

TWO NOTIONS OF UNIVERSAL GRAMMAR

Esa Itkonen

University of Turku

1. SOME HISTORICAL BACKGROUND

The history of Western linguistics is to a large extent a history of *universal grammar*; this is one of the basic tenets of Itkonen (1991). This notion, implicit in Aristotle's thinking, becomes fully explicit in the doctrine of the medieval grammarians, the so-called Modistae. It was their stated goal to *explain* the language universals (= *modi significandi*) by showing how they have been jointly *caused* by the extralinguistic reality (= *modi essendi*) and the human cognition (= *modi intelligendi*). From the explainability of universal grammar they correctly inferred that it cannot be innate: "Notitia modorum significandi intellectui non est innata" (Pseudo-Albertus Magnus 1977:38).

The tradition of universal grammar continued uninterrupted until the end of the 19th century (for details, see Itkonen 1991:5.4–5). There we meet Georg von der Gabelentz, who emphatically repeats the Modistic view that, rather than being declared innate, language universals ought to be explained: "Mit der Frage nach den angeborenen Ideen brauchen wir uns hier nicht zu beschäftigen. Eine Idee für angeboren erklären, heisst erklären, dass sie unerklärbar sei" (1891:365).

Contrary to some current misrepresentations of history, the idea of universal grammar was alive also in the first half of the 20th century, for instance in the work of Otto Jespersen and, somewhat less explicitly, of Edward Sapir. And even Leonard Bloomfield did not deny outright the possibility of universal grammar.

In the sixties there were two competing approaches to language universals: Greenberg noted generally (rather than universally) valid correlations between various linguistic phenomena, without any systematic attempt at explaining them, whereas Chomsky practised some sort of 'universal grammar of English', taking the syntax of his native language to be an innate component of the human mind.

Since the late sixties and early seventies, there was growing discontent with Chomsky's innatism (or nativism). The following excerpts sum up one particular way in which this feeling was justified at the time:

"It is an objectively given fact that language embodies or reflects a certain kind of ontology or world-conception... In the primary cases at least, language reproduces the ontology of human cognition without adding anything to it. Consequently, in these cases at least, the ontology of language may be identified with the ontology elicited by the empirical study of cognition" (Itkonen 1972:6). "Philosophical semantics has practically nothing to say about the empirically analyzable relation between natural languages and the actual world" (p. 10). "It can be predicted that what is significant within cognition will have its counterpart within language and, moreover, that there will exist some kind of very general formal similarity between the two" (p. 14). "It is rather unilluminating to postulate that the formal characteristics recurring in particular natural languages are innate, universal properties, because these characteristics may to a certain extent at least be explained, or derived, by bringing them into relation with human cognitive capacities and the functions which the natural language has to perform in the framework of these capacities" (p. 15). "Because of its explanatory role the functional aspect of language, which is neglected in all current versions of universal linguistic theory, is even more important than the formal aspect, to which practically all attention is being paid" (p. 16). "The structural similarity between utterances and facts shows that the idea of an isomorphism can also be maintained within natural languages and not only within artificial languages" (p. 118).¹

Since the beginning of the eighties, explicit and informative explanations of language universals have been offered in growing numbers. At least the following works deserve to be mentioned: Comrie (1981), Givón (1984), Haiman (1985), Haiman (ed., 1985), Hawkins (ed., 1988).

2. THREE DIFFERENT BASES FOR EXPLAINING LANGUAGE UNIVERSALS: ONTOLOGICAL, COGNITIVE, AND SOCIAL

Linguistic structure is a result of 'multiple causation'; and it is the linguist's task afterwards to disentangle the contributions made by different causally effective factors. These may be chosen and classified in various ways. For my part, I find it illuminating to divide them in three principal groups.

Ontological explanations refer to the way in which the structure of extralinguistic reality is reflected in linguistic structure, producing a relation of *isomorphism* between the two.² It goes without saying that there can be no 'pure' ontology; rather, each ontology is already a result of conceptualization.

Cognitive explanations refer to the way in which a human being *relates himself* to what is ontologically definable. Precisely because there is no pure ontology, the difference between ontology and cognition, though real, can only be an approximative one. In a situation like this, it is important first of all to establish the *clear cases*: That one event temporally precedes another, is an *ontological* fact, although both 'event' and 'temporal precedence' are certainly results of human concept-formation. By contrast, either denying or inferring the occurrence of an event is a *cognitive* fact (more precisely, a cognitive operation), because, instead of being part of the extramental reality, it is directed toward this reality (more precisely, applies to mental representations of this reality).

Finally, *social* explanations refer to the *interaction* between human beings relating themselves to what is ontologically definable. It should be noted that the logical order in which the subject matter is presented here is the reverse of the temporal order in which one gets to know it. What is immediately given, is the general social fact of people interacting with one another, and it is only little by little that one realizes that it may be useful to see this fact as 'containing' the ontological and cognitive facts.

In what follows, I shall characterize very briefly these three types of explanation. They deserve of course a much fuller treatment, but this is not the place for it.

Isomorphism between states of affairs and sentences is instantiated by their respective constituents on the following dimensions: a) number, b) qualitative properties, c) quantitative properties, d) order, e) cohesion.

These five dimensions will now be illustrated. (More detailed evidence is to be found e.g. in Haiman [ed., 1985].) *Ad a)*: What is known about the cognition of preverbal children and of the deaf, indicates that they perceive the reality in the same way as those equipped with an oral language do. This fact *explains* why a sentence referring to an 'agent-action-patient' state of affairs generally contains three words. *Ad b)*: The ontological difference between thing and action produces the morphological difference between noun and verb, and as the former difference diminishes, the latter diminishes as well.³ There is a similar, even if somewhat less clear-cut correspondence between agent and subject, and between patient and object. *Ad c)*: In the linguistic 'singular-plural' distinction the latter term is more complex, corresponding to greater ontological complexity. Also the 'concrete-abstract' distinction, reflected as that between lexical (= 'more') and grammatical (= 'less') belongs here. *Ad d)*: Temporal and causal order is reflected as linguistic order: in many languages sentences referring to what precedes must precede sentences referring to what follows; in no language is the inverse order obligatory. The preferred SO word order reflects the action 'passing over' from the agent to the patient. *Ad e)*: A person may have several types of relation to states of affairs, and as his causal power increases, the sentence referring to the state of affairs tends to be absorbed into the sentence expressing the relation. Because noun phrases and sentences refer to discrete extralinguistic entities, i.e. things and states of affairs, it is not permissible to move any constituents out of them, at least not far enough for the connection to become opaque. (This is the explanation of 'subjacency'.) For the same reason, when something is moved, it is moved as a whole. (This is the explanation of 'structure-dependency'.)

Cognitive explanations constitute a more heterogeneous group. As noted before, the underlying idea here is the person *adding*, or contributing, something to what is ontologically given, or ontologically definable. Accordingly, this is the place for the traditional *deicticity*, as expressed by grammatical persons, demonstratives, (in)definiteness, and spatial terminology. (Many examples are provided e.g. by Rudzka-Ostyn [ed., 1988].) That is to say, deictic elements are seen here as explained by the 'positions' that the speaker and the hearer occupy vis-à-vis the ontological 'core' of the speech situation. Notice that deicticity is not reflected structurally in language: it is not the case that the sentence would somehow reproduce, picture-like, the relation of the speaker to what he is going to

speak about. Rather, it is just a matter of this (deictic) relation finding, or producing, *some* linguistic expression.

