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"THE WHOLE IS GREATER THAN THE SUM OF ITS PARTS" – TRUE, FALSE, OR MEANINGLESS?

CONTENTS

1) Background

Two basic positions are customarily adopted vis-à-vis the issue indicated in the title of this article, depending on the context. Here, whole = C vs. its parts = A and B:

(I) 'whole = parts', i.e. C = (A + B), where C is **additive** or reducible to A and B.
(II) 'whole > parts', i.e. C > (A + B), where C is **non-additive** or not reducible to A and B
Therefore: (I) = **reductionist** vs. (II) = **non-reductionist** (or **holistic**).

There are several uncontroversial examples of (I) (cf. below). By contrast, the exact scope of (II) remains controversial. In other words, there is no general agreement on when reduction is or is not possible (or whether it is complete rather than partial). In (II), C is regarded as **emergent**, which sometimes means that A and B are located at a lower ontological level than C. For instance, in Popper's ontology of 'three worlds', the social-normative World-3 is emergent vis-à-vis the individual-psychological World-2 just as this is in turn emergent vis-à-vis the physical World-1.

Within Cognitive Linguistics, there is – or at least seems to be – an opposition between (I) and (II). On the one hand: "A **nonreductionist** theory [such as Radical Construction Grammar, or RCxG] differs from a reductionist theory in that it hypothesizes that the whole is greater than the sum of its parts" (Croft 2001: 48; emphasis added). "In accord with the **non-reductionist** nature of CCxG [Cognitive Construction Grammar] and RCxG, both approaches emphasize that there are often interactions between parts that lead to **emergent** properties that can only be described at the level of the whole" (Goldberg 2006: 222; emphasis added).

On the other hand: "Cognitive Grammar [CG] is explicitly reductionist" (*ibidem*), a claim supported by the following quotation: "Like water (a particular configuration of hydrogen and oxygen atoms), [grammar] is however **reducible** to something more fundamental (configurations of semantic structures, phonological structures, and symbolic links" (Langacker 2003: 89; emphasis added).

But: "In some sense, water **is** clearly reducible to hydrogen and oxygen; however, no reductionist account of water is going to explain why water is wet, nor why it is used in the way it is: to bath in, to drink, etc" (Goldberg 2006: 222).

Nor should we forget that Langacker (1987) characterizes Cognitive Grammar as "a **non-reductive** approach to linguistic structure" (p. 494; emphasis added), or again as "maximalist, **nonreductive**, and bottom-up … (as compared to the minimalist, reductive, and top-down spirit of the generative tradition)" (1991: 264; emphasis added); and he also speaks of "the nonreductive character" of the CG-type phonological analysis (p. 272). Thus, at any rate, CG is **less reductive** than generativism. In other words, it looks like (non-)reductionism is a matter of degree. – Clearly, this issue is in need of some conceptual clarification.

2) Exemplifying 'whole = parts' vs. 'whole > parts'

It is the purpose of this section to familiarize the reader with the (I) vs. (II) opposition by means of a few representative examples. Before doing so, however, a few preliminary remarks have to be made.

First, there are domains like **shape**, **density**, and **elasticity** where the notion of 'sum' is meaningless and where, therefore, neither (I) nor (II) is true (or false) (cf. Nagel 1961: 385).

Second, because (II) claims C to be **more** than (A + B), there ought to be a way to **compare** C and (A + B) so as to assign respective **numbers** *n-1* and *n-2* to C and (A + B) such that *n-1* > *n-2*. Interestingly, this requirement is never fulfilled. In the absence of any units of

measurement, the cognitive significance of (II) is comparable to statements like 'John has a greater personality than Bill'. Has (II), then, any genuine **substance**? This question becomes even more urgent when we realize that (II), as originally formulated by Max Wertheimer, is "The whole is **different** from the sum of its parts", which indeed makes more sense (cf. Goldstein 1989: 23, 194; here Subsection 2G). Hence, in the name of accuracy, we must distinguish between the 'whole > parts' thesis and the 'whole ≠ parts' thesis.

Third, the fact that, up to now, no numerical 'whole vs. parts' comparisons have been made does not mean that they cannot be made. In linguistics it is in effect possible to determine quite exactly how much a whole is greater than the sum of its parts (cf. Section 10).

Fourth, the possibility of 'whole < parts' is generally ignored but it should also be taken into account (cf. Section 12).

A) Geometry & mathematics

Let us start with (I). When is it true? In geometrical and mathematical contexts (I) is "an analytic or necessary truth" (Nagel 1961: 381, 384). For instance, a circle is identical with the sum of its two halves. More generally, (I) is true of **scalar** sums: numerosity, space (= length, area, volume), time, weight, heat, electric charge and resistance. These are **clear** examples of (I). Furthermore, (I) may be extended to **vector** sums as well: forces, velocities, accelerations. For instance, a force of 3 due north and another force of 4 due east produce a single force of 5 due north-east (op. cit., p. 386).

B) Music

Next, let us examine the 'whole vs. parts' issue from the **musical** point of view. Consider this statement: "A melody is more than the sum of its individual notes." Is it true or false? Nagel (1961) gives the following sensible answer: "the statement can be established as true or false only if it possible to compare such a sum with the whole that is the melody" (p. 388). In general, the proponents of the 'whole > parts' thesis do **not** specify what they mean by 'sum' in this type of context. Nagel sees two possibilities: either they want to say that the 'whole > parts' thesis is here meaningless (but have just chosen a wrong way to say it); or they use the word 'sum' to refer to the **unordered set** of the individual notes/tones.

On the latter interpretation, we have to do with the familiar opposition between unordered and ordered sets (e.g. triples):

(1) {x,y,z} vs. (2) <x,y,z>

Three things need to be noted about the (1) vs. (2) opposition. First, there is no way to 'reduce' (2) to (1), which entails that (2) is, technically speaking, 'emergent' vis-à-vis (1).

Second, although (2) is felt to be **more** (i.e. more **structured**) than (1), there is no **numerical** sense in which this difference can be expressed.

Third, considered as a whole, (2) consists in **nothing but** *x* standing is a certain relation to *y* ('first this, then that'). It is **not** the case that (2) has some 'emergent' property in addition to this relation. It is this relation **alone** which renders (2) 'emergent' vis-à-vis (1).

The general (1) vs. (2) opposition is exemplified by our musical example as follows:

(3) {notes/tones} vs. (4) <notes/tones> = melody

Nagel's (1961) comments on the (3) vs. (4) distinction deserve to be quoted: "if the word 'sum' is used in this sense in contexts where the word 'whole' refers to a **pattern** or

configuration formed by elements standing to each other in certain relations, it is perfectly true though **trivial** to say that the whole is more than the sum of its parts" (p. 388; emphasis added). "A melody [ought to] be viewed as a relational complex whose component tones are identified independently of their occurrence in that complex" (p. 399). Thus, each side of the {list} vs. <structure> opposition has its own justification.

The foregoing can be summarized by saying that there is an **analogy** between (1) vs. (2) and (3) vs. (4), formalized as (1):(2) = (3):(4). Notice, however, that the <X> notation, which is borrowed from the set theory, serves here as a metaphor for **structure** ('pattern', 'configuration') in general, while {X} stands for the heap of the disconnected parts that <X> contains.

C) Language, preliminarily

Next, the analogy must be extended to linguistic data. Consider the following examples:

(5) {men,drink,beer} = list vs. (6) <men,drink,beer> = (sentence-)structure

(6) is the (correct) English sentence *Men drink beer*, while (5) is the (unordered) list of the words that constitute (6). Clearly, there is no way to reduce (6) to (5), which means that (6) is emergent vis-à-vis (5). It goes without saying that {X} and <X> are **different**. But is <X> **more** than {X}? Yes, but – as noted by Nagel – only in the **trivial** sense in which (2) and (4) are 'more' than (1) and (3), respectively.

A more realistic view of linguistic structure will be first given in Section 4 and then amplified in the subsequent sections.

D) Institution

Let us mention one more analogy evoked by the (1) vs. (2) opposition. As documented by O'Neill (1973), there has been in the philosophy of social sciences a long-standing debate between proponents of individualism vs. collectivism (or holism): Can **social** entities like institutions (= 'wholes') be **reduced** to actions and thoughts of **individual** persons (= 'parts')? Or do we have to postulate, in addition, the existence of some 'over-individual' entities? The obvious answer seems to be that both sides are right. On the one hand, there is nothing over and above individual persons (plus some institution-related equipment). On the other, these are persons standing in a definite network of relations to one another: what we have is a structured whole, not a random aggregate of individuals (cf. Itkonen 1978: 127-131, 2008: 290-291). Thus:

(7) {individuals} vs. (8) <individuals> = institution

The notion of **typical person** (= social role) shows how actual individuals are **integrated** into the relevant institution. Consider the following analogy: analyzing a drama as a whole is the same thing as analyzing it as a web of the roles played by the ('real') actors, in brief: <roles> = drama (cf. Ryan 1970: 177-179).

