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REMARKS ON ANALOGY (Turku, October 2014)

0. Starting with a Few Relevant Quotations

Succinctly:

Von Humboldt in 1812: “alles in einer Sprache beruht auf Analogie”
Whitney in 1875: “everything in language goes by analogy”
Bolinger in 1975: “the idea that things can be different but the same is prerequisite to science”
Hofstadter in 1995: “analogy-making lies at the heart of intelligence”

More elaborately:

Paul (1975 [1880]): “Wir hören nach und nach eine Anzahl von Sätzen, die auf dieselbe Weise zusammengefügt sind und sich deshalb zu einer Gruppe zusammenschliessen. Die Erinnerung an den speziellen Inhalt der einzelnen Sätze mag dabei immer mehr verblassen, das gemeinsame Element [= common structure] wird durch die Wiederholung immer von neuem verstärkt und so wird die Regel unbewusst aus den Mustern [elsewhere: *Beispielen* = examples] abstrahiert“ (p. 111). “Diesen Vorgang nennen wir Analogiebildung“ (p. 110).

Bréal (1897): “Il faut entendre par [l’analogie] cette loi du langage qui fait que les formes déjà créées servent de modèle à des formes nouvelles …” (p. 227). “L’analogie … n’en est pas moins le vrai et nécessaire moteur du langage” (p. 75).

Householder (1969): “In the ordinary use of the term, analogizing is precisely and only what a linguist does in writing a grammar which purports to be a model of the speaker’s competence” (p. 889).

Anttila (1972): “Any system of grammatical description can be reduced to analogical terms based on the kind of relations used in each such system” (p. 88).

Derwing (1973): “Both Paul and Bloomfield linked their notion of linguistic creativity to a general principle of analogical formation” (p. 309). “We are talking about a notion of linguistic rule which can be directly extracted from surface structures … All that is required to learn rules of this sort are general capacities which human beings possess: power to discriminate, to generalize and, most importantly, to extract regularity from the environment. Consequently, this is the notion of linguistic rule which I have endeavored to resurrect for serious consideration” (p. 310).

1) The Contents of Zero Are Elicited by Analogy

Next, I shall show quite concretely (some of) the benefits that ensue from applying the analogical approach. The Yoruba morphosyntax is discussed at some length in Itkonen (2005a: Chap. 10). Now consider the following sentences:

(a-1) *ó rà á*	S/he bought it	
(a-2) *yó rà á*	S/he will buy it	FUT(ure)
(a-3) *ó nrà*	S/he used to buy it	HAB(itual)
(a-4) … *ó bá rà á*	(that/if) s/he might buy it	NON-F(active)
(a-5) *rírà l’ó [< ni ó]rà á*	S/he really bought it	FOC(al)
(a-6) *ó di rírà*	It was bought	PASS(ive)
(a-7) *kò rà á*	S/he did not buy it	NEG(ation)
(a-8) *ó rà á bí?*	Did s/he buy it?	Q(uestion)

In the Yoruba context, (a-1) is what Keenan (1976) calls the "semantically basic sentence" (= SBS). AG(ent) and PAT(ient) are expressed by *ó* and *à*, respectively, as well as by their mutual order. In adddition, (a-1) expresses (at least) the following grammatical meanings: (i) PRET(erite), (ii) COMPL(etive), (iii) FACT(ive), (iv) NON-FOC(al), (v) ACT(ive), (vi) AFF(irmative), (vii) ASS(ertion). The presence of (iv) is justified by the quite extraordinary frequency of the FOC construction with *ni*.

Remarkably, (a-1) achieves this feat without any 'dedicated exponents', i.e. any external (or 'visible') means of expression. So how do we know that (a-1) really expresses (i)—(vii)? By comparing (a-1), one by one, with sentences each of which uses a dedicated exponent to express a meaning opposite to or at least different from (i)—(vii). Above, the sentences (a-2)—(a-8) were chosen for this purpose.

It is evident at once that each of (a-2)—(a-8), when compared with (a-1), elicits one of the meanings (i)—(vii). This is the **structuralist principle** in a nutshell: each unit of a structure is what the others are **not**; or, as summarized by Spinoza: "Omnis determination est negatio". It was emphasized also by de Saussure (1962 [1916]): "dans la langue il n'y a que des différences". He in fact over-emphasized it, by adding that there are no "positive terms" at all, which does not make sense (cf. Itkonen 1991: 299).