Cognitive explanations range over a wide area of application. They start with general facts of human cognition, as contrasted with animal cognition (for instance, the *lack* of specific vocabulary concerned with smell). Moreover, the constitution of the human body conditions to a large extent which types of experience are deemed important, as shown by the copiousness vs. scarceness of corresponding lexical items (cf. Lee 1988). A particularly important phenomenon is the 'figure-ground' distinction, which is based on the fact that what is small is, for obvious reasons, manipulated with respect to what is big, rather than vice versa, a fact reflected, among other things, in the use of case endings and prepositions (cf. Talmy 1983). Metaphor is explained by showing that apparently non-personal and disembodied abstractions have their origin in the egocentric experience of the 'body-in-space' (cf. Johnson 1987).

Here we have to face the difficulties involved in making the distinction between ontological and cognitive. Speech acts like questions and commands clearly express attitudes which 'flow from' the speaker. Once this is admitted, it becomes impossible to treat statements any differently. Thus, it turns out that ontological isomorphism is always embedded in a wider cognitive (i.e. deictic/attitudinal/actionist) context. We also realize that among the non-linguistic qualitative properties reflected in language (= point *b* above) there are those which, unlike the basic 'thing vs. action' distinction, are quite obviously motivated by practical considerations, as shown by studies on noun classification/categorization (cf. Craig [ed., 1986]). Also some quantitative properties (= point *c*) are clearly such as to result from mental operations; just consider the act of comparison vs. the lack of it involved in comparative/superlative (= 'morphologically more') vs. positive (= 'morphologically less'). Such operations as identifications, quantifications, negations, and inferences obviously have no ontological correlates; it also seems clear that they exist on a non-linguistic level, before being linguistically expressed.

Social or interactionist explanations concern phenomena which are broadly characterized as 'discourse-pragmatic'. I think it is fair to say that at present this type of explanation produces less reliable results than the other two, mainly because it often violates the principle 'same cause-same effect'.

3. EXPLANATION-BY-ISOMORPHISM: A CLOSER LOOK

Using isomorphism as an explanatory principle becomes more plausible when it is seen that such explanations are employed also outside the customary language-universals research. But first it is advisable to ask what, precisely, is being explained here.

Ever since the Modistae, explanations-by-isomorphism have been formulated so as to suggest that, having grasped or conceptualized the extramental reality in a certain way, somebody goes on to verbalize it in a structurally similar way. Taken literally, however, such an account could only apply to the mythical 'creator of language', or *nomothetes*, as Plato calls him (see Itkonen 1991:5.1.1). To be acceptable, therefore, modern explanations-by-isomorphism must admit of some more realistic interpretation.

The explanandum here is linguistic structure, but this is just a shorthand expression for the fact that a child learns a language structured in such and such a way, and later, as an adult, maintains it more or less in the same form. The latter point is crucial. If the language were not felt to be adequate to its purpose (here: to what it refers to), it would change in a random fashion. That it does not, i.e. that it changes only in ways which do not destroy the isomorphic relation to the extralinguistic reality, reveals, precisely, the explanatory role of isomorphism. This is the modern interpretation of the Modistic view that *modi significandi a modis essendi causantur*. (Analogous remarks apply to the other two types of explanations as well.) Notice, however, that the idea of 'isomorphism-as-creation' is not as spurious as one might think at first. Cases which come closest to genuine 'linguistic creation', namely home-sign systems and creoles, invariably exhibit strong degrees of isomorphism (cf. below).

The view that I am setting forth here presupposes that the child possesses a non-linguistic ontology with such notions as 'thing', 'action', 'causation', and the like, and that, while learning his first language, he is able to monitor the relation of linguistic categories to ontological categories. Current research seems indeed to bear out these assumptions.

Let us consider the cognition of preverbal children. Until recently, research in this area was hampered by the fact that the sensori-motor abilities of 4–6-month-old infants are quite undeveloped. (Animal tests, for instance, are based on behavioral reactions, but a 4-month-old child cannot be tested in the same way, because he exhibits no comparable

behavior.) Piaget committed the mistake of defining the cognitive development in terms of the sensori-motor development. Instead of asking whether cognitive differences are caused exclusively by differences in sensori-motor abilities, he assumed this to be the case. (Whorf committed an analogous mistake: instead of asking whether differences between English and Hopi produce comparable differences in thinking, he just assumed that they do.)

The study of infant cognition entered a new phase when a systematic object of research was found, i.e. when one hit upon the idea of studying the *direction and the duration of the infant's gaze*. These are taken to indicate the amount of attention; and the so-called habituation hypothesis assumes that for an infant it takes a shorter time to look at what is familiar or comprehensible, and a longer time to look at what is unfamiliar or incomprehensible. A series of imaginative tests that provide detailed information about infant cognition have already been built upon this apparently slender foundation.

The physical world-view of 4-month-old children is in its basic structure already the same as that of speaking adults. Central to everything else is the notion of *thing*, which is characterized by cohesion, substantiality, continued existence, and continuity of movement. It is also important to note that the notion of thing is abstract enough to be independent of any particular sensory modality (e.g. vision or touch). The adult world-view is reached not by changing, but merely by enriching the infant world-view, for instance, by adding the operation of gravitation and the principle that things move at constant or gradually changing speeds (cf. Spelke 1988). Causation is already at this age distinguished from mere spatio-temporal contiguity (cf. Leslie 1988). The habituation method also shows that the concept-formation by infants is similar to the concept-formation by adults (cf. Cohen 1988).

These results are of tremendous significance. They show that our standard notion of ontology comes into being without the aid of language. Language does not create reality, but merely reflects it. Plato and Aristotle were right, and those who were (or are) wrong, include nominalists like Ockham, romantics like Herder, linguistic determinists like Whorf, and postmodernists like Derrida.

In this context I cannot go into the eventual similarities between human cognition and animal cognition. From the linguistic point of view, however, it is quite interesting to note that a chimpanzee is able to identify

such semantic (or 'thematic') roles as 'agent', 'patient', and 'instrument' (Premack 1988:60). So these must be nonlinguistic in origin (which of course makes perfect sense).

Let us now return to the role of isomorphism in language learning, as exemplified by what might be considered the paradigmatic case, namely the 'thing-action vs. noun-verb' isomorphism. It is well known that this isomorphism is more pronounced in children's speech than in adults' speech (cf. Brown 1958:243-253), a result which agrees with the general 'iconicity' of the child language (cf. Slobin 1985). This clearly shows that the child does become (subliminally) aware of the language-reality relation. He does not just learn the language of the adults. Rather, he also learns and uses language to satisfy his perceptual and cognitive needs. That he only later starts using nouns for non-things, is implicit proof that he thereby recognizes the distinction between the primary use and the secondary one.

The preceding account is directly confirmed by evidence from the study of home-sign systems, i.e. gestural means of communication invented by deaf children of hearing parents. These children use 'pointing gestures' to refer to things and 'characterizing gestures' to refer to actions and qualities (cf. Golden-Meadow & Mylander 1990). The ontological justification of this distinction as well as its virtual identity with the noun-verb distinction is self-evident.

