text{|The sentences } Pedro \textit{ le prometió hablar personalmente} \text{ and } Gianni \textit{ gli ha promesso di parlare personalmente} \text{ are grammatically not correct.}|_Z < 1$

 $0 < \text{|In Spanish and Italian, main verbs do not allow clitics to be attached to them.}|_{(21)} < 1$

(22) makes use of the comparison and the contrast between the conclusions of the previous two inferences:

(22) $0 < \text{|In Spanish and Italian, modals allow clitics to be attached to them.}|_{(20)} < 1$
 $0 < \text{|In Spanish and Italian, main verbs do not allow clitics to be attached to them.}|_{(21)} < 1$
 $0 < \text{|If in Spanish and Italian, modals allow clitics to be attached to them, while main verbs do not, then modals behave in Spanish like non-main verbs.}|_Z < 1$

 $0 < \text{|Modals behave in Spanish like non-main verbs.}|_{(22)} < 1 (= \sim(6))$

The last test Zubizarreta refers to, can be formulated as follows:

(23) *Impersonal passive:* Auxiliaries, in contrast to main verbs, allow impersonal *se*-passive in Spanish and impersonal *si*-passive in Italian.

²⁵ [Peter dat. cl. could/had to speak personally]
 ‘Peter could/had to speak to him/her personally.’

²⁶ [Peter dat. cl. promised to speak personally]
 ‘Peter promised to speak to him/her personally.’

Plausible inferences related to (23) increase the plausibility value of $\sim(6)$, since they result in the same final conclusion. They have the same structure as (20)-(22), and rely on the following data:

- (24) $0 < |$ The sentences *Estos libros se podrían/deberían comprar ya* and *Questi libri si potrebbero/dovrebbero comprare già* are grammatically correct. $|_Z < 1^{27}$
- (25) $0 < |$ The sentences *Estos libros se prometieron comprar* and *Questi libri si promisero di comprare* are grammatically not correct. $|_Z < 1^{28}$

The upshot of this argumentation cycle is that these two chains of inferences are indirect sources that make the hypothesis (6) implausible.

Obviously, the simultaneous presence of (6) and its negation make the p-context *p-inconsistent*. This p-inconsistency relies on the background assumption that modals do not constitute a third, autonomous category of verbs but behave either like main verbs or as auxiliaries, and on two analogies: Spanish and Italian modals behave like main verbs from certain points of view, and, at the same time, they are similar to auxiliaries in some other respects.

Argumentation cycle 3: As we have seen, both members of this p-inconsistency are supported by pieces of evidence with a similar origin and structure. Therefore, the strategy of treating (6) and its negation as rival alternatives and trying to make a decision between them does not seem to be viable. Thus, while the outcome of the tests points toward the stance that neither member of this inconsistency can be given up, it is also clear that the unrestricted simultaneous maintenance of (6) and its negation would lead to logical chaos. Zubizarreta (1982: 138), however, realises that (6) and its negation can be maintained simultaneously in such a way that they become separated from each other. The first step in this direction is a thorough description of the circumstances in which the non-main verb behaviour of modals appears:

- (26) When modals behave in Spanish like non-main verbs in connection with cliticization and impersonal passive, or in connection with Auxiliary Change in Italian, then they also behave as non-main verbs with respect to the following phenomena: Cleft-formation, Right-node raising, Heavy-NP shift, *Wh*-movement, null-complement anaphora and placement of negation. Otherwise, they behave as main verbs.

(26) is made plausible by two plausible inferences as indirect sources:

- (27) $0 < |$ If (26), then a modal behaves in respect to null-complement anaphors as a non-main verb when a clitic is attached to it. $|_Z = 1$
- $0 < |$ If a modal behaves in respect to null-complement anaphora as a non-main verb when a clitic is attached to it, then the sentences *Juan podría/debería visitar a María y Pedro también la podría/debería* are grammatically not correct. $|_Z < 1^{29}$
- $0 < |$ The sentences *Juan podría/debería visitar a María y Pedro también la podría/debería* are grammatically not correct. $|_Z < 1$
-
- $0 < |(26)|_{(27)} < 1$

²⁷ [These books refl. cl. could/should buy by-now]
‘These books could/should have been bought by now.’