How should this situation — seven meaning expressed by nothing at all — be conceptualized? The notion of **zero morpheme** might suggest the idea that the 'physical signal' *ó rà á* contains either seven ontologically real zeros each of which is dedicated to express its own grammatical meaning or one such zero which is in seven ways ambiguous. Now, the notion of zero morpheme certainly has its use (e.g. in connection with the SG vs. PL distinction), but in the present context it is just too artificial. Therefore it is argued in Itkonen (2013) that sentences like (a-1) should be thought to exemplify the **basic use** characteristic of sentences in each respective language. The Wittgensteinian connotations are fully intended: meaning **is** use.

How should all these data be described? One natural solution would be to set up a following kind of matrix (given here only in outline):

SBS	FUT	HAB	NON-F	FOC	PASS	NEG	ASS
a-1	a-2	a-3	a-4	a-5	a-6	a-7	a-8
b-1	b-2	b-3	b-4	b-5	b-6	b-7	b-8
c-1	c-2	c-3	c-4	c-5	c-6	c-7	c-8
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.

The slots of the matrix do not of course stand for actual sentences but for structural possibilities to be filled in by actual sentences. The meanings of the SBS could be either explicitly enumerated or directly read off the matrix (once its nature has been understood). All members *x-i* of each vertical column are structurally similar, which by definition means that they are **analogous** to each other. Moreover, all horizontal rows *x-1, x-2, x-3, …* are structurally similar, which means that they are analogous to each other 'on the next higher' level. This kind of matrix is the syntactic counterpart of the (morphological) Word-and-Paradigm model. It confirms the thesis of Itkonen (1991: 313-320, 2005: 2.3-9) that while analogy alone may not be sufficient, it nevertheless constitutes the core of grammatical description.

It might be objected that the above matrix has a limited use because such SBS's as (a-1), with zero expression for (i)—(vii), are likely to occur only in analytical languages. But this is not true. West Greenlandic, for instance, is a polysynthetic language with extremely rich verb morphology (cf. Itkonen 2005a: Chap. 8, esp. pp. 210-214), and yet the SBS is exactly as simple as in Yoruba: the sentence *pisi-vaa* ('s/he bought it') expresses nothing beyond the lexical meaning (=

pisi-) and the AG/PAT relation (= *-vaa*). It may be added the SBS in a synthetic language like Italian is even more 'minimalist' than in Yoruba (or West Greenlandic): the meaning 's/he buys it' is expressed by *lo compra*, with zero expression for anything except 'buy' and PAT.

The notion of basic use was clearly anticipated by the idea of "least amount of formatives" in Itkonen (2005b: 85). The context was the discussion, and justification, of the Word-and-Paradigm model as exemplified by Marcus Terentius Varro, elaborated by Hermann Paul, and endorsed by Bybee, Bauer, and Anderson (pp. 78-85).

Haspelmath (2010) has coined the term 'framework-free grammatical theory'. It does not seem far-fetched at all to suggest that, on one interpretation, this term applies to our analogy-based description, in agreement with the Anttila-quotation given at the beginning of this article (see also Sect. 3A below). Instead of being some sort of fiction or descriptive convenience, the (analogical) relations displayed by our matrix exist as a matter of fact, and their existence must be acknowledged by each and every grammatical description, regardless of any ulterior formalizations.

3) The Resurgence of Analogical Linguistics

As documented in Section 0, grammatical descriptions were traditionally thought to be governed by analogy. For instance, sentences that exemplify the same **type**, **pattern**, **structure**, or **construction** were taken to be analogous by definition. To give a concrete example, Jespersen (1924: 19) claimed that sentences like *John gave Mary the apple* and *My uncle lent the joiner five shillings* "are analogous, that is, they are made after the same [ditransitive] pattern. In both we have the same type. The words that make up the sentences are variable but the type is fixed." Sapir (1921) and Bloomfield (1933) used the term 'analogy' in exactly the same way.

Analogy is defined as structural similarity. Discovering or inventing an **analogy between** A, B, and C is therefore identical with establishing a structure common A, B, and C, which is in turn identical with making a **generalization over** A, B, and C. There are no non-analogical generalizations (cf. Itkonen 2005b: Section 1.4), perhaps apart from cases involving phenomena with no internal structure (like perceived color). Thus, generalizations were handled by analogy in traditional linguistics. How are they handled in contemporary linguistics?