If the iconic nature of home-sign systems is obvious, the same is no less true of such well-established sign languages as the American, or the British, or the Finnish sign languages.⁴ Even if the iconic origin of particular signs may have become opaque, the structure of the entire language is nevertheless based on the idea of modelling the reality which is spoken about. That is, the space in front of a signer is a miniature model of the world, and 'place-holders' for real-life entities are first put in it, and then pointed at and moved around in accordance with the exigences of the story to be told. Moreover, the iconic roots of grammatical (rather than lexical) morphemes are often evident also to people with no previous knowledge of signing. This is vividly illustrated by the fact that, when asked to manually express such aspectual notions as 'momentaneous', 'iterative', 'durative' and the like, non-signers produce gestures that closely resemble the corresponding grammatical markers of standard sign languages (cf. McNeill 1987:248).

The preceding account may be summed up by saying that oral languages and sign languages have come to look very much alike, once it has been realized that the former are more iconic, and the latter more conventional, than was previously thought to be the case. Therefore it is not surprising that scholars of quite different persuasions agree that oral languages and sign languages issue from a common linguistic capacity (cf. e.g. Kyle & Woll 1985, on the one hand, and Poizner, Klima & Bellugi 1987, on the other). The implications of this general agreement must be clearly understood. It is impossible to deny that sentences uttered in a sign language give a 'picture' of the events spoken about; this 'picturing relation' is an isomorphic relation, or a relation between two (visual) structures. Now, if oral languages and sign languages do share a common origin, as is generally agreed today, then isomorphism must play an equally central, and equally explanatory, role in oral languages as it does in sign languages.

To me it is quite clear that home-sign systems too are an outgrowth of the same general capacity as oral languages and sign languages; and I do not think that this position would be contested by very many people. What is more controversial, however, is the status of spontaneous gestures that accompany, rather than replace, speech. McNeill (1985) notes that one part of such gestures 'iconically' replicate the semantic content of speech, while another part replicate the rhythmic pattern of speech. On the basis of this remarkable parallelism, McNeill argues that both speech and gestures simultaneous with it derive from the same capacity: they express the same conceptual content in different ways, gestures being the more primary mode of expression. For my part, I find McNeill's argument quite convincing. It remains to be seen how far this 'semiotic' competence ultimately extends.

Ever since Furth (1966), it has been known that there is no noticeable difference between the cognition of hearing subjects and the cognition of deaf subjects. Some people might wish to explain this fact by the common origin of oral languages and sign languages. This interpretation, however, is ruled out by the fact that preverbal children already exhibit the same type of cognition. Thus, as noted above, language has nothing to do with it.⁵

The preceding discussion supports Kosslyn's (1980) view that at least some part of mental representations is imagistic, rather than propositional, in character. A rising hand movement representing the rising

movement of an airplane is literally an *image*, or a picture, of the latter; and it is natural to think that the two instances of this movement are mediated by a mental-imagistic representation of the same movement. It would be less parsimonious to assume that the extramental movement has to be encoded in a mental-propositional form. (Notice also that the conceptual difficulties connected with 'images in the head' are no more serious than those connected with 'sentences in the head'.)⁶

4. ISOMORPHISM AS A SPECIAL CASE OF ANALOGY

Most contributors to Helman (ed., 1988) define analogy as 'structural similarity'. Given that this is also the standard definition of isomorphism, it is natural to ask what is the relation between these two notions.

Analogy, or analogical thinking, may be taken either in a dynamic or in a static sense. Taken dynamically, analogy means inferring something new from something old on the basis of a similarity between the two. Taken statically, analogy pertains to the results of previous analogical inferences. It means mastering a body of knowledge on the basis of similarities that hold within it.

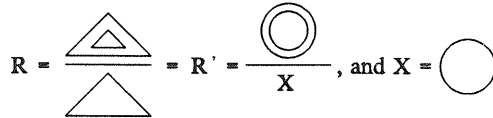
In a typical analogy, Hesse (1963) detects the dimensions of contiguity (or co-occurrence) and of similarity. I reproduce her example from p. 68:

	similarity	
conti- guity	BIRD	FISH
	wings	fins
	lungs	gills
	feathers	scales

This represents a (static) body of knowledge held together by analogical relationships, but it can be 'dynamicized', for instance, by adding 'legs' to the 'bird' properties, and then inferring that the 'fish' counterpart is 'tail'. Notice in particular that there is no necessity for the 'vertical' relation of contiguity to be binary, as is the case in the traditional 'proportional analogy'. For convenience, however, I shall mainly deal with binary vertical relations. As for the 'horizontal' relation of similarity, it must always be taken in a structural sense, i.e. as holding between two (or more) *relations*. But depending on the case at hand, it may also be taken

in a material sense. (In our example, lungs and gills are materially similar.)

An example taken from Kedar-Cabelli (1988:73-75) illustrates well the sense in which an analogical inference is also a *generalization*:



R = 'remove the small triangle from inside the large triangle', and R' = 'remove the small object from inside the large object'. The generalization consists in moving from R to R'.

Next I shall give examples of how analogy operates in three distinct areas, namely within extralinguistic reality, between extralinguistic reality and language, and within language.

4.1. Extralinguistic Reality

The properties of co-occurrence and succession, and in particular the causal properties, of things and events are learned on the basis of analogy. This is how we learn, for instance, that all ravens are black, that the day is always followed by the night, and that (every instance of) fire is hot:⁷

raven-1/black-1 = raven-2/X, and X = black-2

day-1/night-1 = day-2/X, and X = night-2

fire-1/hot-1 = fire-2/X, and X = hot-2

Next there follows an analogical generalization (or 'inductive inference'): All ravens observed so far are (have been) black → All ravens are black; and similarly in the other cases.

Once analogical inferences like these have been performed, their results simply constitute our knowledge of the external world. It is important to realize that the same pattern of thought applies both to what is the most simple and to what is the most complex. Just compare the above examples with the following:

stimulus/process/response = input/program/output
 mind/brain = software/hardware
 sun/planets = atomic nucleus/electrons

It is also well known that the world views of so-called primitive cultures can be summed up as long chains of oppositions between which some analogical relationships, often of a purely arbitrary or normative nature, are perceived. Consider (part of) the Chinese opposition between *yin* and *yang*:

yang/yin = light/dark = man/woman = up/down = front/
 back = convex/concave = ...

Similar normative analogies obtain also in Western thought, for instance:

father/children = state/citizens
 animal/human = human/God

Finally, the ubiquitousness of analogical thinking is well illustrated by the analogies between distinct ontological categories, for instance:

two miles/four miles = two hours/four hours = two dollars/
 four dollars

Similarly, the urge to analogize (as it might be called) is particularly evident in the analogies between distinct sensory modalities, for instance:

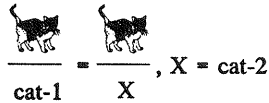
rising movement/falling movement = 'rising' tone/'falling'
 tone

There are an innumerable number of similar examples. Just think of warm vs. cold drinks or voices or colours. Thus, *metaphor* is a prime example of analogy.

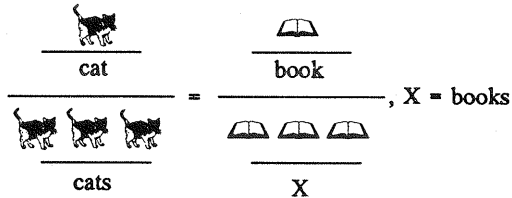
4.2. Extralinguistic Reality and Language

It is a well known fact that, in the beginning, children learn the meanings of only those words whose referents are present when they hear (or see) the corresponding word-forms.