Durkheim (1973/1901) seems to repeat the (7) vs. (8) opposition: "la société n'est pas une simple somme d'individus, mais le système formé par leur association représente une réalité qui a ses caractères propres. … Il faut encore que ces consciences [particulières] soient associées, combinées, et combinées d'une certaine manière: c'est de cette combinaison qui résulte la vie sociale et, par suite, c'est cette combinaison qui l'**explique**" (p. 102-103; emphasis added). But there is a twist. Durkheim is a fervent proponent of the 'whole > parts' position:

"C'est qu'un tout n'est pas identique à la somme de ses parties, il est quelque chose d'autre et dont les propriétés diffèrent de celles que présentent les parties dont il est composé" (p. 102). In the social vs. individual dichotomy, "he was single-mindedly, almost fanatically preoccupied with demonstrating the reality of the former" (Lukes 1975/1973: 34). It follows that he places institutions (like language or currency) on an ontological level of their own: they are external to the individual who is totally unable to resist their "power of coercion". This is why he thinks that the direction of explanation must go from social to individual/psychological, never the other way around. It is easy to show, however, that in some crucial respects this intransigent position is flatly contradicted by his own descriptive practice (cf. op. cit., pp. 16-22; also Itkonen 1983: 91, 96-97).

E) Water

Next, let us consider the prototypical example of **emergence**: Is water (nothing but) H2O? The standard scientific answer is of course affirmative: water is reduced to hydrogen and oxygen, which means that it exemplifies (I). But there is also a dissenting view. For instance, to support his strict 'social vs. individual' dichotomy, Durkheim looked for analogies in other domains: "the hardness of bronze is not found in copper and tin, nor the properties of water in hydrogen and oxygen" (Lukes 1975/1973: 20). Indeed, it is universally agreed that water has properties (like viscosity and translucency) that cannot be predicted from the properties of hydrogen alone or oxygen alone or of compounds where one or the other occurs (cf. Nagel 1961: 368-369). This clearly suggests that water is an emergent phenomenon and thus exemplifies (II). We saw in Section 1) that these opposite views are represented in contemporary (cognitive) linguistics.

In my opinion, it is undeniable that here the whole is indeed **different** from the sum of its parts. By contrast, it is not at all clear why the whole should also be **more** than the sum of its parts. The combination C (= water) **gains** properties that neither A (= hydrogen) nor B (= oxygen) has alone. But it is practically never mentioned that, by the same token, C **loses** some properties of A and/or B (like hydrogen being in a gaseous state under certain conditions of pressure and temperature). The use of 'more' (or 'less') seems to be a metaphor without any clear justification (like John having a 'greater' personality than Bill).

Is water a good analogy for language? Or, to put it in simplistic terms, are hydrogen & oxygen to water what noun & verb are to sentence? I do not think so. At least, I prefer the analogy between (3) vs. (4) and (5) vs. (6). Compared to a sentence or melody, water seems to be **more emergent**. Notice that in this particular instance the use of 'more' is not just metaphorical but can be justified be referring to **tangible** changes that occur in moving from parts to wholes: there is little tangible difference between verb and sentence.

If a linguistic analogue has to be found for water, then – as de Saussure (1916/1962) pertinently notes – one should perhaps think of the **linguistic sign**. It is a unity whose constituents, i.e. form (*signifiant*) and meaning (*signifié*), are comparable to hydrogen and oxygen insofar as "pris à part, chacun de ces éléments n'a aucune des propriétés de l'eau" (p. 145). By contrast, there are many properties that nouns and, in particular, verbs share with sentences.

Several definitions have been proposed for 'emergence', some of which are quite technical (cf. Beckerman et al. 1992). In the present context it is enough to rule out the most obvious definition which equates 'emergent property' with 'property that can only be defined at the level of the whole'. We have agreed that a circle is the sum of its two halves, but clearly 'circle' has properties (like 'completely round') which 'half circle' has not. Or consider such a whole as the string of letters SKDL. It can be partitioned in many different ways, but none of its

possible parts has the property ‘contains four letters’. Does this mean that SKDL is emergent? No, unless every whole is ‘emergent’ by definition.

F) Perceptual gestalt

Traditionally, this is where the strongest support for (II) comes from: “The paradigm example of a nonreductionist theory is the theory of perception proposed by the Gestalt psychology” (Croft 2001: 47). This surely sounds plausible.

The basic insight has been described as follows: “This sequence of flash-darkness-flash causes a phenomenon called **apparent movement** – the perception of movement from left to right through the dark space separating the two flashed lights. How, asked Wertheimer, is it possible to explain our perception of a line moving through the dark empty space in terms of sensations? Since there is **no stimulation** whatsoever in that space, there are no sensations present to provide an explanation … and the phrase ‘The whole is different from the sum of its parts’ became the battle cry of the Gestalt psychologists” (Goldstein 1989: 22-23; the second emphasis added). Demonstrations like this justified “the idea that the stimulus must be considered as a whole” (p. 194)

In apparent movement, something is perceived which is not there. The same phenomenon recurs in the so-called ‘phonemic restoration effect’: a sound which is masked by white noise (= •) is nevertheless perceived, for instance the vowel /o/ upon hearing the word-like stimulus *[pr•gress]* (op. cit., pp. 465-466). It seems natural to say that here the whole is more than the sum of its parts. Yet there is reason to question the justification of this well-entrenched expression.

Let us simplify the auditory example: two sounds A and B are given, but three sounds are heard, namely a word C, where C = (A + D + B). Clearly, the whole (= C) is greater than the sum of its parts (= A + B), is it not? No, it is not. There is a mistake in this argument. The parts A and B are **physical** elements, but these are **not** the parts that the whole C contains. Rather, C contains the **psychological** elements A’, D’, and B’. One may be tempted to say that (A’ + D’ + B’) > (B + C), but this would be a mistake, like comparing apples and oranges. Hence, if ‘the parts’ stand for the stimuli, the whole is **not** greater than the sum of its parts. (Nor is it smaller.) At the perceptual level, on the other hand, the whole **is** equal to the sum of its parts: C = (A’ + D’ + B’).

To put it differently, **two** wholes are involved here, physical and psychological, and the Gestaltist argument amounts to the confused claim that the psychological whole is greater than the sum of the parts of the physical whole (cf. Phillips 1976: 117-118).

In general, the ‘whole > parts’ thesis is neutral as to the synchronic vs. diachronic distinction. The most obvious justification for postulating emergent properties comes from the domain of **evolution**: the transition from single living cells to animals must contain an enormous amount of changes big enough to qualify as emergent. For simplicity, the evolutionary point of view will be ignored here. But adopting the **process** point of view may supply additional clarification. Accordingly, the argument of the preceding paragraph may be summarized as follows:

(9) (A + B) à M à (10) C = (A’ + D’ + B’)

The human perceptual mechanism M receives A and B as an **input** and produces C, i.e. (A’ + D’ + B’), as the **output**. It goes without saying that any M must change its input in some way. Why? Because it makes no sense to construct or postulate a ‘mechanism’ which leaves the input **entirely** untouched (i.e. with ‘input = output’). In the present case M turns physical data into perceptual data and “creates something out of nothing”, namely D’. The same

argument applies to the emergence of apparent movement: input = two stationary flashes of light vs. output = perceived motion.

In sum, and against all expectations, (II) receives no genuine support from Gestalt Psychology.

3) The Definition of 'Sum'

Let us recall that the contrast between (I) and (II) is meaningful only to the extent that it is possible to specify what is meant by 'sum'. Having discussed scalar and vector sums, Nagel (1961) proposes the following maximally general definition of 'sum': "the 'sum' of a given set of elements is simply an element that is **uniquely determined** by some **function** (in the mathematical sense) of the given set" (p. 387). To be sure, this definition has the drawback of eliminating the ('superficial'?) difference between (11) and (12), given that both addition and subtraction (as well as multiplication and division) are mathematical functions:

(11) +(6,2) = 8 vs. (12) –(6,2) = 4

Now, 'transitive verb', for instance, may be is defined as a two-place function which takes a pair of nouns as its arguments and yields 'sentence' as its value, as in (13):

(13) V-tr(N-1,N-2) = S

On this interpretation, then, *S* is the 'sum' of *N-1* and *N-2*. But notice that if many-place functions are redefined as successions of one-place functions, as in (Montague-type) categorical grammar (cf. Itkonen 1983: 144-145), this notion of 'sum' seems to become meaningless, because we are no longer dealing with a "set of elements" (= arguments). Yet this consequence can perhaps be avoided by arguing that we really have to do here with many-place functions, given that there are other one-place functions (like 'to the power *n*') as well which are implicit many-place functions (here: multiplications).

Unfortunately, the mathematical definition is not suitable to cover those cases that are the most interesting from the linguistic point of view. Therefore, in what follows, the term 'sum' will designate the number of the (disconnected) units in a {list}, with the understanding that these are identical with the relevant parts of a corresponding <structure> (cf. Sect. 4).