A) Cognitive Grammar: Analogy = Schema

"Langacker equates the ability to generalize with the extraction of schemas …" (Tuggy 2007: 83). What are schemas good for? They are claimed to perform the function of "syntactic rules, phonological rules, diachronic rules, semantic rules, syllabic or word-level or phrasal rules, lexical rules, morphological rules and templates, phonological templates and patterns, case frames, and other such constructs" (p. 94). It is certainly no accident that the same claim has been made in Itkonen (2005b) for analogy: it is analogy which accounts for (or is at least indispensable for the description of) phonology (2.3), morphology (2.4), syntax (2.5), semantics (2.6), diachrony (2.7), and language acquisition (2.9). Moreover, Section 2.8 is devoted to exploring the analogy between oral languages and sign languages.

Is there some sort of discrepancy, or even conflict, between analogy-based descriptions and schema-based descriptions? Prima facie at least, this does not seem to be the case: "From the perspective of cognitive grammar these two approaches are effectively equivalent. If the notion of analogy is made explicit, and **if rules are conceived as schemas**, there is no substantial difference between analogical and rule-based descriptions" (Langacker 1987: 447; emphasis added). The upshot seems to be a tripartite identity 'analogy = rule = schema". This is indeed the correct result. Unfortunately, it has been marred by some gratuitous misunderstandings (cf. Subsection C below).

Let it be added that Fauconnier & Turner –type blending is also based on analogy, because only structurally similar wholes X and Y can blend so as to constitute a new whole Z (cf. Itkonen 2005b: 43-44). Moreover, the transition X > Y > Z clearly exemplifies, or is subsumed by, the venerable trichotomy 'thesis > antithesis > synthesis'.

B) Construction Grammar: Analogy = Construction

Goldberg (1995) starts by discussing the case where the ditransitive construction has been extended from its normal use (*John pushed the napkin off the table*) to a less normal one (*John sneezed the napkin off the table*). It is impossible to find a better example of analogy in syntax (cf. Itkonen 2005b: 98-99): the latter sentence has been produced by the speaker's wish to use the intransitive verb *to sneeze* on the analogy of transitive verbs like *to push*. This is the only natural way to explain how this sentence has come into being.

Goldberg (2006) claims that constructions result from making generalizations. Constructions are form—meaning pairs, which means that they cover morphology, syntax, and semantics, but **not** phonology. Goldberg is silent on diachrony. The bulk of her 2006 book is devoted to showing how and why **language learning** is based on generalizations, in other words, how and why language learning is based on analogy. Tomasello (2003: 144) is explicit on this point: "young children make analogies over whole utterances." This is true, of course. But he could not be more wrong when he continues: "in developmental psycholinguistics [the concept of analogy] has almost no history as applied to syntax" (p. 145). Since the end of the 19th century, each and every self-respecting linguist assumed the learning of syntax to be based on analogy, and nothing else (cf. Itkonen 1991: 287-290, 303-303, 2005b: 125-127). Of course, Tomasello is right if 'developmental psycholinguistics' is restricted to whatever happened in this field 1965-2000 during the generativist reign. But there is no reason to restrict the use of this term in such a way.

According to Goldberg (2006) **all** types of generalization, linguistic and non-linguistic alike, are described by **inheritance hierarchies**: the properties of higher-level structures or constructions are inherited by lower-level structures (but obviously not vice versa). On reflection, inheritance turns out to be the **converse** relation of (the kernel of) **learning**: learning involves an ascent from particular occurrences towards more and more abstract structures whereas inheritance involves a descent in the opposite direction.

C) Analogy = Schema = Construction

Let us demonstrate quite concretely the identity of analogy, schema, and construction. Consider the word pair *(the) ear vs. (to) hear*. Looking only at this very limited data, one might be tempted to postulate the following kind of schema or construction in English: *V = h-N*, i.e. verbs are formed by adding the prefix *h-* to semantically related nouns. But one only needs to consider the word pair *(the) eye vs. *(to) heye* to see that this schema or construction is a false one. Why? Because there is no such verb as **to heye*, which entails more generally that in English there is no prefix *h-*. Instead of speaking of false schemas or constructions, we can just as well note the following **false analogy**: *(the) ear : (to) hear = (the) eye : *(to) heye*. Thus, analogy, schema, and construction are just notational variants.