This fact can be readily represented by means of an analogical inference; and what is more, this is the *only* way that it can be represented:

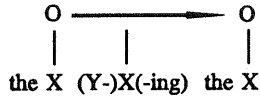
$$\frac{\text{cat-1}}{\text{cat-1}} = \frac{\text{X}}{\text{X}}, X = \text{cat-2}$$


This is how the first lexical morphemes are learned; and the grammatical morphemes are learned in the same way, except that, instead of holding between co-occurring referents and word-forms, the relation of similarity now holds between relations of co-occurrence between referents and word-forms:

$$\frac{\frac{\text{cat}}{\text{cat}}}{\text{cats}} = \frac{\frac{\text{book}}{\text{book}}}{\text{X}}, X = \text{books}$$


The distinction between present and past, for instance, although more difficult to picture, is learned in the same way.

Next, let us see how the distinction between the major word-classes, i.e. noun and verb, is learned. The ontological justification for this distinction is not in serious doubt (cf. Brown 1958:243-253). The isomorphism between a paradigmatic state of affairs and a schematic sentence structure might be represented as follows. (The circles stand for things and the arrow stands for an action.)



That is, a noun, i.e. the word referring to a thing, is whatever is preceded by *the*, and begins or ends the sentence, whereas the verb, i.e. the word referring to an action, is whatever occurs in the second position and may or may not be preceded by something (= Y, or auxiliary verb) and followed by *ing*.

The examples from Section 2 that testify to the isomorphic relation between language and extralinguistic reality may now be reformulated in analogical terms as follows:

- a) Number: thing-1/action/thing-2 = word-1/word-2/word-3
- b) Qualitative properties: thing/action = noun/verb; agent/patient = subject/object
- c) Quantitative properties: one/many = zero morph/non-zero morph; ontological entity/its opposite = lexical (i.e. long) morpheme (traditionally, *catagoremata*)/grammatical (i.e. short) morpheme (traditionally, *syncatagoremata*).
- d) Order: first event/second event = first clause/second clause; where the action starts (i.e. agent)/where the action ends (i.e. patient) = preceding word (i.e. subject)/following word (i.e. object)
- e) Cohesion: A causes B/A does not cause B = tight construction/loose construction; ontological whole/ontological part = expression that can be moved/ expression that cannot be moved

Finally, it may also be interesting to see how Aristotle's very influential view of the 'language-mind-reality' triad is expressed analogically:

written language/spoken language = spoken language/mind =
mind/reality

In the three cases, the vertical relation, which is tantamount to 'A expresses B', is taken to be identical, and not just similar.

4.3. Language

The identity of phonemes is established on the basis of analogy, although this may not be obvious at once. The following examples give an idea of the analogical relationships that underlie the distinctive features, which, taken together, constitute the phoneme /b/ (cf. Householder 1971: 65-67); that is, /b/ is contrasted with /p/, /d/, and /f/ in different environments:

bet/pet = bad/pad = ...; bin/din = bow/dough = ...; bill/fill
= base/face = ...

It is only at this phonological level that intralinguistic analogy may be characterized as 'formal'. This fact is obscured by the common practice of leaving meaning implicit, like here:

boy/boys = girl/girls

What is wrong with this (traditional) manner of presentation becomes evident from the following nonsensical analogy:

boy/boys = enjoy/enjoys

This analogy is unacceptable because of meaning, not because of form. (In effect, there is a remarkable formal, or material, similarity between units on both sides of the equality sign.) Therefore meanings, more precisely, *grammatical* meanings, must be made explicit, like this:

<u>Noun sg.</u>		<u>Noun sg.</u>		<u>Verb</u>
boy	=	girl	≠	enjoy
<u>Noun pl.</u>		<u>Noun pl.</u>		<u>Verb sg.</u>
boys		girls		enjoys

This example, simple as it is, suffices to show that outside of phonology it is misleading to speak of an 'intralinguistic' point of view. 'Noun' and 'verb' are grammatical meanings that are expressed by corresponding forms; but we have seen above that these meanings are ontologically motivated in that they correspond to the categories of 'thing' and 'action'. Therefore an 'intralinguistic' point of view is an illusion. The extralinguistic reality necessarily forces its way into language. (This is not to deny that linguistic form, or 'syntax' in a wide sense, can be treated *as if* it were autonomous. All one has to do is remember that this is a case of make-believe. Syntax *is not* autonomous, but for descriptive purposes we can *pretend* that it is.) What is true of noun and verb, is even more obviously true of such grammatical meanings as 'singular' and 'plural', because they are *identical* with, and not just motivated by, ontological categories.

In linguistics, the best known applications of analogy have traditionally been in inflectional morphology, both in synchronic and in diachronic studies. Here the vertical relation typically holds between the grammatical cases (eight in Sanskrit, three in Classical Arabic, for instance) or between the grammatical persons (nine or six, depending on whether or not the language in question possesses the dual). The horizontal relation, in turn, holds between the different declensions and, within each, between singular (and dual) and plural, or between the different conjugations and, within each, between the different tenses and/or modes. This aspect of analogy has been insightfully studied in Anttila (1977:Ch. 2).

In syntax, analogy establishes both the basic units (i.e. phrases and clauses) and the operations performed thereupon. In its first-mentioned capacity, analogy is indistinguishable from the traditional 'substitution test'. I give here only what might be called the paradigmatic example:

$$\frac{\text{John}}{\text{ran away}} = \frac{\text{My oldest brother}}{\text{has bought a new house}} = \dots \text{ or } \frac{\text{NP-1}}{\text{VP-1}} = \frac{\text{NP-2}}{\text{VP-2}}$$

The role of analogy in syntactic operations may be illustrated by converting assertions into questions:

$$\frac{\text{A did B}}{\text{What did A do?}} = \frac{\text{C did D}}{\text{What did C do?}} = \dots \text{ or } \frac{\text{assertion-1}}{\text{question-1}} = \frac{\text{assertion-2}}{\text{question-2}}$$

Or by showing how pairs of simple clauses are converted into compound sentences:

$$\frac{S-1, S-2}{\text{if } S-1, \text{ then } S-2} = \frac{S-3, S-4}{\text{if } S-3, \text{ then } S-4} = \dots$$

5.2. More examples of analogy in syntax will be given in the subsection

Our discussion has so far vindicated the traditional line of thinking (represented by Paul, von der Gabelentz, de Saussure, Jespersen, Sapir, and Bloomfield, among others) according to which both the learning of existing linguistic structures and the creation of new ones are based on analogy:

"Bei dem natürlichen Erlernen der Muttersprache ... hören [wir] nach und nach eine Anzahl von Sätzen, die auf dieselbe Art zusammengesetzt sind und sich deshalb zu einer Gruppe zusammenschliessen ... und so wird die Regel unbewusst aus den Mustern abstrahiert" (Paul 1975 [1880]).

"La création qui ... est l'aboutissement [de l'analogie] ne peut appartenir d'abord qu'à la parole; elle est l'oeuvre occasionnelle d'un sujet isolé. ... L'analogie nous apprend donc une fois de plus à séparer la langue de la parole; elle nous montre la seconde dépendent de la première... Toute création doit être précédée d'une comparaison inconsciente des matériaux déposés dans le trésor de la langue où les formes génératrices sont rangés selon leurs rapports syntagmatiques et associatifs [= paradigmaticues]" (de Saussure 1962 [1916]).