4) The Relativity of 'Whole vs. Parts'

The simple 'list vs. structure' dichotomy may be replaced by the trichotomy 'no structure (= list) vs. flat structure vs. hierarchical structure'. The 'no structure' option is explained by Ryan (1970: 181) as follows: "That the whole is not **merely** the sum of its parts is clear as soon as one reflects on the difference between a motor which is assembled and ready to run and a motor which is stacked in components on a shelf." This repeats the distinction between {x,y} and <x, y>.

Let us stipulate that {x,y} has **disconnected** parts whereas <x,y> has **integrated** parts. The sum of the disconnected parts is 2, and we already agreed in Subsection 2B that this type of sum is always less than the whole (in some intuitive sense of 'less'). But now we must ask: What is the sum of the integrated parts? Interestingly, this may not be a meaningful question. The answer cannot be 2 because, as we just saw, this is the sum of the disconnected (= **un**-integrated) parts. But any other answer – like 3 or 4 – seems equally unjustified. Furthermore: if (as we have agreed) the sum of the disconnected parts, i.e. 2, is **less** than the whole, what is then the number that correctly characterizes the whole? Again, any specific answer – like 3 or 4 – seems meaningless. Finally: assuming that the 'sum of the integrated parts' is a coherent notion, does it in any way differ from

the whole, i.e. <x,y>? A negative answer is suggested e.g. by the 'institution = drama' analogy of Subsection 2D. This discussion will be continued in Section 5.

In order to illustrate the distinction between flat and hierarchical structures, Simon (1962) uses a parable that has subsequently been made famous by Koestler (1967: Chap. III) and Sampson (1980: Chap. VII). A and B are persons who make watches with an equal number of parts (e.g. 1000), but A proceeds by combining elementary parts with one another whereas B proceeds by stages: first, a set of 10 elementary parts is assembled into a second-level unit; next, this is repeated 100 times; next, a set of 10 second-level units is assembled into a third-level unit; next, this is repeated 10 times; finally, the set of 10 third-level units is assembled into one fourth-level unit which is identical with a complete watch (with 1000 elementary parts). The two types of watches are described, respectively, by a (linear) **string** and by a (hierarchical) **tree**.

Simon's parable is based on the assumption that string-like structures are unstable whereas tree-like or hierarchical structures are stable: if the process of assembly is interrupted e.g. when A is handling the 947th part, A must go back to the beginning and start anew, whereas it is enough for B to go back to the intermediate unit s/he was working with. Assuming that disturbances intervene now and then, completed flat structures are bound to occur with a very much lower probability than completed hierarchical structures. This is where biological evolution produces results analogous to those produced by rational planning. Sampson (1980: 172) seems justified to claim that if sentences had no hierarchical structure, language-acquisition would be impossible.

Let us consider a simple example like (6), i.e. *Men drink beer*. Presented as a tree, it exhibits three levels of **form**, i.e. clause > word > sound. (For simplicity, the NP and VP levels are ignored here.) Clauses consist of words, which consist of sounds, which consist of (articulatory) features:

clause		<men,drink,beer>	
word	<m,e,n>	<d,r,i,n,k>	<b,e,e,r>
sound	<m> <e> <n>	<d> <r> <i> <n> <k>	<b> <e> <e> <r>

Each level has its own **function**. The clause expresses a speech act which, being an assertion, is characterized by a truth-value. Words signify the 'furniture' of the language-external reality. Sounds have according to Trubetzkoy (1958/1939: 29) three principal functions, namely *distinktiv (= bedeutungsunterscheidend)*, *kulminativ*, and *delimitativ*. "Structure is based upon, or determined by, function. This also explains, incidentally, why it is in practice nearly impossible to keep 'structuralism' and 'functionalism' apart" (Itkonen 2005a: 2). As applied to sounds, of course, the <X> notation implies no intrinsic order.

From the purely formal/physical point of view, it is perhaps conceivable to 'reduce' the higher levels to the lower ones, or to think that a spoken utterance is 'nothing but' a string of sounds (but not features!). From the functional point of view, however, this makes no sense at all. It is impossible to 'reduce' the truth-value creating capacity of a clause to phonological oppositions such as /m/ vs. /p/ that creates the meaning difference between 'men' and 'pen'.

Koestler (1967: 54) makes a sensible distinction between 'dissecting' (= analyzing) a whole and 'reducing' it. The former is a necessity while the latter is controversial. Erdman & Stover (1991: 12) make an analogous distinction between 'methodological' and 'epistemological' reductionism. Over-zealous supporters of 'whole > parts' seem willing to deny the possibility of any kind of analysis. But: "We can't regard a sentence as a holistic, unanalysable unit, as the Gestaltists might maintain one should", as the psychologist James Jenkins once put it (quoted from Koestler 1967: 49).

The Janus-like nature of units located at intermediate hierarchical levels is emphasized by Koestler (1967: Chap. III): seen 'from below', a word is a whole while seen 'from above', it is a part. This emphasis becomes more comprehensible when we consider the original hierarchy given by Simon (1962): book > chapter > section > paragraph > (complex) sentence > clause > word > syllable > letter. Certainly the organizing principles of a book are not those of a syllable. Notice also that each book has its own context, which constitutes the next higher level in the hierarchy; and "the hierarchy of environments can be extended indefinitely" (Koestler 1967: 102).

One of the most comprehensive hierarchies has been described in the *Vākyapadīya* ('Book on Sentences and Words') by Bhartṛhari (c. 500 AD). At the top there is Brahman (= 'the One', 'Ground of the Universe') while at the bottom there are details of allophonic variation in Sanskrit. The top and the bottom are connected as follows. The One is divided into space and time; these are subdivided into states of affairs; these are in turn analyzed into actions and participants ('things'); participants exemplify semantic roles defined by each respective action; semantic roles and actions are meanings expressed by nouns and verbs; finally, meanings are gradually replaced by forms in accordance with the general structure of Pāṇini's grammar (cf. Itkonen 1991:79-83).

When undertaking a phonological description, for instance, it is impossible to always take the entire universe into account. So it becomes vitally important to establish a descending series of less and less comprehensive sub-wholes (preliminarily illustrated by the 'book > … letter' hierarchy). But how are we to draw the line between genuine and spurious wholes? This question will be addressed in Section 6.

Up to now, it has been taken for granted that 'whole' must be understood in the **syntagmatic** sense, in the direction from big to small. There are also **paradigmatic** wholes, exemplified by phonological systems and declensions/conjugations (cf. Sections 5, 8). Still, the syntagmatic sense can be taken as the primary one.

5) 'Whole vs. parts' and analogy

Analogy is defined as structural similarity. Two or more **wholes** A, B, etc. are analogous if (and only if) they share some common structure X; and this is the case if (and only if) A has the same number of **parts** as B, i.e. parts which stand in the same (or similar) relation to each other as do the parts of B. (The common structure X can just as well be called 'schema' or 'construction'.) It is not only the case that the 'whole vs. parts' opposition is constitutive of the very idea of analogy (cf. Itkonen 2005a: 1-3). It is also the case that analogy presupposes the truth of 'whole = parts', namely in the 'methodological' sense in which it must be possible to analyze a whole into its integrated parts (cf. Sect. 4).

Analogies exist in all knowledge domains. Linguistic analogies are based either on form alone or on meaning alone or on both at the same time. For instance, all three-vowel systems with */a/, /i/, /u/* are (formally) analogous irrespective of details of phonetic realization (cf. Sect. 6). Semantic analogies are exemplified in German by such lexical **proportions** as *Vater : Mutter = Sohn : Tochter* (cf. Paul 1880/1975: 107). Well-known examples of form-meaning analogies are provided by inflectional paradigms, e.g. *Tag-**ø** : Tag-**es** : Tag-**e** = Arm-ø : Arm-**es** : Arm-**e***, which exemplify NOM.SG – GEN.SG – DAT.SG in German (pp. 107-108). In just the same way, entire sentences share a common form-meaning structure (*Muster*). For instance, the interrogative structure *V N?*, with a preposed predicate, is exemplified by such sentences as *spricht Karl?* and *schreibt Fritz?* This is easier to understand once these sentences are reformulated as *spricht : Karl = schreibt : Fritz* (p. 109). The form-meaning situation is captured by Sapir's (1921) statement that "analogous concepts and relations are most conveniently symbolized in analogous forms" (p. 38). He calls this "a universal trait of language".

To sum up: “Mit der äusseren **Form** der syntaktischen Zusammenfügung assoziiert sich das Gefühl für eine bestimmte **Funktion**, und diese Funktion bildet dann in Gemeinschaft mit der äusseren Form das Band, welches die Proportionen zusammenhält. **Alle** syntaktischen Funktionen lassen sich **nur** aus solchen Proportionen abstrahieren“ (p. 109; emphasis added). The “combinatory activity” which generates new sentences is the source of linguistic **creativity**: “Diesen Vorgang nennen wir Analogiebildung” (p. 110).