Surprisingly, this very argument, invented by Kiparsky (1974), was originally meant to show that analogy is a defective notion: it is "too powerful" because – as we just saw – it allows false analogies in addition to true ones. In the sequel, this argument was widely accepted, by Langacker (1999: 145) among others, but in reality it does not make much sense. It claims any descriptive device to be defective if it fails to produce all and only scientific truths. By the same token, it assumes that there is or should be an algorithm producing all and only such truths, which is nonsense. And in any case, what is here true of analogy, is true of schema and construction as well.

We have seen Langacker both accepting and rejecting analogy. Is there any reason for this vacillation? This seems to be the case. He may have been influenced by (perhaps subconscious) memories from his generativist youth when it was *de rigueur* to reject analogy *in toto*. Just consider the following claim: "Our ability to create and understand novel sentences can**not** be accounted for by any appeal to the human capacity of analogizing" (Langacker 1968: 21; emphasis added). Householder's response to this claim was quoted in Section 0: Insofar as the linguist can simulate the speaker's competence, including the ability to create and understand novel sentences, this is made possible – "precisely and only" – by his/her capacity of analogizing.

Let us add one more misguided criticism of analogy. According to Tuggy (2007: 111), "analogy is most clearly to be invoked where there is no pre-established schema to directly sanction the newly coined structure". The incoherence of this position cries out to be corrected. Why should X be called (nothing but) 'analogy' as long as it is not fully entrenched, and 'schema' as soon as it is entrenched? For no reason at all. During this entire process X remains the same, i.e. an analogy, and the only thing that changes is its degree of entrenchment. To designate only the first stage of this process as 'analogy' is just a ploy to **marginalize** it. But why should analogy be marginalized, in the first place? To connoisseurs of the human nature, the answer is only too obvious. Representatives of schema-based Cognitive Grammar have an ardent wish to extol the virtues of their own framework, but there is no convincing way to do so unless analogy is marginalized, i.e. unless its true role is concealed. Let us recall, however, that the central (= non-marginal) role of analogy has been argued for by Marcus Terentius Varro, von Humboldt, Whitney, Paul, von der Gabelentz, Sapir, Jespersen, Bloomfield, Householder, Anttila, and Derwing, not to mention any more recent names.

D) Analogy = Semplate (< Semantic Template)

Levinson & Burenhult (2009) have discovered a need to postulate the notion of **semplate**. What is it? Preliminarily, we have a semplate when units "drawn from different semantic subdomains … are **mapped to** the same abstract semantic template" (p. 154; emphasis added). For instance, the "distinction between three different types of physical object … is thus **reflected in** the distinction between intransitive and transitive verbs of certain kinds" (p. 153; emphasis added). To give another example, "lexical opposition of gender in nouns is **paralleled by** the same opposition in a different form class, namely motion verbs" (*ibidem*; emphasis added). To an expert it is obvious at once that Levinson & Burenhult (2009) are speaking of analogy, nothing else. This interpretation is confirmed by the close similarity of semplates and metaphors "allowing point-by-point analogies across domains" (p. 168). This is correct, except that it should be the other way around: analogies are primary vis-à-vis metaphors insofar as the latter are "analogies with added constraints" (Itkonen 2005b: 35-43). Furthermore, semplates are identified with "cultural models" such as "homologies" postulated by Lévi-Strauss (pp. 167, 172). Again, this is perfectly correct, except that the true meta-generalization implicit in all these data becomes visible only when homology is replaced by analogy, as argued in some detail by Itkonen (2005b: 166-175).

But then Levinson & Burenhult (2009) commit a fatal mistake: "semplates cannot be reduced to analogy, understood as a structural mapping between **two** knowledge domains" (p. 168; emphasis added). Why two? For absolutely no reason. It goes without saying that the ditransitive pattern or template is exemplified in English by an indefinite number of analogous sentences. By the same token, it makes no sense at all to restrict analogy to structural similarity between different knowledge domains. Of course, this can be the case, as shown by the wave-like structure exemplified by such (analogous) domains as water, sound, and light (cf. Itkonen 2005b: 16) or by the ubiquitous analogy between the human body and the universe (op. cit., pp. 169-170), but it certainly need not be the case, as already shown by the ditransitive sentences of English. Once again, we are witnessing the near-universal urge to **marginalize** analogy (cf. Sect. 3C).