²⁸ [These books refl. cl. promised buy]
‘These books were promised to be bought.’

²⁹ [John could/should visit to Mary and Peter also acc. cl. could/should]
‘John could/should visit Mary and Peter could/should also do so.’

- (28) $0 < | \text{If (26), then negation cannot be placed between the modal and the verb when a clitic is attached to the former.} |_Z = 1$
 $0 < | \text{If negation cannot be placed between the modal and the verb when a clitic is attached to the former, then the sentences } \textit{Juan la podría/debería no contestar} \text{ are grammatically not correct.} |_Z < 1^{30}$
 $0 < | \text{The sentences } \textit{Juan la podría/debería no contestar} \text{ are grammatically not correct.} |_Z < 1$

 $0 < |(26)|_{(28)} < 1$

(27) and (28) belong to the first group of plausible inferences, that is, they are enthymematic. Therefore, they have to be completed by latent background assumptions, whose elaboration, however, we omit for the sake of transparency of the structure of these inferences. These background assumptions refer to further successful tests of the predictions obtained from (26).

As a second step, Zubizarreta (1982: 139) investigates Strozer's (1976) solution of the p-inconsistency between (6) and its negation:

- (29) Modals in Spanish and Italian are main verbs and also auxiliaries under the circumstances described in (26).

Hypothesis (29) is a paraconsistent solution. It keeps both members of the conflict, but it does not lead to logical chaos, because with the help of (26), it clearly separates the fields of application of the two conflicting statements.

Nonetheless, Zubizarreta (1982: 139–140) comes to the conclusion that this hypothesis is not acceptable, either, because it generates further p-inconsistencies. Namely, it is in conflict with several hypotheses of generative grammar with a high plausibility value. For example:

- (30) $0 < | \text{If the sentences } \textit{Pedro la debería poder visitar} \text{ and } \textit{Pedro la querría poder comenzar a escribir} \text{ are grammatically correct, and modals in Spanish are main verbs and also auxiliaries under the circumstances described in (26) (= (29)), then modals in Spanish can co-occur if they function as auxiliaries.} |_Z < 1^{31}$
 $0 < | \text{If modals can co-occur if they function as auxiliaries, then Aux is a recursive node.} |_Z < 1$
 $0 < | \text{The sentences } \textit{Pedro la debería poder visitar} \text{ and } \textit{Pedro la querría poder comenzar a escribir} \text{ are grammatically correct.} |_Z < 1$
 $0 < | \text{Aux is not a recursive node.} |_Z < 1$

 $0 < | \text{It is not the case that modals in Spanish are main verbs and auxiliaries as well under the circumstances described in (26) (= } \sim(29)\text{).} |_{(30)} < 1$

It is easy to identify the problematic point: while (29) seems to be on the right track in relation to the double-facedness of Spanish and Italian modals and stipulating the circumstances when they behave as main verbs and non-main verbs, it categorizes the non-main verb behaviour incorrectly.

Argumentation cycle 4: Zubizarreta re-evaluates this part of (29), and raises a modified version of it:

³⁰ [John acc. cl. could/should not answer]
 'John could/should not answer it.'

³¹ [Peter acc. cl. should can visit]; [Peter acc. cl. would-like-to can start to write]
 'Peter should be able to visit her'; 'Peter would like to be able to start writing it'.

- (31) Modals in Spanish and Italian have two parallel syntactic structures. They are main verbs (argument-taking predicates) as well as non-main verbs (that is, verbal affixes), but under different conditions.

That is, she represents Spanish and Italian sentences containing a modal verb with the help of the following double tree structure (cf. Zubizarreta 1982: 161):

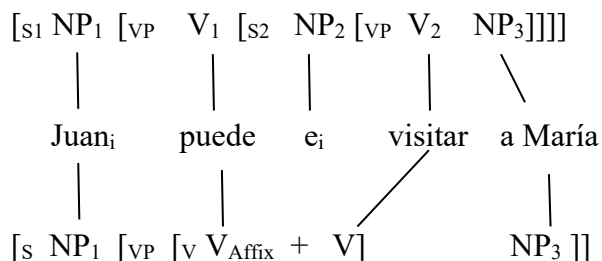


Figure 6

Argumentation cycle 4 results in a *modified* p-context version. This p-context version contains both members of the p-inconsistency but in such a way that with the help of (26), they are *systematically separated* from each other into two p-context versions. That is, if a clitic is attached to the modal, or if the modal is in *se*-passive, then the modal does not behave like a main verb but as a verbal affix; in contrast, in other cases it behaves like a main verb.