Paul represents the standard view. It has been reformulated e.g. by Jespersen (1924/1965) as follows: “What is essential is that in pronouncing it [= a new sentence] he [= the speaker] conforms to a certain **pattern**. No matter what words he inserts, he builds the sentence up in the same way, and even without any special grammatical training we feel that the two sentences *John gave Mary the apple* and *My uncle lent the joiner five shillings* are **analogous**, that is they are made after the same pattern. In both we have the same type” (p. 19; emphasis added).

The analogy-creating (ditransitive) pattern adduced by Jespersen has been meticulously investigated by Goldberg (1995) as “ditransitive construction”. In particular, a clear distinction is made, e.g. on p. 50, between semantics and syntax (i.e. ‘cause-receive <AG REC PAT>’ vs. ‘V SUBJ OBJ OBJ2’). It is in this same spirit that Goldberg (1995, 2006) and Croft (2001) also redefine what has traditionally been called intransitive vs. (mono)transitive sentence structures or patterns.

We saw in Section 1 that Construction Grammar favours the ‘whole > parts’ view. Interestingly, this attitude is entirely absent from analogy-based research, documented in Itkonen (2005a). Apparently it has been taken for granted that the list of the disconnected parts {x,y,z} is not just different from but also less than the functioning whole <x,y,z>; but, as noted by Nagel, this is a trivial truth. On the other hand, if the parts are considered not as a list, but as integrated into a functioning whole, then the justification of the ‘whole > parts’ view disappears. Let us illustrate.

In Yoruba, verbs and nouns are typically (though not exclusively) characterized by distinct syllabic structures, for instance: *pa* (‘to kill’), *rà* (‘to sell’), *le* (‘to be hard’) vs. *apá* (‘arm’), *ẹni* (‘person’), *ògiri* (‘wall’). Thus, considered as grammatical **meanings**, ‘verb’ and ‘noun’ are expressed by the corresponding gestalts:

(14) verb = CV vs. (15) noun = VCV(VC)

The difference between (14) and (15) is exhaustively described by means of the following three features: (i) quality = consonant vs. vowel; (ii) order = before vs. after; (iii) number = 2 vs. 3 (or 5). In particular, (14) and (15) have no ‘emergent property’ (or no ‘holistic residue’) over and above what can be said by means of (i)-(iii). What is true of (14) & (15) can be generalized to all constructions and wholes.

So which is the true alternative, ‘whole = parts’ or ‘whole > parts’? As already suggested by what precedes, the answer depends on whether we are speaking of disconnected or integrated parts. The popularity of the ‘whole > parts’ view seems to be based on the inability to distinguish between these two notions.

Some of the Gestaltist rhetoric seems to suggest that ‘irreducible’ wholes should be treated as such, in the sense of not being analyzable at all. The Jenkins quotation in Section 4 reveals as much. It is good to realize that what is unanalyzable is also indescribable and thus ineffable: “Wovon man nicht sprechen kann, darüber muss man schweigen.”

6) Problems of interpretation

On the one hand, the parts of a genuine whole have many relations and properties, some of which are relevant while others are not (cf. Phillips 1976: 9-10): a battalion is defined by the chain of command, not by whether some of its members like music more than others. On the other hand, the existential status of wholes ranges from genuine to spurious.

A) "The whole determines the identity of any of its parts"

The thesis given as the title of this subsection is often lumped together with the 'whole > parts' thesis, but in reality they are two different things. The truth of this new thesis is often self-evident, as when the linguistic context determines the meaning (= identity) of an ambiguous unit:

(16) John'**s** friend smoke-**s** cigar-**s**

The English suffix *-s* has three distinct meanings (i.e. GEN, PL, 3SG), each of which occurs in (16); and in each case the identity of *-s* is determined by the larger (syntagmatic) context (= word, phrase, or sentence). This example is uncontroversial. It may be harder to decide to what extent the identity of a non-ambiguous (lexical) unit depends on the changes in its syntagmatic context. Let us consider a sentence made famous by Goldberg (1995):

(17) Sam sneezed the napkin off the table

Here an intransitive verb is used in a caused-motion construction, on the analogy of transitive verbs like *to push*. On the one hand, this new context (= 'whole') changes the identity of *to sneeze* (= 'part') in a predictable way, namely from intransitive to transitive; on the other, it still remains the same verb (apart from the intransitive/transitive variation).

The so-called "où tout se tient" principle is the lasting legacy of structuralism. It says that (linguistic) units must not be considered in themselves, or atomistically, but in relation to each other or as parts of a larger (paradigmatic) whole, which in consequence determines their identity: "c'est du tout solidaire qu'il faut partir pour obtenir par analyse les éléments qu'il renferme" (de Saussure 1962/1916: 157). This principle is abundantly illustrated by Trubetzkoy (1939/1958). Three examples from his general taxonomy of vowel systems (pp. 98-99) will be singled out here: "two-level triangle system" (*zweistufiges Dreiecksystem*, here A), "three-level triangle system" (*dreistufiges Dreiecksystem*, here B), and "three-level square system" (*dreistufiges Viereckssystem*, here C):

A

i u

a

B

i u

e o

a

C

i	u
e	o
ä	a

The ”où tout se tient” principle teaches two lessons concerning A-C. First, the roles of (e.g.) /a/ are **different** in A, B, and C. Second, the role of (e.g.) /a/ is **the same** in all languages that exemplify (e.g.) the system A and thus qualify as analogous in this respect.

The primary use of the structuralist “où tout se tient” principle belongs to the paradigmatic context, but it can easily be extended to syntagmatic contexts such as (16) and (17). It must be carefully distinguished from the ‘whole > parts’ thesis. The latter admits of many different interpretations, either good or bad.

B) ‘Parts do not exist outside of wholes’

The structuralist principle, though valid, can be assigned an extravagant interpretation: “The parts … do not have an independent existence outside of the whole construction …” (Croft 2001: 48). Taken literally, this is just false. All the words (= lexical units) that occur in the constructions (16) and (17) have an “independent existence” in English dictionaries, hence “outside of” (16) and (17). Even the suffix *-s* has an “independent existence” in any grammar of English, hence “outside of” (16). Therefore, something else must be meant. But what is it? As far as I can see, one of two things is being asserted here, each in a misleading way. First, if *x* is a member of a list *{x,y,z}*, it certainly exists, but in a way that is **totally different** from how it exists as part of the structure *<x,y,z>*, which just repeats the opposition between (1) and (2). Second, the way that *x* exists as part of a given structure *<x,y,z>* is never **exactly the same** as when it exists as part of any other structure *<x,y>*, *<y,x,z>*, *<x,y,z,w>*, etc.

What is being claimed here reduces to a tautology: the way that *x* exists in *<x,y,z>* cannot be (exactly) repeated outside of *<x,y,z>*. But remember that it is often debatable whether we have *{x,y,z}* or *<x,y,z>*. In principle, the way that one coin exists as part of group of three coins is not **exactly** the same as the way it exists as parts of a group of four coins or, for that matter, of three coins and one pencil, etc. But this just repeats the fallacy that all conceivable properties/relations are (equally) relevant ones (again, cf. Phillips 1976: 9-10).

Still, this issue contains a rational kernel. In India some 1500 years ago there was a lengthy debate concerning the primacy of word vs. sentence. Both sides of the debate accepted the dictum *padaprakṛtiḥ saṃhitā* (where *pada* = word, *prakṛtiḥ* = origin, *saṃhitā* = sentence), but one side understood it as a determinative compound (‘sentence is the origin of words’), whereas the other side understood it as a possessive-exocentric compound (‘sentence is that which has words as its origin’) (cf. Itkonen 1991: 82; Houben 1997: 116-118). Obviously, each side has its own justification. While a melody consists of nothing but tones, these can be identified independently of their occurrence in it, as noted by Nagel (1961: 399).

Moreover, it is certainly true that the parts of a **discontinuous** whole cannot be identified independently from each other. Let us consider the Swedish expression for ‘definite & singular’ exemplified by ***det*** *stor-**a*** *hus-**et*** (‘the big house’). Both *det* and *-a* also occur outside of this construction, but in other functions, i.e. *det* as a demonstrative pronoun (‘it’ ~ ‘that’), e.g. in *Det var bra!* (‘That was good!’), and *-a* as an exponent of ‘plural’ in adjectives, e.g. *Här finns ing-**a*** *stor-**a*** *hus-ø* (‘There are no big houses here’, where also *-ø* = PL). Hence the identity of *det __a __et* is indeed determined by the whole which they are part of. (To be sure, *hus-et* [‘the house’] occurs in the same function also outside of this construction.) But it is not true that all wholes can be regarded as discontinuous in this (strong) sense.

C) ‘Atomic ≠ primitive’?