4) Analogy in Generativism

A) Generativism Rejects Analogy

Next, let us consider the position that generativism has adopted towards analogy. As noted above, the traditional view has always been that the ability to **generalize** is identical with analogizing. In particular, the child has been assumed to learn to construct and understand new sentences on the analogy of those that s/he has already encountered: from the latter s/he abstracts a general pattern that s/he then applies to the former.

It is interesting to note that in his dissertation Chomsky still subscribed to the traditional view, using formulations that could have been – and in fact were – used e.g. by Bréal (cf. Section 0): "[We intend to develop] a method of analysis that will enable us to abstract from a corpus of utterances a certain structural pattern and to construct, from old materials, new sentences conforming to this pattern, just like the speaker does" (1975 [1955]: 131). When there is a pattern shared by several sentences, "the sentences conforming to this pattern" must be structurally similar, which by definition means that they are **analogous**. So far, everything would have been just fine, but then Chomsky changed his mind for no reason at all (cf. below). Now the ability to construct new sentences could no longer be explained by "any sort of 'generalization' known to psychology or philosophy" (1965: 58). "To refer to the processes involved as 'analogy' is simply to give a name to what remains a mystery" (1968: 30). "… there is little hope in accounting for our [linguistic] knowledge in terms of such ideas as analogy …" (1986: 12, repeated on p. 55 and 222).

For quite some time, the distrust of analogy remained just an article of faith, unquestioningly (and uncomprehendingly) repeated by younger generations of linguists (cf. Sect. 4F). When Chomsky finally tried to give some substance to it, he used e.g. the following examples (1986: Chap. 3). Consider the sentences (i) *John ate the apple* and (ii) *John is too stubborn to talk to Bill*. For Chomsky, if analogy is a viable notion, the elliptical versions of (i) and (ii) ought to be (iii) *John ate* and (iv) *John is too stubborn to talk to*. This is not the case, which presumably means that analogy fails; and therefore we must invoke some innate mechanism. To give a different type of example, consider the sentence (v) *Where did John say that we have to get off the bus?* We understand this sentence to be ambiguous, but since there is presumably no data on which this understanding could be based, we must again invoke some innate mechanism.

It is nearly self-evident, however, that analogy, if properly applied, solves both problems. The elliptical analogue of (ii) is not (iv) but *John I too stubborn to talk* (because there is no such sentence as **John talks to*), whereas the proper analogy for (ii) is provided by sentences like *The question is too difficult to discuss*. On the other hand, the ambiguity of (v) is explained by showing that it is simultaneously analogous to two distinct sentence-types, e.g. the latter members of these two sentence pairs: *John slept : Where did John sleep?* and *Bill said that John slept there : Where did Bill say that John slept?* Moreover, all these and related facts have been described to anybody's satisfaction by means of a PROLOG program (cf. Itkonen 2005b: 89-94, 203-220). Thus, analogy is no longer a "mystery" (as Chomsky claimed in 1968). It can be, and has been, formalized. Similar results have been achieved by researchers too numerous to be mentioned here. Kac (2008) offers an excellent summary of the general argument.

B) A Note on Scientific Progress

Let us recall that generativism had its origin in a quite specific analogy: "The idea of generative grammar emerged from an **analogy** with categorical systems in logic. The idea was to treat grammaticality like theoremhood in logistic systems and to treat grammatical structure like proof structure in derivations (Katz 1981: 6 emphasis added; quoted and discussed in Itkonen

2005b: 17-19). In axiomatic logic, a distinction is made between well-formedness and validity (= theoremhood): the valid formulae are a subset of the well-formed formulae. Such a distinction is nonexistent in generative grammars consisting of rewriting rules (cf. Itkonen 2003: Chap. VI). Therefore the emergence of generativism was due to an analogy slightly different from the one mentioned by Katz: "*Syntactic Structures* [1957] opens by posing the task of distinguishing grammatical from ungrammatical sentences, on the **analogy** of well-formedness in formal systems" (Chomsky 2011: 13; emphasis added). Either way, scientific progress turns out to be (largely) driven by analogy.