"...we feel that the two sentences ... are analogous, that is, they are made after the same pattern... Now, how do such [sentence] types come into existence in the mind of a speaker? ... from innumerable sentences heard and understood [the child] will abstract some notion of their structure which is definite enough to guide him in framing sentences of his own,..." (Jespersen 1965 [1924]:19).

"New words may be consciously created from these fundamental elements on the analogy of old ones, but hardly new types of

words. In the same way new sentences are being constantly created, but always on strictly traditional lines. ... The fact of grammar, a universal trait of language, is simply a generalized expression of the feeling that analogous concepts and relations are most conveniently symbolized in analogous forms" (Sapir 1921:37-38).

"...the speaker who knows the constituents and the grammatical pattern, can utter [speech forms] without ever having heard them;... A grammatical pattern ... is often called an analogy" (Bloomfield 1933:275).

We have also found support for Householder's (1971:75) view of a "vast network of analogies which is sparking in our brain every time we speak". Given the ubiquitous character of analogy, there is only one plausible option, namely to accept the conclusion that "language is one manifestation of the *innate faculty of analogizing*, shown clearly by children even before they have acquired language" (Anttila 1989 [1972]: 105; emphasis added).

5. AGAINST CHOMSKY'S NOTION OF UNIVERSAL GRAMMAR

The Chomskyan tradition entertains a notion of universal grammar that strongly differs from the one presented above. This disagreement also entails quite dissimilar views concerning the makeup of the human mind. Thus, this discussion goes beyond linguistics, and should ultimately be seen as part of *cognitive science*.

Having justified my 'analogue' notion of universal grammar, I shall now proceed to expose what I consider the weaknesses of the alternative Chomskyan notion.

5.1. Analogy vs. Modularity

Fodor (1983) argues for a dualistic model of the mind: on the one hand, innate domain-specific input systems or 'modules' (e.g. vision or language) which are 'informationally encapsulated' in the sense of operating independently of other modules; on the other hand, the central system which manipulates the information provided by the modules and is,

above all, characterized by *analogical reasoning*. It is Fodor's claim that only the modules can be (or become) objects of scientific investigation. Because the central system is responsible for creative thinking, it will always remain a mystery: "The more global a cognitive process is, the less anybody understands it. *Very* global processes, like analogical reasoning, aren't understood at all" (p. 107).

Fodor is merely giving here some content to Chomsky's (e.g. 1980) view that language is just one 'mental organ' among others. Moreover, the distinction between the modules and the central system is just a re-formulation of Chomsky's (1976) distinction between 'problems' and 'mysteries'.

It has been noted even by adherents of the modularity hypothesis that Fodor seems to have a rather unprecise idea of what modules are really like. It does not make sense to contrast vision and language, because this would mean that reading and writing (not to speak of sign languages) are not part of 'language'. Moreover, language cannot be identified with an input system, for the simple reason that people also speak, i.e. produce output.

In any event, it is clear that if the conception outlined in the four preceding sections is correct, it refutes the modularity hypothesis. Language cannot be modular, if it is motivated from outside, i.e. if, as I put it somewhat figuratively, "extralinguistic reality forces its way into language". For the same reason, language cannot be innate; being innate is incompatible with being causally explained by something else, as the Modistae clearly understood.

Fodor ignores all the evidence that was adduced (or alluded to) in the preceding sections. In addition to refuting the modularity hypothesis, this evidence shows that the existence of analogy, or of analogical reasoning, is incontestable. The modularist still has the option of postulating several domain-specific analogical capacities, but it would be unnecessarily uneconomical to do so. (Shacter et al. 1988:269 use the same argument to postulate a common mechanism for conscious experiences of perceiving, knowing, and remembering.)

It may be added that Fodor is no less one-sided in presenting his own evidence for the modularity hypothesis. He depends heavily on Liberman et al.'s (1967) thesis that hearing speech is a capacity distinct from hearing other sounds. This thesis, however, has been disconfirmed by recent research (cf. Schouten 1980 and Kuhl 1981).

If analogy really is as pervasive as I have claimed here, how is it possible that Chomskyans have been able to do without it? The answer is that they haven't. Jackendoff (1987) postulates the existence of 'preference rule systems' which have to decide whether, given the entities X and Y, a new entity Z is *similar* to X or to Y (i.e. whether it belongs to the category 'X' or to the category 'Y').

"Once the basic nature of preference rule systems has been isolated, it is possible to recognize them everywhere in psychology. The content of the preference rules varies widely from one domain to the next, but the characteristic computational interaction appears in every case" (p. 145). "Thus, preference rule systems appear to be an important building block of mental computation that cuts broadly across domains of all sorts, irrespective of the actual content of the domains" (p. 253).

It is immediately evident that what Jackendoff is really speaking of here is *analogy*, or analogical reasoning. The *conclusion* of such reasoning is precisely the choice (i.e. analysis or action) which the situation at hand makes preferable to other possible choices. Because of Chomsky's long-standing hostility towards analogy (cf. the next subsection), Jackendoff is forced to invent a clumsy neologism like 'preference rule system'. This is reminiscent of how, in the generative analysis of linguistic change in the early seventies, the term 'analogy' was replaced by the conglomeration of such terms as 'distinctness condition', 'levelling conditions', and 'paradigm coherence' (cf. Anttila 1977:98-99).

Jackendoff (1987) also rechristens metaphor as 'cross-field generalization'. He misses a generalization, however, when he fails to see that both 'preference rule systems' and 'cross-field generalizations' are just different aspects of a unitary phenomenon, namely analogy. In these respects, Jackendoff (1991) contains no improvement.

Nothing of what I have said so far is meant to deny that the sensory system performs very specific or, in this sense, 'modular' functions. Remember, however, that four-month-old children already possess a notion of 'thing' which is abstract enough to be independent of particular sensory modalities. It is at *this* level (and then, of course, at higher levels) that I claim analogy operates. As a consequence, when a child perceives the analogy between extralinguistic structure and linguistic structure, this is in

a sense an 'abstract' analysis. But it would be nonsensical to argue, with Fodor, that this analysis, just because it relies on analogy, is so abstract or 'mysterious' that nothing can be known about it.

5.2. A Critique of Chomsky's Notion of Analogy

Chomsky has always consistently denied the usefulness of "such ideas as analogy, induction, association, reliable procedures, good reasons, and justification" (1986:12). His own position is that innate knowledge somehow takes care of everything. It needs to be pointed out, however, that Chomsky uses the term 'analogy' in a quite idiosyncratic way. Basically, his error is to treat analogy as a purely formal notion; given this point of departure, it is of course easy for him to prove that 'analogy' fails. But from this, nothing follows for the genuine notion of analogy.

Let us make this a little clearer. Chomsky (1986) uses repeatedly the following set of examples:

- (1) John ate an apple
- (2) John ate
- (3) John is too stubborn to talk to Bill
- (4) John is too stubborn to talk to

As he sees it, the relation of (4) to (3) is analogous to the relation of (2) to (1). And yet *John* is the subject of *ate* both in (1) and (2), while *John* is the subject of *talk* only in (3). Chomsky takes this to mean that analogy fails; and because analogy cannot explain why (4) is construed differently from (3), it follows (or seems to follow) that only some innate mechanism can do so.