For Construction Grammar, constructions are wholes, and their theoretical novelty vis-à-vis such traditional notions as ‘pattern’ or ‘structure’ presumably consists in that they cannot be reduced to their atomic parts: “Constructions, not categories and relations, are the basic, **primitive** units of syntactic representation. The categories and relations internal to constructions are derived from them …” (Croft 2001: 48; emphasis added). By contrast, “**atomic** units are those that cannot be broken into smaller parts in the theory” (p. 47; original emphasis). Notice that “the internal structure of words are also constructions” (p. 17).

In order to test the validity of the atomic vs. primitive distinction, we can make use of our Yoruba example, i.e. (14) & (15). We have seen that the constructional difference between verbs and nouns is fully accounted for in terms of three features (= “categories and relations”), namely: (i) quality (= consonant vs. vowel), (ii) order (= before vs. after), (iii) number (= 2 vs. 3 or 5). Should (i)-(iii) be called ‘atomic’ or ‘primitive’? This is a meaningless question. The important thing is that after (i)-(iii) have been applied, there remains nothing to describe, certainly no ‘emergent’ property uniquely possessed by the ‘construction itself’. In particular, it is certainly **not** the case that such general categories and relations as quality, order, and number could somehow be “derived” from the (allegedly “more primitive”) (14) and (15).

By the same token, these categories and relations certainly have “an independent existence outside of” the constructions they describe, for instance, outside of verbs like *pa* and nouns like *apá*. If regarded as (maximally general) ‘parts’, they constitute the refutation *par excellence* of what is claimed in the titles of 6-A&B.

7) ‘Whole vs. parts’ and compositionality

> “The meaning which subsists in each word is, in a sense, the minimal unit of the sentence , … so, in turn, the structural combining of meanings will produce sentences by combining words” (Apollonius Dyscolus / Householder 1981: 19). This general principle, known today as **compositionality**, is a necessary ingredient of every linguistic theory: “Some degree of compositionality must obviously be assumed. … we will concentrate on **semantic** compositionality” (Langacker 1987: 449, 448; emphasis added). “Linguists agree, and so does the average lay person, that the reason *The cat stole the hat* **means** something different from *The cat ate the hat* is that *stole* and *ate* make different contributions to the interpretation of the whole, … (Sweetser 1999: 133; emphasis added). “We parcel out the responsibility for **meaning** among the various elements of the sentence” (Goldberg 2006: 224; emphasis added).
>
> The example (13) is an example of **formal** compositionality. It illustrates ‘whole = parts’ because *S* is the sum of *N-1* and *N-2*, as defined by Nagel (1961). The linguists quoted in the previous paragraph, by contrast, are speaking about **semantic** compositionality. Otherwise, the basic idea seems to be the same: “In fully compositional expressions, the composite structure [C] is computable in this sense, hence [C] = [AB] …: [C] is a **regular compositional function** of [A] and [B]” (Langacker 1987: 450; original emphasis).
>
> Such expressions certainly illustrate ‘whole = parts’, but not exactly in the sense of (13). Why not? Because, assuming that we are dealing with mathematical functions, [C] is the value of a function applied to the arguments [A] and [B], not the function itself. (If it is the function, what is the value?)
>
> It is generally agreed today that, on closer analysis, semantic **non**-compositionality – and correspondingly, the **lack** of “fully compositional expressions” – is quite wide-spread, and certainly more so than was thought to be the case some 40 years ago. The examples typically adduced in support of this position are provided by combinations of **lexical** meanings, i.e. by

such expressions as *black bird*, *fake gun*, and *roasted meat*, examined in Langacker (1987), Sweetser (1999), and Croft (2001), respectively. Yet the (non-)compositional nature of **grammatical** meanings has also been noticed, as shown by such examples as *comput-**er*** and *deriv-**ation**-**al***, examined by Langacker (1987) and Goldberg (2006), respectively.

For the present purpose, the most interesting type of example is one "in which a composite structure has substantial semantic content not attributable to either component" (Langacker 1987: 452; also p. 292). For instance, in Eastern Mono, combining an intransitive verb with a prima facie instrumental prefix produces a **causative** meaning. Examples like this open the way to considering, more generally, how grammatical meanings are expressed. In his analysis of the Eastern Mono example Langacker still takes it for granted that grammatical meanings must have some formal exponents (or "components"), e.g. prefixes. But taking into account those near-ubiquitous cases where grammatical meanings have **zero** expression, or are **not** expressed at all, opens up an entirely new perspective on the 'whole vs. parts' discussion (cf. Section 10 below).

At this point, we have reached the conclusion that compositionality equals 'whole = parts' whereas non-compositionality equals 'whole ≠ parts. In order to move ahead, some additional apparatus is needed.

8) The principle of 'one meaning – one form'

"Jede Sprache ist unaufhörlich damit beschäftigt … für das funktionell Gleiche auch den gleichen Ausdruck zu schaffen. … Trotz allen Umgestaltungen, die auf dieses Ziel losarbeiten, bleibt es ewig unerreichbar" (Paul 1880/1975: 227). "In an ideal language, … the same modification of sounds would always have the same meaning, and the same signification or function would always be expressed in the same formal way. … [But w]e must never lose sight of the fact that one form may have two or more significations, or no signification at all, and that one and the same signification or function may be denoted now by this and now by that formal means, and sometimes by **no** form at all" (Jespersen 1924/1965: 41; emphasis added).

What Paul and Jespersen are grappling with here has been called the principle of 'one meaning – one form' by Anttila (1972/1989: 101), or the 1M1F principle, for short. More precisely, it denotes a one-to-one correspondence between meanings and forms: 1M1F, 2M2F, 3M3F, etc. Plank (1999) has coined the following terms for the different 1M1F options, both syntagmatically and paradigmatically:

S(yntagmatic)	1M?F = separative (one meaning, any number of forms)
	?M1F = local (any number of meanings, one form)
P(aradigmatic)	1M?F = distinct (one meaning, any number of forms)
	?M1F = invariant (any number of meanings, one form)

The **ideal** types: S-1M1F = separative & local (syntagmatically) vs. P-1M1F = distinct & invariant (paradigmatically).

The **deviations** from 1M1F, i.e. non-1M1F, both in the syntagmatic (= S) and in the paradigmatic (= P) dimension, are summarized as follows:

S	2M1F = cumulative (& local)
	1M2F = (separative &) discontinuous
P	2M1F = ambiguous (& invariant)
	1M2F = (distinct &) variant

Notice the following generalization: *1M2F* means here 'one meaning – **at least** two forms' while *2M1F* means '**at least** two meanings – one form'. These are the **basic** (or default) types of non-1M1F. In practice, not only local but also discontinuous units can be cumulative, just as not only invariant but also variant units can be ambiguous. Instead of 'discontinuous' and 'ambiguous', Plank (1999) uses the terms 'extended' and 'homonymous', respectively. Notice the following equivalences: 'cumulative' = 'portmanteau' and 'variant' = 'allomorphic'/ 'synonymous' / 'flexive'.

The 1M1F principle is of considerable interest, but we shall make only a limited use of it in what follows. First, we shall concentrate on **syntagmatic** wholes and their 'pre-syntagmatic' (rather than paradigmatic) parts (cf. Sect. 10). Second, the (syntagmatic) distinctions 'separative vs. cumulative' and 'local vs. discontinuous' prove to be unimportant because they are not needed to differentiate between wholes and parts.

9) Compositionality and 'one meaning – one form'

As noted above, compositionality is about 'predicting' the whole from its parts. In the absence of mathematical functions, this idea is bound to remain vague. The use of the 1M1F principle may bring some clarification. Let us consider how the 'horizontal vs. vertical surface' distinction is expressed in (18) and (19):

(18) The picture is on the table
(19) The picture is on the wall

In this particular instance the answer is exceptionally easy because (18) and (19) are identical apart from the *table* vs. *wall* contrast. Therefore (assuming the normal or default reading for both sentences) the horizontal vs. vertical distinction **must** be expressed by the semantic difference between these two words. In both cases we have S-1M1F, more precisely: 'horizontal' = *table* in (18) and 'vertical' = *wall* in (19). – Next, let us consider these two German sentences:

(20) Das Gemälde liegt auf dem Tisch
(21) Das Gemälde hängt an der Wand

Now, clearly, the horizontal vs. vertical distinction is expressed by the prepositions *auf* vs. *an*. But since the semantic difference between *Tisch* and *Wand* is exactly the same as that between *table* and *wall*, the horizontal vs. vertical distinction, which in the English sentences is expressed **only** by *table* vs. *wall*, must in the German sentences be **also** expressed by *Tisch* vs. *Wand*, even if 'secondarily'. Moreover, the posture verbs *liegen* vs. *hängen* repeat the same distinction. Thus, the horizontal vs. vertical distinction is expressed here by **three** separate forms, which means that we have the situation S-1M3F. –There are closer English equivalents of (20) and (21), but this is not the point.

Having examined one part of the whole, let us examine the whole itself, i.e. the entire sentence-meanings (18)-(21). Are they compositional or not? Both (18) and (19) consist of six words each of which contributes its own meaning to the global sentence meaning. For instance, *on the table* can be replaced by such variants as *under the table, on this table, on the chair*. Thus, (18) and (19) seem to satisfy the "building-block metaphor", which underlies the very idea of compositionality (cf. Langacker 1987: 452), and was already espoused by Apollonius Dyscolus.