Let us add a (meta-)analogous [*sic*] example. Having introduced the triples 'some/no/all', 'possible/impossible/ necessary', and 'permitted/forbidden/obligatory', von Wright (1968: 14) adds: "Although the relations within each of the three groups had been noted long ago, the **analogy** between the three groups had not, as far as I know, been noted, or at least not systematically exploited, before my 1951 paper" (original emphasis). "Deontic logic, in its modern form, originated from the observation of the analogy [just mentioned]" (p. 13; cf. Itkonen 2005b: 17 and, for more general discussion, Sect. 4.3). Thus axiomatic logic and modal logic gave rise, respectively, to generative grammars and to deontic logic, just as, furthermore, two-valued logic gave rise to many-valued logic (*ibidem*).

C) Generativism Rediscovers Analogy

Interestingly, Chomsky has recently come to see at least some of the virtues of analogy. Consider the following sentences, most of which are taken from Chomsky (2011: 21-22, with a different numbering):

(1) John ate an apple
(2) John ate
(3) Hannibal ate John
(4) John invited friends
(5) *John invited
(6) John is too angry to eat an apple
(7) John is too angry to eat
(8) John is too angry for Hannibal to eat
(9) John is too angry to invite

This is what Chomsky has to say about some of these sentences: "… (7), by **analogy** to (2), should mean 'John is so angry that he won't eat anything'. That's the natural interpretation, but there is also a different one: namely, 'John is so angry that someone or another won't eat him' – the natural interpretation [i.e. John = PAT] for the structurally **analogous** expression (9)" (p. 21; emphasis added).

The sentence (9) has only one meaning, with John = PAT, due to the incorrectness of (5). By contrast, (7) has two different meanings, due to the correctness of both (2) and (3):

(7a) John = AG
(7b) John = PAT

As we just saw, Chomsky takes this to mean that there are the following two analogies:

(2) ~ (7), i.e. (7a)
(9) ~ (7), i.e. (7b)

Even more explicitly, there are two chains of analogous sentences A and B, either with John = AG or with John = PAT:

A) (1) ~ (2) ~ (4) ~ (6) ~ (7)
B) (3) ~ (7) ~ (8) ~ (9)

The only sentence included in both chains is (7). As far as the semantics of (7) is concerned, nothing more needs to be said (apart from its grammatical description). Chomsky mentions these analogies to prove that (7), i.e. (7b), "contains an invisible object"; but this is not necessary. The semantic ambiguity of (7) is explained in the same way as that of the sentence *Where did John say that we had to get off the bus?* (cf. Sect. 4A). Unobservable elements are replaced by observable analogical relations.

My argument is reminiscent of (though not identical with) the one that was given in the 1970's e.g. by Cooper (1975: 113-115) to show that it is unnecessary to postulate two distinct ('syntactic') deep structures for *John is easy to please* and *John is eager to please*. It is enough to specify in the lexicon the following meaning difference between *easy* and *eager*: 'x is easy to INF, x = PAT' vs. 'x is easy to INF, x = AG'. I wish to emphasize, however, that the use of underlying or 'deep' entities remains a fully legitimate descriptive device as long as they are not taken to be ontologically or psychologically real. Acquaintance with Pāṇini's sophisticated technique has convinced me of the truth of this proposition (cf. Itkonen 1991: Chap. 2).

D) Meaning as Invisible Form

In the face of steadily growing opposition, Chomsky has consistently claimed that the surface is inadequate to do the job it is supposed to do. In the 1960's he spoke of "the misleading and inadequate character of surface structure" (1968: 30), and in 2010's he reiterates the same view: "the surface forms in themselves tell us little about the interpretations … The elements that constitute lexical items … cannot be detected in the physical signal" (2011: 22).

Now, if the observable physical signal is indeed inadequate, then its defects must be compensated for by unobservable physical entities: "Even the simplest words in many languages [not to speak of complex sentences] have phonological and morphological elements that are **silent**" (2011: 28; emphasis added). For instance, the Yoruba sentence *ó rà á* is sure to contain a fair amount of silent or invisible elements. They are assumed to be necessary for correct interpretation. In reality, they are justified on semantic grounds, on a par with previous deep structures.