Chomsky's argument here can be presented in the form of a proportional analogy, thus:

$$\frac{(1)}{(2)} = \frac{(3)}{X}$$

For Chomsky, the notion of analogy requires X to be replaced by (4). To see the error in this reasoning, consider the following proportional analogy:

$$\frac{(1) \text{ John ate an apple}}{(2) \text{ John ate}} = \frac{(5) \text{ John talked to Bill}}{\text{X}}$$

According to Chomsky's logic, X should be replaced by the following sentence:

(6) *John talked to

This is wrong, however, because (6) is not even a correct sentence.⁸ The right solution is, rather, this sentence:

(7) John talked

When we apply this simple observation to our first proportional analogy, we see that the solution cannot be (4). Rather, it has to be

(8) John is too stubborn to talk

What about Chomsky's key sentence, i.e. (4)? What is the *right* analogy for it? It is to be found in equations like the following one:

$$\frac{(9) \text{ The teacher discusses the question}}{(10) \text{ The question is too difficult to discuss}} = \frac{(5') \text{ Bill talks to John}}{\text{John is too stubborn ____}}$$

It is here – and *only* here – that the sentence (4) (= *John is too stubborn to talk to*) has its rightful place. Notice that there is not only a semantic, but also a formal analogy between (9)/(10) and (5')/(4), as one cannot help noticing, if one only cares to keep one's eyes open. This analogy *explains* Chomsky's original puzzle, i.e. why (4) is understood in the way it is: the role of *John* in (5') is the same as the role of *question* in (9); and since the latter remains the same in (10), so does the former in (4). John is the patient; he is not talking, he is being talked to.

I give two more examples showing how Chomsky misconstrues or neglects the genuine notion of analogy. Consider these sentences from Chomsky (1976:283):

- (11) John's friends appeared to their wives to hate one another
- (12) John's friends appealed to their wives to hate one another

According to Chomsky, a difference of only one sound, i.e. *r* in (11) vs. *l* in (12), separates these two 'analogous' sentences. And yet *one another* refers to *friends* in (11) and to *wives* in (12). Once again, this is taken to mean that analogy is useless and the postulation of very specific innate knowledge is unavoidable. But (11) and (12) are *not* analogous, witness the difference between the following sentences:

- (13) John appears to be sleeping
- (14) *John appeals to be sleeping.

Finally, consider the example from Chomsky (1980:178-179):

- (15) Mary bought a dog to play with

He notes quite correctly that we all know Mary, and not the dog, to be the subject of *play*. Since there cannot, presumably, be any evidence to support this knowledge, an innate universal (= something called 'minimal distance principle') needs to be postulated. This is quite unnecessary, however. All one has to do is consider an *analogous* sentence like

- (16) Mary bought a ball to play with

It is the *meaning* of the sentence which makes it clear that Mary must be the subject of *play* (since balls cannot play). From cases like (16), this interpretation is *generalized* to (analogous) cases like (15).

As a proponent of a language-specific innate capacity, Chomsky feels under no obligation to present an algorithm for language-acquisition. He has always claimed, however, that supporters of analogy do have such an obligation. But why? Like Anttila, I am free to postulate a non-specific

innate capacity to grasp analogies; and if the innatism of one sort does not entail any commitment to a language-acquisition algorithm, the innatism of the other sort does not either. This is directly confirmed by Jackendoff's (1987) position. He makes it quite clear that he will not (and cannot) mechanize analogy (or what he calls 'preference rule systems'). I agree. We are just guided by our *non-specific* innate knowledge to perceive the right analogies. (This is not to belittle the value of the various approximations to analogy algorithms presented in Helman [ed., 1988].)

It is well known that in his grammar-conception Chomsky concentrates on the formal or syntactic aspect of language. Therefore it was only to be expected that he should misconstrue analogy as a purely *formal* phenomenon. It is nevertheless somewhat surprising to see how far his antipathy towards meaning extends. Matthews (1989:61) speaks of "Chomsky's reluctance to include semantic information" among the data which are the input to the language-acquisition device. Accordingly, Lasnik (1989) tries to show that nothing beyond *distributional data* is needed. The implication is that it should be possible for someone to learn a language just by listening to spoken utterances, without any other, either visual or tactile contact with the extralinguistic reality (including other people). The falseness of this assumption is evident from the fact that it is impossible to learn a language by listening to the radio (cf. Sachs & Johnson 1976), or even by watching the television (because the referents, even if visible, are not really *present* to the child) (cf. Snow et al. 1976).

5.3. The Vacuity of the 'Poverty-of-Stimulus' Argument (or the Non-Problem of 'No Negative Evidence')

Although unexplained and unexplainable, the Chomsky-type universal grammar is not meant to lie altogether outside of the explanatory process. Rather, it is invoked to explain the fact of language-acquisition. That is, language is claimed to be acquired 'very rapidly' on the basis of 'limited' and 'degenerate' data. Presumably, the 'stimulus' which the child comes across is so 'poor' that he could not learn his native language so rapidly (or could not learn it at all), if he were not aided by a specifically linguistic innate faculty. Thus, the need for innate universal grammar is justified by this 'poverty-of-stimulus' argument.

Here we face an extraordinary situation. In non-linguistic circles the Chomskyan generative school is often identified with linguistics *tout court*.

And yet perhaps one half of the linguistic community flatly denies the existence of the very fact which the Chomsky-type universal grammar is summoned to explain. In other words, they deny that language is acquired rapidly (cf. Sampson 1980:114), and that the data encountered by the language-learning child is either degenerate (cf. Labov 1972:203) or limited (cf. Schlesinger 1975:219). That such a basic disagreement is possible at all, proves that the foundations of linguistics are much less secure than we generally like to think.

More recently, the 'poverty-of-stimulus' argument has been reformulated in rather extreme terms. Now it is claimed that language is learned on the basis of not just *limited* data, but of *no* data at all. More precisely, it is claimed that, in order to learn his first language, the child needs to know that some forms are *not* correct; but since he obviously has no 'negative' data that would directly tell him this, he must possess the requisite knowledge 'in advance'. Thus, innate knowledge is invoked once again. – Let us see what is wrong with this argument.

Consider the following proportional analogy:

(1) Dad told a story to Sue	=	(3) Dad said something nice to Sue
(2) Dad told Sue a story	=	(4) *Dad said Sue something nice

The problem of 'no negative evidence' is simply this: How does the child know that sentences like (4) are incorrect, without being explicitly told about their incorrectness? That is, how does he learn to block the 'false analogy' exemplified by the above sentences? Notice that this case, which involves a coexistence of two correct structures (1) and (2), is, at least on the face of it, more difficult to explain than the standard type of morphological exception, for instance:

hand/hands = foot/feet (*foots)

Here there is only *one* correct form in each case; and *feet* is a 'positive' exception, i.e. it occurs although it should not, whereas (4) is a 'negative' exception, i.e. it does not occur although it should (for more discussion, see Bowerman 1988 and Lasnik 1989).