On reflection, however, it turns out that this assessment could not have been made without a few simplifications. Any finite verb expresses several grammatical meanings, as will

be shown by the discussion of (23), and this is true also of such a 'minimal' verb-form as *is* in (18) and (19). For simplicity, it may be stipulated that in this context *is* expresses only affirmation, as opposed to the negation *is not*. With this qualification, we have here as good an example of "full compositionality" as possible.

This is an important result. Compositionality turns out to be **identical** with the (syntagmatic) 1M1F principle. Let us assume that sentences like *Young men gulped down dark beer* exemplify the following type of structure:

(22) [[AB][CD][EF]]

Thus, (22) is a hierarchy with three distinct levels, i.e. sentence, phrase, word. The 1M1F principle must be valid at each level, or in the top-down direction: S-1M1F (= sentence) > S-3M3F (= phrase) > S-6M6F (= word). Now it becomes clear that **purely** semantic compositionality is not a coherent notion. Why not? Because compositionality is identical with 'one meaning – one **form**'. It is not possible to imagine a semantically compositional structure where meaning has no systematic relation (or no relation *tout court*) to form.

Two qualifications need to be added. First, purely formal compositionality is of course a coherent notion (cf. Section 3). Second, 'semantic' compositionality is viable if the content of 'semantics' is enlarged so as to encompass methods of constructing ontological structures of increasing complexity. This idea is exemplified by the 'reality algebra' contained in Montague grammar, with the primitive notions *e*, *t*, and *s* (= thing, truth-value, and possible world) (cf. Itkonen 1983: 142-162).

In conclusion, a basic shortcoming of the notion of compositionality needs to be addressed. Let us consider our example (6), i.e. *Men drink beer*. It is clear that one meaning, i.e. 'animateness', is expressed by the two forms *men* and *drink*, just as 'liquid' is expressed both by *drink* and *beer*. This result can be generalized, mutatis mutandis, to all sentences of all languages. It is normally said that the words of a sentence must be 'compatible' with each other. Two words can be (semantically) compatible only if they share a common meaning, which amounts to S-1M2F. Perfect compositionality is conceptually impossible. Saying that 'animateness' is 'expressed' by *men* but (only) 'implied' by *drink* does not affect this conclusion.

10) Numerical measures for 'whole > parts'

In Section 2 we started by claiming that there is no numerical sense in which the whole *<x,y,z>* is **more** than the list of its parts or *{x,y,z}*. The situation needs to be re-assessed, now that we have introduced the 1M1F point of view.

A) The argument

At this point I am in a position to apply part of the argument that was presented in Itkonen (2013: 31-35). Consider this Yoruba sentence:

(23) ó rí i = s/he saw (or found) it

Taken as a **whole**, (23) is a syntagmatic entity consisting of three **integrated** parts, namely the words *ó, rí*, and *i* in the order exhibited by (23). As always, there must be a **list** which, corresponding to the whole, contains its **disconnected** parts. As the members of such a list, these three words are assigned the following meanings by Rowlands (1969): *rí* = 'to see' or 'to find' (p. 273); *ó* = '(unemphatic) subject pronoun' (p. 15); *i* = "vowel of the verb repeated"

= ‘(unemphatic) object pronoun’ (p. 19). Thus, there are three forms and three meanings, summarized as follows:

(24) {ó, rí, V} = 3M3F

As members of a list (= unordered set), *ó, rí,* and *V(owel)* cannot of course be syntagmatic units. (This is also why the object pronoun is presented as V, i.e. **before** it is **as**similated to the vowel of *rí* and **dis**similated from the tone of *rí*.) On the other hand, they are not paradigmatic units either. From the paradigmatic point of view, the word-form *rí* has **three** meanings: ‘to see’); ‘to be’ (in connection with phonaesthetic adjectives), as in *ó rí wúruwùru* (‘it is untidy’, p. 155); ‘formerly’ (i.e. *ó ti V* = ‘s/he just V-ed’ vs. *ó ti V rí* = ‘s/he used to V’, as in *mo ti ḿmu sìgá rí* = ‘I used to smoke cigarettes’, p. 78). But only the meaning ‘to see’ is relevant here, because the other meanings are not (disconnected) parts of **this** whole, i.e. (23). Thus, the units of (24) should be called **pre-syntagmatic** rather than paradigmatic.

(24) is secondary vis-à-vis (23). In just the same way, when an institution is conceptualized as a network of relevant social roles, it is only secondarily that these can be enumerated in a list.

If (24) has three forms and three meanings, what about (23) as a **whole**? This is the crucial question. The English translation already gives a rough idea of the grammatical meanings expressed by (23), but let us make this more precise. We need to exploit the general structuralist principle which says that in any system a unit is what the other units are **not**: “Leur plus exacte caractéristique est d’être ce que les autres ne sont pas” (de Saussure 1916/1962: 162); in other words, “omnis determinatio est negatio”, as Spinoza put it. In the Yoruba context, (23) exemplifies what Keenan (1976) calls “semantically basic sentence” (= SBS). When we compare (23) with its closest neighbours, each of which has a **form** (minimally) **more complex** than (23), each comparison elicits one grammatical meaning expressed by, or contained in, (23):

(25) yó rí i	s/he will see it	future
(26) ó ńrí i	s/he used to see it	habitual
(27) … ó bá rí i	(that/if) s/he might see it	non-factive
(28) ó di rírí	it was found	passive
(29) rírí l’ó rí i	s/he really saw it	focal
(30) kò rí i	s/he did not see it	negative
(31) ó rí i bi?	did s/he see it?	question

Thus, (23) turns out to express the following grammatical meanings: (i) past, as opposed to (25); (ii) completive, as opposed to (26); (iii) factive, as opposed to (27); (iv) active, as opposed to (28); (v) non-focal, as opposed to (29); (vi) affirmative, as opposed to (30); (vii) assertion, as opposed to (31). The presence of these grammatical meanings in (23) is undeniable, perhaps apart from (v). Its inclusion can be defended, however, given the extraordinary frequency of the focal construction (here: *rírí **ni** ó rí i* > *rírí l’ó rí i*).

In moving from (24) to (23), we move from a {list} of units to a <structure> where the units stand in a definite **relation** to each other; and in (23) the structure/relation is literally identical with the **order** of the listed units. It is not an additional formal element that should be added to the (lexical) forms contained in the list. The meaning-form ratio of (23), when all lexical and/or grammatical meanings are taken into account, is as follows, with the **same** number of forms as in (24):

(32) <ó, rí, i> = 10M3F

Let us recall that, according to Nagel (1961: 388), it is a trivial truth that a whole like (32) is more than the list of its parts, i.e. (24). The eventual interest of the (24) vs. (32) comparison resides in the fact that, unlike in connection with (1) vs. (2) etc, it now becomes possible to have a **numerical measure** that shows the exact degree to which the whole is greater than the sum of its parts. This is one way to give substance to the 'whole > parts' thesis, even if it may not be exactly what its proponents have had in mind.

In a more careful analysis, it should be said that the pronoun *ó* **cumulatively** expresses the following three meanings: 'agent/subject', 'third person', and 'singular'; and this is true, mutatis mutandis, of *i* as well. But the important point is that the number of these (grammatical) meanings is **the same** in the list and in the sentence. Therefore, for simplicity, we may ignore here the 'separative vs. cumulative' distinction and say that each of the forms *ó* and *i* expresses just one meaning. This is how we get the numbers 3M3F and 10M3F for *{ó,rí,i}* and *<ó,rí,i>*, respectively.

This result can be generalized in an obvious way to (5) & (6). The list (5) *{men,drink,beer}* contains three (lexical) forms and three lexical meanings; the meaning of *drink* is an abstraction roughly comparable to *V(owel)* in (24): it becomes definite only in the sentence context. There are also two grammatical meanings involved, namely PL (of *men*) and SG (of *beer*), but they can be ignored. Because they are just repeated in the sentence (6) *<men,drink,beer>*, they contribute nothing to differentiating between the list and the sentence. Because the list enumerates the parts of the sentence (i.e. of 'the whole'), it is true by definition that the list and the sentence(-structure) contain the same number of **parts**, i.e. lexical or grammatical **forms**, with only the difference that they are disconnected in the list and integrated in the sentence. Just as in connection with (23), the interest lies in the **meanings** contained in the structure but **not** in the list. As for (6), which comes close to exemplifying the SBS in English, these new meanings include at least the following: present, factive, active, affirmative, assertion. To sum up:

(5) {men,drink,beer} = 3M3F vs. (6) <men,drink,beer> = 8M3F

Again, the whole is (much) greater than the sum of its parts. A look at (5) vs. (6) and (24) vs. (32) reveals that that not just the number of (formal) parts but also the number of **lexical** meanings is the same in the {list} and in the <sentence>. The asymmetry between the list (= 'less') and the sentence (= 'more') is due to the fact that the latter contains a greater number of **grammatical** meanings. And this is in turn due to the fact that, apart from (the mutual order of) the lexical forms, a lot of grammatical meanings are expressed by **zero**: it is enough that words are just put together to form a sentence. (To be sure, there are rare cases where lexical meanings too are expressed by zero; cf. (42) and (43) below.) It follows that, as the number of overt (meaningful) forms increases, the list vs. sentence asymmetry is likely to decrease. Still, it never disappears entirely. Measured by the number of meanings expressed, the whole sentence will always be greater than the sum (= list) of its parts. The same may not be true of all subsentential wholes (cf. Subsect. 12-B).