On this crucial issue, both Cognitive Grammar and Construction Grammar endorse a position diametrically opposed to generativism: "constructs having [no] phonological content … are never valid. … Cognitive grammar … claims that grammatical structure is almost entirely overt: things really are what they appear to be, provided we know how to interpret them properly" (Langacker 1987: 26-27). "No underlying syntactic or semantic forms are posited. Instead, Construction Grammar is a monostratal theory of grammar like many other current theories, including … Cognitive Grammar …" (Goldberg 1995: 7). In just the same way, Anttila (1972: 130) already noted that analogy-based descriptions represent "surface linguistics".

In order to further elucidate the meaning-as-form fallacy, I shall make use of a metaphor. An instrument, e.g. an axe, has both a form and a function. If an axe has to be described, it is natural to start by describing its form, but this does not yet produce a complete axe-description. How should the function be described? The simple (but wrong) way is just to **add** something to the already-existing form-description, thus implicitly remaining on the same ontological level. The function-description can be achieved by means of features like [+ splitting] vs. [-splitting]. Because their referents are not observable (= physical) in the same sense as the subject-matter of form-

description, they are inferred to be unobservable: they are silent elements captured by and included in the form-description.

A similar fallacy was committed by generative semantics in the early 1970's: if meaning is gradually converted into form, meaning and form must belong to an ontologically homogeneous domain. Let us note in passing that the same criticism does not apply to Pāṇini's grammar. It does represent a movement from meaning to form, but the replacement of meanings by forms is marked differently from the replacement of abstract forms by concrete ones (cf. Itkonen 1991: 34).

E) Setting the Record Straight

Chomsky (2011: 19) expresses his dissatisfaction with "unspecified methods of analogy". This calls for several comments.

First, it may be true to say that still in the 1960's the methods of analogy were "unspecified" in the sense of not being fully formalized. Since then, however, the situation has changed completely. I repeat that analogy has been formalized by several researchers. In the present context it is enough to mention Skousen (1989), Hofstadter (1995), and Lavie (2003).

Second, Chomsky has criticized analogy for some 50 years, but he has never specified what he means by this term. There are just a few occasional remarks: "… not similar in any physically defined sense …" (1965: 58); "… no physical resemblance …" (1966: 4). These remarks show that Chomsky takes analogy to be physical or material similarity. This is an elementary mistake: analogy has always been defined as **structural** (not material) similarity. This mistake alone suffices to render 50 years of criticism null and void.

Third, the term 'computation' has been defined e.g. by Minsky (1967); and computations so defined have for a long time been used to simulate logical/linguistic behaviour (cf. Itkonen 1983: 286-313). The generativist theory is brimming with talk about 'computations', supposedly of biological or even physical nature (cf. below), but they always remain entirely **unspecified**, which means that they do **not** qualify as genuine (= Minsky-type) computations, unlike e.g. the PROLOG program of Itkonen (2005b). It has – incredibly – been possible for a generativist like Jackendoff (1987) to write an entire book about the "computational mind" without giving a single genuine computation.

Fourth, it goes without saying that there are large areas (e.g. scientific or artistic creativity) where no algorithms can be given to the functioning of analogy. This is a general truth concerning **all** attempts to formalize the whole of human behaviour and thinking. What follows? Because analogy is so obviously the driving force behind (much of) human behaviour and thinking – indeed "le vrai et nécessaire moteur du langage", as Bréal put it – we must describe it the best we can, in ways appropriate to whatever happens to be the subject matter. This is self-evident. But Chomsky disagrees. His position on analogy amounts to the claim: "either all-encompassing algorithms or nothing!" And he chooses nothing. This is inconsistent in two respects. On the one hand, he does not even try to give any algorithms to substantiate his own claims about bio-physical computations (cf. above). On the other, generativist descriptions turn out on closer inspection to be permeated – even to an excessive or harmful degree – by analogy (cf. Itkonen 2005b: 94-98).

But fifth, and in all fairness, we must have a look at what Chomsky himself means by 'computation', now that he has returned to the strong anti-mentalism of his 1955 dissertation (cf. Itkonen 1996: 497-498): "If computation is efficient then when X and Y are **merged** neither will change so that the outcome can be taken to be simply the set {X,Y}. That is … a natural principle of efficient computation, perhaps a special case of laws of nature" (Chomsky 2011: 26; emphasis added). "External Merge takes two objects, say *eat* and *apples*, and forms the new object that corresponds to *eat apples*" (p. 28). This is trivial; and as a way of reducing linguistics to physical "laws of nature", it is unconvincing, to put it mildly.