In this way, Zubizarreta considers (31) the best available solution, because on the basis of the pieces of information at her disposal, there is no counter-evidence against it. Accordingly, (31) is the *resolution* of the p-problem pertaining to (6) in the sense of the p-model (see Section 2.3).

That (31) does not result in logical chaos boils down to the claim that Zubizarreta's theory is *paraconsistent*:

- (32) (a) Both (6) and its negation can be assigned a similarly high plausibility value on the basis of a series of indirect sources.
 (b) Therefore, the p-context containing (6) and its negation are p-inconsistent.
 (c) Let w_1 be the set of sentences in which cliticization, impersonal passive, or Auxiliary Change occur in connection with modals and w_2 sentences in which these structures do not occur in connection with modals.
 (d) Let $w = w_1 \cup w_2$. Since w_1 and w_2 are complementary, w is the whole of Zubizarreta's theory.
 (e) (6) will be true in w_1 and false in w_2 , while its negation will be true in w_2 and false in w_1 .
 (f) Both (6) and $\sim(6)$ are true in w , because each of them is true in one of the component worlds of w . However, the statement (6) & $\sim(6)$ is false in w_1 , in w_2 , and, therefore, in w too, because neither w_1 nor w_2 includes both of them.

4. Conclusions

The p-model has yielded the hypotheses (T)(a)-(T)(g) on the nature of generative linguistic theorizing (see also Kertész 2017). By arguing for these tenets, we have shown, first, that the way in which generative linguistics proceeded in the past decades and is functioning today differs significantly from what either of the extreme positions mentioned in (i) and (ii) in

Section 1 assumes. Proposals which in the generative linguistics literature have been put forward to fulfil the requirement of turning linguistics into a mature empirical theory are not based on workable and generally applied norms of natural sciences but rather, on outmoded and untenable tenets of the standard view of the analytical philosophy of science.

The p-model of plausible argumentation rejects – in harmony with current trends in the philosophy of science – a series of methodological prejudices which mainstream linguistics takes implicitly or explicitly for granted, but which are at variance with the research practice. Therefore, the p-model's foci are up-to-date from a more general point of view, too. The p-model's originality is due to the way it tries to integrate these themes to a comprehensive and full-fledged model of linguistic theorizing.

Finally, in the course of linguistic inquiry three closely interacting activities are needed: of course, *object-scientific* research in the sense that the linguist applies the framework chosen to the selected data in order to solve the problems raised; careful metatheoretical *self-reflection* on her own activity that may also include considering foundational questions of the field only indirectly related to her everyday problem solving activity; and *metatheoretical* insights gained by professional philosophers of science which may be used to furthering the *object-scientific* research methods of linguistics. Only if all three processes are simultaneously present, carefully comprehended and adjusted can the linguist hope to contribute to the effectiveness, fruitfulness and reliability of linguistic theorizing.