A look at (32) reveals that we are dealing with **cumulation**: 'syntagmatically, more meanings than forms'. Customarily, cumulation is taken to be a property of morphemes (cf. Velupillai 2012: 104), but here we have an instance of **sentence-level** cumulation.

Let us repeat that, with respect to **word lists** like (24) and (5), 'disconnected' is replaced by 'pre-syntagmatic', whereas with respect to **sentences** like (32) and (6), 'integrated' is replaced by 'syntagmatic'. The mutual relation of pre-syntagmatic and syntagmatic is concealed by orthography in the case of *ó* and *rí* but is better illustrated by the difference between *V* and *i*.

B) Qualifications

At first, it may be thought that grammatical meanings must have non-zero expressions in polysynthetic languages like West Greenlandic. However, the form of the SBS is no more complex in West Greenlandic than it is in Yoruba:

(33) taku-vaa
see-3SG.AG→3SG.PAT
s/he saw him/her/it

The list is as follows: *{taku-, -vaa} = 3M2F*. That is, the (polysynthetic) sentence (33) is formally even **less** complex than the (isolating) sentence (23), given that it has only **two** forms: whatever its etymology, from the synchronic point of view the suffix *-vaa*, which expresses the AG/PAT relation and thus corresponds to *ó __ i*, exemplifies cumulation, or S-2M1F. (This fact is relevant for the *ó rí i* vs. *taku-vaa* contrast, even if it is not relevant for the *{taku-, -vaa}* vs. <*taku-, -vaa*>contrast.) The precise number of the new grammatical meanings in the structure <*taku-vaa*> must be determined in the same contrastive way (applied to West Greenlandic data) as it was done by means of (25-31) in connection with (32).

In general, the exact status of zero-expression has been poorly understood. According to Croft (2003: 103), for instance, the English sentence *This car-ø run-s* expresses the following grammatical meanings: DEM.SG (= *this*), SG (= *-ø*), 3.SG.PRES (*-s*). But this is far from sufficient. Surely at least the following meanings, expressed also by (6), (23), and (33), must be added: factive, active, affirmative, assertion. We encounter here "the blind spot of current typological linguistics", to repeat the title of Itkonen (2011c). A few corrections, long overdue, have been offered in Itkonen (2013).

The argument was presented here in the simplest possible form, namely by using SBS's, and more precisely such SBS's where there is no doubt about word-boundaries, as in (6) and (23), or about the lexical vs. grammatical boundary, as in (33). (It is immaterial that *ó* and *i* might equally well, or even better, be regarded as affixes rather than full-fletched words.) When the amount of grammatical forms increases, there will inevitably be disputes about the proper way of segmentation. But none of this needs to concern us here.

C) Implications

Apart from rare exceptions, the numerical measure is given by the number of grammatical (and not lexical) meanings. Therefore the 'whole vs. parts' perspective has revealed a definite asymmetry between lexical and grammatical meanings. It would remain hidden if the existence of the lexical vs. grammatical distinction is denied a priori, in the spirit of the following statements: "There is no meaningful distinction between grammar and lexicon" (Langacker 1987: 3). "I do not believe that … the distinction between grammar and lexicon … can ultimately be maintained" (p. 449). Croft (2001: 17) agrees: "Thus, there is a **continuum** between the lexicon and syntactic constructions. … [T]he internal structure of words are also constructions. … In other words, construction grammar has generalized the notion of a construction to apply to any grammatical structure, including both its form and its meaning. … (compare Langacker 1987: 25-27, 35-36)."

If there is a continuum between grammar and lexicon, the distinction between the two is gradual, not absolute. But it is just a mistake to think that gradual distinctions are no ("meaningful") distinctions at all. Several examples of the same fallacy are discussed in Itkonen (2016). Let us add one more example: Because there is no definite boundary between dictionary and encyclopedia, it is inferred that all meanings are encyclopaedic. The underlying fallacy was

exposed by Pap (1958): “But to deny a distinction because of its vagueness is, of course, a semantic naiveté of the first order” (p. 401). Or to put it more eloquently: “the existence of pink does not undermine the distinction between red and white, and dawn does not indicate that day and night are really [or “ultimately”] the same” (Paulos 1988: 63). In an everyday context it is easy to understand that gradual distinctions are meaningful (just think of day vs. night or rich vs. poor), but comparable understanding becomes nearly impossible in an esoteric context like theoretical linguistics.

D) Summary

The phenomenon exemplified by (23) is thoroughly familiar. And yet, if viewed from some distance, as it were, it looks almost miraculous. The list of the parts is quite unimpressive: two vowels (= *ó, i*) and one syllable (= *rî*), with just three meanings of their own. But when they are put together, a very complex whole of ten meanings literally emerges, as if by some sort of *l’alchimie du verbe*. The idea of **emergence** is indeed fully justified here, in the sense of **more**. (Let us recall that water, qua emergent, is certainly different from, but not more than, hydrogen-cum-oxygen.) On reflection, of course, this type of emergence can be explained down to its last detail; and the explanation is provided by the notion of **basic use** (exemplified by the SBS’s). What people communicate most often, must be given the shortest expression. It **must** be so. Thus, the example (23) reveals the ultimate **rationality** of speakers, as sedimented in language, and by the same token, the essence of (linguistic) functionalism (cf. Itkonen 2013).

What Whitney (1979/1875) says about the entire Chinese language, is just as true about the SBS’s of particular languages, like (6), (23), and (33): “language is only an instrumentality, and the mind the force that uses it; …the mind, which in all its employment of speech implies a great deal more than it expresses, is able to do a high quality of work with only the scantiest hints of expression, catching from the connection and from position the shades of meaning and the modes of relation which it needs” (p. 238).

Let us accept ‘structure’ as a superordinate notion which, in the spirit of the previous paragraph, subsumes both ‘language’ and ‘sentence’. The gist of the subsections A-C may then be summarized as follows: “That [structure] ranks highest which goes furthest in the art of accomplishing much with little means, or, in other words, which is able to express the greatest amount of meaning with the simplest mechanism” (Jespersen 1965/1922: 324).

11) One meaning – one form’ as a dogma: monoexponentialism

“The universal default is to express each category by a dedicated formative. These are **monoexponential** (or separative) formatives. **Polyexponential** (or cumulative) formatives, i.e. formatives which simultaneously code more than one category, are much rarer” (Bickel & Nichols 2005: 90). These statements are contradicted by the data reviewed in what precedes. The “categories coded on the verb” are said (p. 94) to include the following: agreement (= AG/PAT person), tense, mood, voice, polarity, illocution (= speech act). If the monoexponentialist thesis were true, “the universal default” would be for all verbs of all languages to have (at least) **six** separative formatives, in addition to the lexical root/stem. Anyone who has even casually glanced at any natural language knows this to be false. For instance, apart from AG/PAT persons, **none** of these (or any other) categories is expressed by dedicated formatives in (6), (23), or (33), which qua SBS’s represent the most **frequent** sentence types of the respective languages.

So how is it possible to deny the existence of ubiquitous cumulation? It is simply defined out of existence. If **many** tense/aspect/mood (= TAM) categories are (cumulatively) expressed by a single formative, they are counted as **one** category, “thereby avoiding difficult

decisions as to whether something is aspect or tense or mood" (p. 95); and the same goes for formatives cumulatively expressing TAM and illocution (as well as affirmative polarity). Thus, whether S-2M1F remains a possible option, depends on the whim of the analyst. Although empirically true, it is ruled out whenever it is felt to be "difficult".

S-1M2F is disposed of in the same way: **One** category is counted as **many** if it is expressed discontinuously: when one category is simultaneously expressed at several places (in the verb), "we counted the category twice (or more)" (p. 95). Hence, S-1M2F, although present in practically all languages, is made to disappear at will.

The same claims are repeated in Velupillai (2012): "It is much more common for languages to have separative morphemes than cumulative. In Bickel & Nichols' (2011) database 127 languages (or 79.4%) have separative markers for tense/mood/aspect, while 29 (18.1%) have cumulative markers …" (p. 106).