Now, the first thing to notice about this example is that it has nothing to do with innate linguistic principles of any sort. Rather the

variation between *tell* and *say* (or *give* and *donate*, or *show* and *demonstrate*) is purely a matter of the English language. Yet it is simply a fact that the child does learn to say (2) and to avoid (4). And since he learns this case without the aid of innate linguistic principles, there is no *a priori* reason to assume that he would need such principles in learning other cases (for instance, cases involving the Wh-movement). When this is clearly understood, it is also seen that the elaborate discussion reviewed in Bowerman (1988) has practically no relevance to the issue of universal grammar.⁹

There still remains a legitimate question concerning language-particular learning: how, precisely, does the child learn such idiosyncrasies of English like the variation between *tell* and *say*, or the quite subtle variations enumerated by Bowerman (1988:90–93)? The detailed answer must be left to child-language experts, but at least the general answer is clear: It happens on the basis of positive evidence and without innate linguistic principles. Those who have doubted the child's ability to learn on the basis of positive evidence, have simply underestimated the powers of innate analogical reasoning. It tells us not only which analogies to accept, but also which *not* to accept.

It is quite amazing to see that the Chomskyan paradigm is supported by practically no data concerning language-acquisition, in spite of the fact that it is precisely language-acquisition which is supposed to provide its *raison d'être*. Arguments are constantly justified by nothing but subjective impressions (more precisely, subjective impressions of a sceptical nature), i.e. by claiming that it is 'not plausible' or 'hard to imagine' or 'difficult to believe' that the child could do such-and-such. But other linguists, myself included, have found all this quite plausible, or easy to imagine. In a situation like this, the only rational course of action is to forget the 'logical' problem of language-acquisition and to find out what the child *really* can or cannot do.

I have already illustrated this 'sceptical' type of argumentation in the subsection 5.2, where I showed how Chomsky has managed to overlook all evidence that might enable the child to understand the meanings of 'John is too stubborn to talk to' and 'Mary bought a dog to play with' as well as the structural difference involved in 'John's friends appeared/appealed to their wives to hate one another'. Here I shall add two more examples, taken from Hoekstra & Kooij (1988:37–38).

Consider the following expressions:

- (5) He proved the theorem
- (6) His proof of the theorem
- (7) He proved the theorem wrong
- (8) *His proof of the theorem wrong
- (9) His proving the theorem wrong
- (10) His destroying the city single-handed

How do we know that (9) is correct and (8) incorrect? According to Hoekstra and Kooij, "it is plausible" that this knowledge "is ultimately based on knowledge of principles of UG". Why? – because thinking otherwise would entail two implausible assumptions, namely that we are able to keep track of the patterns we have or have not encountered (= the non-occurrence of patterns like [8]), and that we are able to generalize a pattern from one construction (= [9]) to another (= [10]). – In opposition to Hoekstra and Kooij, I submit that these two assumptions are self-evident, rather than implausible.

Again, consider these two sentences:

- (11) Where did John say that we had to get off the bus?
- (12) Where did John ask whether we had to get off the bus?

(12) can be understood only in one way, whereas (11) has two interpretations, namely as asking either about the place where John said what he said or about the place where we had to get off the bus. How do we know this difference? – according to Hoekstra and Kooij, because we have "access to complex principles of UG". Why are they needed? – because "this piece of knowledge [, although] shared by all native speakers, ... can hardly have been established on the basis of induction [or analogy]". Why? – "simply because there are no data from which induction could conceivably proceed". But of course there are precisely such data, and self-evidently so. The first interpretation of (11) is understood *in analogy* with straightforward questions, for instance:

- (13) Where did John sleep?

The second interpretation of (11) is in turn understood *in analogy* with questions containing *that*-clauses, for instance:

(14) Who do you think that John will marry?

Both (13) and (14) have only one interpretation. (11), containing both *where* and *that*, has two interpretations.¹⁰ (12), again, can be understood in one way only. (One sometimes has the feeling that the Chomskyans do not trust the speaker to piece together the meaning of any single sentence without 'outside help', i.e. without help from UG.)

The 'poverty-of-stimulus' argument might seem the more convincing, the less data is claimed to be accessible to the child. Thus it is, in a sense, logical that, as we saw above, Chomsky is reluctant to include semantic information among such data. Similarly, Matthews (1989:68) excludes the possibility of ontological information: "The learner is not going to be able to induce the constraints [on the class of possible grammars] from nonlinguistic data for the simple reason that such data do not exhibit them."

If Matthews were right, it would be senseless to speak of an isomorphism between extralinguistic structure and linguistic structure, because the extralinguistic reality would be essentially structureless. But he is not right. This is shown by research on nonlinguistic cognition, research that he completely ignores (cf. the reference to Spelke [1988] and others). Others working within the Chomskyan paradigm are better informed. Finer and Roeper (1989) fully accept the existence of nonlinguistic cognition and investigate its relation to semantic (or 'thematic') roles. More interestingly, Jackendoff (1987:250-251; also pp. 174-185) notes identical, or strongly similar, hierarchical structures in syntax and in the visual '3D model' of the extralinguistic reality that was developed by David Marr. It is structures of the latter type, extended from single objects to states of affairs, which constitute the basis for the language-reality isomorphism.

5.4. The Vacuity of the Innateness Hypothesis

In what precedes, I have presented the opposition between the two notions of universal grammar as that between two scientific theories equally liable to falsification. There are indications, however, that this may not be the correct interpretation. The Chomskyan camp shows inclinations to stretch the notion of innateness so as to absorb into it any new and *prima facie* disconfirmatory results which are too cogent to be sensibly denied. That is, what is first denied, is soon accepted and claimed to be

part of the universal grammar. It goes without saying that this is an *immunization strategy* of the most palpable sort. Consider the following examples.

Traditional linguistics has always relied on what Anttila (1972) calls the ('iconic') principle of 'one meaning – one form', and what I myself have called the 'principle of isomorphism' (cf. Itkonen 1982 and 1984).¹¹ Originally, this principle was incompatible with Chomskyan linguistics because the latter was syntax-centered to the point of assigning no role at all to semantics. In the long run, however, it proved impossible to deny the existence of the biuniqueness principle, which meant that it had to be incorporated into Chomskyan linguistics. In inflectional morphology, this was done by Pinker (1984) with his postulation of a 'unic entry' principle as part of universal grammar. The same change of mind is evident, even if to a lesser degree, in Chomsky's (1981) postulation of an isomorphism between 'thematic' and syntactic relations.

The ontologico-linguistic isomorphism is 'stronger' than the semantic-syntactic biuniqueness, because it is asymmetrical: it is the ontological or extralinguistic term of the relation which determines the other, linguistic term (in the sense defined in Section 2 above).¹² Therefore supporters of isomorphism (or 'iconicity') have always felt that their position is incompatible with Chomskyan innatism. This feeling is not, however, shared by all representatives of the Chomskyan paradigm. Thus, Pinker (1984) not only incorporates biuniqueness into universal grammar with the aide of his 'unic entry' principle; in addition, he sees no contradiction in incorporating isomorphism as well. That is, his 'semantic bootstrapping' hypothesis assumes that children are innately endowed with a set of correspondences between syntactic categories (e.g. N and V) and ontological categories (e.g. thing and action). By this conjuring trick, the achievements of functional linguistics are turned into achievements of formal, Chomskyan linguistics.

This is made even clearer by the following example. It has often been pointed out that Chomskyan linguistics by no means claims that each and every linguistic phenomenon is innate. Therefore it can be genuinely falsified only by providing functional explanations for those phenomena which it specifically claims to be innate. This observation is perfectly correct. Now, the phenomena of *structure-dependency* and *subjacency* are certainly at the very heart of Chomskyan linguistics; for years they have

been advertized as the securest universals of all, precisely because there are no explanations for them:

"There is no a priori reason why human language should make use exclusively of structure-dependent operations, such as English interrogation, instead of structure-independent operations [like the operation that inverts the first and last words of a sentence]" (Chomsky 1968:52).