F) Returning to Where It All Started

During decades, the original motivation for the anti-analogical position has been buried under tons of misguided information and general oblivion. But in conclusion, it must be unearthed. At the bottom, there was an argument like this: "The billions of sentences that the English speaker can understand are totally **dissimilar** from one another, to the extent such a notion as 'familiar sentence' is nothing short of absurd. Because analogy is about **similarity** (and not about dissimilarity), it is useless. What is needed is some very complicated innate machinery (whose functioning no one understands)." Does this account sound nonsensical? Yes, it does. But it is nevertheless true, as I now proceed to show by means of a few pertinent quotations.

"… what we say in the course of normal language use is **entirely new**, … not even similar in pattern … to sentences or discourse we have heard in the past. … The fact surely [*sic*] is, however, that … the number of patterns underlying our normal use of language … is orders of magnitude greater than the number of seconds in a lifetime" (Chomsky 1968: 10; emphasis added).

"[It is] an almost miraculous and easily overlooked fact that any speaker of a human language …can produce and understand utterances which are **completely novel** to him … As an illustration of this novelty, you will observe that the sentences on this page are **completely novel** to you; that is, you have never seen **exactly these** sentences before. …Even in a long book it is unlikely that you can find a **repetition** of the same sentence [implying that if A is not identical with B, A is entirely different from B]" (Postal 1968: 267; emphasis added).

"Consider, for example, the sentences of 43: …b) 'It is difficult for him to understand this lecture', c) 'He read the book that interested the boy' … The sentences of 43 … are as 'unfamiliar' as the vast majority of those that we encounter in daily life …" (Chomsky 1968: 41-42).

"In fact, even to speak of 'familiar sentences' is an **absurdity**" (Chomsky 1967: 4; emphasis added).

"A human speaker has the ability to create and understand an unlimited number of **completely novel** sentences" (Langacker 1968: 22; emphasis added).

What should a rational person make of all these statements? Householder (1969: 888-889) captures perfectly the feeling of bafflement that every rational person is bound to have: "[One] might question the word 'completely', which suggests that no sentence bears any partial resemblance to any other sentence – a claim so obviously false that Langacker must mean something else, though I cannot **for the life of me** figure out what" (emphasis added). Nor did Langacker himself understand at all what it was that he saying. That he said it nevertheless, was a prima facie irrational action, yet easily explained by the notion of rational explanation (cf. Itkonen 1983). This action was a means adequate to confirm his allegiance to the creed of the day.

The rejection of analogy was later formulated as the 'poverty of the stimulus' (= POS) argument, which still provides the justification of the generative enterprise in Chomsky (2011): Because there is no analogy (or generalization) that the child could apply to the ("limited and degenerate") data that s/he encounters, s/he could not learn the language if s/he were not aided (in some unspecified way) by some powerful innate (= ultimately physical) machinery. As we have seen, the rejection of analogy is based on nothing but ignorance ('analogy = material similarity'), misunderstanding ('sentence = pattern of sentences'), and confusion ('non-identity = absolute difference'). Therefore the POS argument collapses, leaving generativism without foundation. In sum, analogy refutes generativism. As noted above, Cognitive Grammar and Construction Grammar have in turn tried to prove their 'originality' by substituting such neologisms as 'schema' and 'construction' for analogy as the basis for generalizations. This is unfortunate.

Let us summarize: In the 60's, "there are **too many** data (i.e. totally different sentence patterns) for analogy to function". Since the mid-70's, "there are **too few** data for analogy to function". Any argument will do as long as it seems to invalidate analogy.

5) Conclusion

After all that has been said here, the **rational** thing to do is to abandon such neologisms as 'schema' and 'construction', and return to 'analogy', especially because this term – unlike the neologisms – has a well-established use within the history of linguistics, within such neighbouring disciplines as cognitive psychology, anthropology, and artificial intelligence, as well as within the general philosophy of science. But will the linguistic community act rationally? After 50 years of experience in this field, I doubt it.

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