5. References

- Andor, József. 2004. The master and his performance: An interview with Noam Chomsky. *Intercultural Pragmatics* 1, 93–111.
- Behme, Christina. 2014. A 'Galilean' science of language. *Journal of Linguistics* 50, 671–704.
- Botha, Rudolf P. 1983. On the 'Galilean style' of linguistic inquiry. *Lingua* 58, 1–50.
- Chomsky, Noam. 1957. *Syntactic structures*. The Hague & Paris: Mouton.
- Chomsky, Noam. 1980. On binding. *Linguistic Inquiry* 11, 1–46.
- Featherston, Sam. 2007. Data in generative grammar: The stick and the carrot. In Wolfgang Sternefeld (ed.), *Data in generative grammar* (= *Theoretical Linguistics* 33(3)), 269–318.
- Huang, Yan. 2000. *Anaphora. A cross-linguistic study*. Oxford: Oxford University Press.
- Hung, Edwin. 2014. *Philosophy of science complete. A text on traditional problems and schools of thought*. Wadsworth: Cengage Learning.
- Jackendoff, Ray. 1994. *Patterns in the mind: Language and human nature*. New York, NY: BasicBooks.
- Kertész, András. 2012. The 'Galilean style in science' and the inconsistency of linguistic theorising. *Foundations of Science* 17, 91–108.
- Kertész, András. 2017. *The historiography of generative linguistics*. Tübingen: Narr Francke Attempto.
- Kertész, András & Csilla Rákosi. 2012. *Data and evidence in linguistics: A plausible argumentation model*. Cambridge: Cambridge University Press.
- Kertész, András & Csilla Rákosi. 2013. Paraconsistency and plausible argumentation in Generative Grammar: A case study. *Journal of Language, Logic and Information* 22, 195–230.
- Kertész, András & Csilla Rákosi. 2014. The p-model of data and evidence in linguistics. In András Kertész & Csilla Rákosi (eds.), *The evidential basis of linguistic argumentation*, 15–48. Amsterdam & Philadelphia: Benjamins.
- Klausenburger, Jurgen. 1983. Review of Botha, R., 'On the 'Galilean Style' of Linguistic Inquiry'. *Language* 59, 434.
- Meheus, Joke (ed.). 2002. *Inconsistency in science*. Dordrecht: Kluwer.

- Piattelli-Palmarini, Massimo. 1998. Foreword. In Juan Uriagereka (ed.), *Rhyme and reason: An introduction to minimalist syntax*, xxi–xxxvi. Cambridge, MA: The MIT Press.
- Polya, George. 1948. *How to solve it*. Princeton: Princeton UP.
- Popper, Karl. 1962. *Conjectures and refutations*. London.
- Priest, Graham, Tanaka, Koji & Zach Weber. 2016. Paraconsistent Logic. In: Edward N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy*.
<<https://plato.stanford.edu/archives/win2016/entries/logic-paraconsistent/>>.
- Pullum, Geoffrey K. 2017. Theory, data, and the epistemology of syntax. In Konopka, Marek & Angelika Wöllstein (eds.), *Grammatische Variation. Empirische Zugänge und theoretische Modellierung*, 283–298. Berlin: De Gruyter.
- Rescher, Nicholas. 1976. *Plausible reasoning*. Assen & Amsterdam: Van Gorcum.
- Rescher, Nicholas. 1979. *Cognitive systematisation*. Oxford: Blackwell.
- Rescher, Nicholas. 1987. How serious a fallacy is inconsistency? *Argumentation* 1, 303–316.
- Rescher, Nicholas & Robert Brandom. 1980. *The logic of inconsistency*. Oxford: Blackwell.
- Riemer, Nick. 2009. Grammaticality as evidence and as prediction in a Galilean linguistics. *Language Sciences* 31, 612–633.
- Rizzi, Luigi. 1978. A restructuring rule in Italian syntax. In Samuel Jay Keyser (ed.), *Recent transformational studies in European languages*. Linguistics Inquiry Monograph Three, 113–158. Cambridge: MIT Press.
- Sampson, Geoffrey. 1975. *The form of language*. London: Weidenfeld & Nicholson.
- Sampson, Geoffrey. 2007. Reply. *Corpus Linguistics and Linguistic Theory* 3, 111–129
- Sampson, Geoffrey & Eszter Babarczy. 2013. *Grammar without grammaticality: Growth and limits of grammatical precision*. De Gruyter.
- Schütze, Carson T. 1996. *The empirical base of linguistics. Grammaticality judgments and linguistic methodology*. Chicago & London: The University of Chicago Press.
- Strozer, Judith Reina. 1976. *Clitics in Spanish*. Doctoral Dissertation, UCLA
- Zubizarreta, Maria Luisa. 1982. *On the Relationship of the Lexicon to Syntax*. Ph.D. Diss., Cambridge, Mass: MIT.