"... the universals that rationalists typically cite (the structure-dependency, the subjacency condition, etc.) are certainly unexpected and nonintuitive,..." (Matthews 1989:69).¹³

But now it seems that the times are changing. Newmeyer (1990) frankly admits that there are in fact quite plausible functional explanations for the two phenomena. But if you think that this means that Chomsky's universal grammar has been falsified, you just don't know how the game of linguistics is being played. According to Newmeyer, the functions that language may be shown to serve have promoted the survival of the human species; therefore they have become, via mutations, part of our innate language capacity; therefore, rather than falsifying Chomsky's universal grammar, they actually confirm it. – After reading this remarkable passage, I became convinced that there is nothing, absolutely *nothing*, that could make Chomskyans admit that there is anything amiss with their theory. This is why I am not writing these lines for them, but for those who have not yet committed themselves.

It is good to add that innateness lends itself quite naturally to being some sort of *deus ex machina*: when you do not know what to say about something, say that it is innate. For instance, when Katz (1981) defends his Platonism, he is confronted with the dilemma noted already by Aristotle: how is it possible that we, beings who live in space and time, come to know something that is beyond space and time, i.e. Platonic ideas? As you might have guessed, Katz's answer is that we are just innately equipped for it (cf. Itkonen 1983).

5.5 Chomskyan Linguistics: an Explanans in Search of an Explanandum

Once you have reached this point, you may have started to puzzle over the nature of Chomskyan linguistics: it is a psychological or even biological theory without any psychological or biological facts, a theory looking for universal features, but telling in advance that whatever it will find, is unexplainable. In my opinion, these puzzling aspects of Chomskyan linguistics can be understood, only if they are put in an historical perspective.

In his 1955 dissertation Chomsky was still a follower of Bloomfield and Harris. He defended the former's antimentalist program against suggestions that the criteria of scientific significance should be relaxed so as to admit non-physical entities as well:

"The fact that a certain general criterion of significance has been abandoned does not mean that the bars are down and that 'ideas' and 'meanings' become proper terms for linguistics. If this rejection of an old criterion ... is followed by a new analysis of 'significance', then if this is at all adequate, it seems to me that it will rule out mentalism for what were essentially Bloomfield's reasons, i.e., its obscurity and inherent untestability" (1975 [1955]:86).

It is Chomsky's goal to achieve a synthesis of Bloomfield's anti-mentalism and Harris' distributionalism at the level of syntax:

"The notions that enter into linguistic theory are those concerned with the physical properties of utterances, the formal arrangement of parts of utterances,... and finally, formal properties of systems of representation and of grammars... We will refer to linguistic analysis carried out in these terms as 'distributional analysis'" (p. 127), "this term [being] borrowed from Harris" (p. 63, n.1).

Chomsky (1957:55) also echoes Harris (1946:164, n. 6) in his claim that "the only ultimate criterion in evaluation is the simplicity of the whole system". So we see that, contrary to a wide-spread misconception, in its first explicit formulation Chomsky's linguistic theory did not embody any significant break with the preceding tradition. On this issue, the level of

historiographical writing, epitomized by Newmeyer (1982), has been extremely low.

In Chomsky (1965) the study of linguistic form, now supplied with a mentalist interpretation, was seen as a study of innate universal grammar. In Chomsky (1980) the innate linguistic faculty (or 'organ') was conceived of in ultimately biological terms, and its autonomy vis-à-vis other comparable faculties was justified by a general appeal to the modularity of mind.

In the present context it is of no importance that Chomsky's theory of syntax has undergone several modifications. What is important, is the fact that while he has continued to analyze the syntax of English by means of self-invented sentences which his own linguistic intuition deems correct, his interpretation of, and justification for, what he is doing has changed completely: he first practises antimentalist distributional analysis, then mentalist syntax as part of general psychology, and finally study of universal grammar as one aspect of biological endowment.

Once the generative syntax had been invented, something had to be done with it, i.e. it had to be used to 'explain' something. With the passing of time, the explanandum has been conceived of in increasingly ambitious terms: having started with distributional arrangements of English morphemes, we have now arrived at theoretical biology. Seen in perspective, innatism and modularity are not claims with empirical content. They are just excuses for Chomsky not to do anything different from what he has always done.

NOTES

1. Itkonen (1972) is the manuscript for a licenciate thesis which I had to withdraw.
2. In Itkonen (1970) I showed in some detail that isomorphism, in the sense of Wittgenstein's 'picture theory', is a feasible idea also for natural languages.
3. Hopper and Thompson (1985) try to show that the justification for the categories of noun and verb is ultimately not ontological, but 'discourse-pragmatic'. To my mind, they fail for the following two reasons. First, when dealing with their actual examples, they invariably return to the ontological justification. Second, saying, in the Aristotelian terms, that the verb and the noun express, respectively, that which is said and that about which it is said is not a *justification*, but merely a *definition* of the two categories. And the connection between the definiens and the definiendum is too close to be explanatory. (While it is easy to imagine a noun not referring to a thing, it is impossible to imagine a (subject) noun *not* expressing that which is spoken about.)
4. My discussion of sign languages has been influenced by Rissanen (1985) and Haukioja (1991).
5. There is an interesting analogy in the field of animal psychology: Premack (1988) reports that a chimpanzee who had been taught the signs for 'same' and 'different' was capable of more abstract thinking than those who had not been taught in the same way.
6. To be sure, Wittgenstein's cautionary remarks against the use of 'mental images' should not be forgotten: an image (e.g. a map) needs always an instruction for its use or interpretation; and how is *this* to be mentally represented? (Cf. Blackburn 1984:45-50.) It seems to me, however, that this is exactly the same problem as the one that Searle (1980) has raised concerning the mental language with his 'Chinese room' puzzle. Thus, as I noted in the text, mental images and mental sentences involve the same problems.
7. In presenting proportional analogies, I shall often use the following space-saving notation.

8. Maybe Chomsky would like to argue that (6) *should* be a correct sentence; that it is not, would then speak against analogy. But this is like arguing that analogy fails because *boy* and *enjoy*, though formally similar, belong to different word-classes.
9. To be sure, Bowerman's discussion has other merits. The Chomskyans, professing to be interested only in the 'logical' problem of language-acquisition, had been trying to explain the 'fact' that children do not perform syntactic overgeneralizations. But Bowerman shows that they do.
10. Of course, not all questions containing *that*-clauses are equally likely to be ambiguous; just think of a question like *Where do you believe that he lives?* It would be odd to answer *I believe it in my mind.*
11. Today, I prefer the term 'biuniqueness', reserving 'isomorphism' for the reality-language relation.
12. Although Saussure's and Wittgenstein's meaning-conceptions differ widely, they agree in considering form and meaning to be conceptually connected to each other. If this is accepted, there can be no 'semantic' (or 'logical') explanations of linguistic structure, of the type suggested e.g. by Keenan (1988); cf. also note 3 above. For such explanations to be viable, the 'semantic' or 'logical' elements must be reinterpreted in ontological or cognitive terms.
13. Personally, I have always found this view extremely puzzling, given the obvious functional explanations that can be given both for structure-dependency and for subjacency (cf. Section 2).

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