After these strongly negative remarks, it is only fair to mention the type of data which at least approximates the ideal of monoexponentialism. Logically enough, it must be the opposite of SBS's, and especially in a language like Turkish. Consider the following sentence, suggested Whitney (1979/1875: 233):

(34) sev-ish-dir-il-e-mi-yor-du-k
love-RECIPROC-CAUS-PASS-'cannot'-NEG-CONT-PRET-1PL
we were not being capable of being made to love each other

But notice that even this fine example of (almost) 1M1F has no exponents for 'assertion' and 'affirmative'.

The notion of monoexponentialism is scrutinized at length in Itkonen & Pajunen (2011: 105-112), and more succinctly in Itkonen (2013: 36-37).

12) The case for 'whole < parts'

The examples (6), (23), and (33), which justify 'whole > (list of) parts', illustrate this general notion: 'more meanings in the structure than in the list'. By the same token, 'whole < parts' ought to be justified by the opposite situation: 'less meanings in the structure than in the list'.

A) Idioms

If we disregard the grammatical meanings, the sentence *John drank beer* has as many **lexical** forms and meanings as the corresponding list, namely three: {3M3F} = <3M3F>. This is why it qualifies as (lexical-)compositional. By common consent, idioms are **non**-compositional and thus deviate from S-1M1F. Let us consider Croft's (2001) favourite idiom, namely *to kick the bucket* (p. 26, 56), as in the sentence *John kicked the bucket.* The corresponding list has three lexical forms and meanings whereas the sentence has the same number of lexical forms but only two lexical meanings, namely 'John' and 'died', the latter being idiomatic:

(35) {John, kicked, the bucket} = 3M3F vs. <John, kicked, the bucket> = 2M3F

It has been maintained that because idiomatic meanings are non-predictable or emergent, they support the 'whole > parts' position. This is a mistake. They certainly support the 'whole ≠ parts' position, but – as we just saw – here the whole is **less** than the sum of its parts.

B) Agreement

'Whole < parts' is also exemplified by the notion of **repetition** or **agreement**. We have already seen incidental exemplifications of this general idea: 'horizontal /vertical surface' is expressed three times in the German sentences (20) & (21) while the meaning 'singular' is expressed by three distinct forms in the sentence *This car-ø run-s*. A more transparent example is provided by the Finnish ADJ + N agreement:

(36)	iso-**i**-**ssa**	punais-**i**-**ssa**	talo-**i**-**ssa**
	big-PL-INESS	red-PL-INESS	house-PL-INESS
	in (the) big red houses		

Each of the three words in (36) has 3 forms and 3 meanings. Hence the corresponding {list} contains 9 forms and 9 meanings (i.e. 3 lexical and 6 grammatical meanings): 9M9F. The <structure>, i.e. the corresponding noun phrase, contains 3 lexical meanings (= 'big', 'red', 'house') but only 2 grammatical meanings (PL, INESS): 5M9F. That is, the noun phrase, **taken as a whole**, has just the two grammatical meanings 'plural' and 'inessive', not three exemplifications of each. It follows that the whole is indeed **non-additive**, but not in the standard sense in which the whole is **more** than the sum of its parts, but in the non-standard sense in which it is **less**. Thus, ignoring PL and concentrating on the meaning INESS (plus its expressions), we get:

(37) {INESS, INESS, INESS} = 3M3F vs. <INESS> = 1M3F

It may be objected that while in (36) each of the two grammatical meanings PL and INESS is expressed by three distinct forms (i.e. three exemplifications of *-i-* and *-ssa*, respectively), these are token-distinct but type-identical, and therefore really just one form. The reply is that agreement between units belonging to different declensions obtains also between type-distinct forms, as in the Latin *ingeni-**um** mobil-**e*** ('character-NOM.SG.N versatile-NOM.SG.N' = 'versatile character'): 1M2F.

The following Swahili sentence exemplifies both N + ADJ agreement and N + V agreement:

(38)	vi-su	vi-dogo	vi-li-tosha
	PL-knife	PL-small	PL-PRET-suffice
	The small knives were enough		

First, the NP has two parts, namely *vi-su* (= N) and *vi-dogo* (= ADJ), each of which contains the meaning PL (plus CLASSIFIER); thus, in the list *{vi-su, vi-dogo}* the sum of the PL meanings is 2. By contrast, the NP *<vi-su, vi-dogo>*, taken as a **whole**, has only one PL; and 1 < 2. Second, the sentence (38) has two parts, namely *vi-su vi-dogo* (= NP) and *vi-li-tosha* (= V, or VP), each of which contains one PL; thus, in the corresponding list *{NP, V}* the sum of meanings is 2. By contrast, the sentence (38), taken as a whole, has only one PL. Again, 1 (the whole) < 2 (the sum of the parts).

In anticipation of (43), let us add one more example of agreement. In Wari', there is the following contrast: *mao na* ('s/he went') vs. *mama nana* ('they went'), which means that the (semantic) SG vs. PL distinction is expressed **twice** (PL being expressed by means of reduplication), namely both in the verb and in the subject clitic. (More precisely, the clitics *na* and *nana* cumulatively express both subject person and tense/modality.)

As suggested by (23) & (25)-(31), entire sentences always exemplify 'whole > parts' rather than 'whole < parts'. Still, it is interesting to learn that sentences may contain **sub**-wholes with the latter characteristic, as shown by the NP's in (35) and (37). Just as interestingly, the same is true of entire sentences, if considered from one definite point of view such as agreement, as shown by (38). Notice that here too, the list and the structure contain the same number of **lexical** meanings, but different numbers of **grammatical** meanings. Again, we see a confirmation of the lexical vs. grammatical asymmetry, but in a sense opposite to the asymmetry revealed by (24) vs. (32).

It was the purpose of (6) and (8) to show that there is an analogy between a sentence and an institution insofar as they both exemplify 'whole > parts'. This type of analogizing can be pushed even farther. As far as 'whole < parts' is concerned, it is possible to see agreement as analogous to **collective behaviour** where a group of persons, momentarily united and motivated by a common goal, acts like a single person.

C) Perceptual gestalt revisited

The foregoing does not yet exhaust the scope of 'whole < parts'. Lakoff (1987) makes the following suggestion: "grammatical constructions may constitute gestalts, where the whole is conceptually **simpler** than the sum of the parts" (p. 486-487; emphasis added). "[T]he entire ICM [idealized cognitive model] is understood as being psychologically simpler than its parts – hence the term *gestalt*" (pp. 489-490). This is an interesting reversal of the standard non-reductionist view.

In order to understand Lakoff's claim, we must look anew at the perceptual process depicted by (9) vs. (10), concentrating, in particular, on the **output** (10). On reflection, it has two slightly (but importantly) different readings, depending on the exact time-point. A distinction has to be made between the **perceived** whole C and the (perceived-cum-)**analyzed** whole (A' + D' + B'). Once we have learned to perceive a familiar phenomenon as a gestalt, this is indeed simpler than the sum of its parts; thus, at t-1: C = 1 < (A' + D' + B') = 3. But this learning process can always be reversed, and in theoretical analysis it **must** be; thus, at t-2: C = (A' + D' + B') = 3. Notice, incidentally, that the 'perceived vs. analyzed' distinction is not the same as Langacker's (1987: Chap. 12) distinction between compositionality and analyzability.

Lakoff's (1987) position may be generalized, but also trivialized, as follows: if C = (A' + D' + B'), then there is **one** whole and **three** parts; and 1 < 3. Thus, the (perceptual) whole is by definition less than the sum of its parts. On this interpretation, the whole must be non-reductionist, because what is less cannot be reduced to what is more.

Let us conclude with a historical remark. In connection with (9) vs. (10), we saw that, roughly speaking, the perceptual mechanism **creates** something which, to begin with, was **not** there. At a more abstract level, however, perception certainly involves **deleting** something which **was** there. On perceiving a chair, for instance, the output is very much **less** than the input, i.e. the concrete chair. Aristotle conceptualized this situation by means of his 'form vs. matter' distinction: things have both, i.e. they are 'formed matter'; but when they are perceived, what the mind receives is only their forms, just as a piece of wax receives the impression of a golden signet-ring but without the gold (*De Anima*, Book II, Chapter 12).

13) 'Whole > parts' and normativity

Let us agree that in English there is a whole which has the following parts: *men*, *drink*, and *beer*. They occur in the SVO order exemplified by (6). But they could, in principle, occur in the VSO order exemplified by (39):

(39) *Drink men beer

What is the **force** which brings about (6) rather than (39)? In answering this question, let us take our cue from Jackendoff (1994: 49-50). As he sees it, a sentence like **Amy nine ate peanuts* is "not a possible sentence of English". But this cannot be right. Not only is it a **possible** sentence, but it is also an **actual** one, as we can verify by looking at one of its utterances that occurs in space and time, namely on this very page. More precisely, it is an actual **incorrect** sentence. This is what Jackendoff tries to say, but does not quite succeed. Because (in)correctness is the basic normative notion, we now realize that the tie that binds the parts together is provided by one of the **norms** of the English language.

This issue has been discussed in an illuminating way within the Arab linguistic tradition (cf. Itkonen 1991: 132-134, 150-151). In Classical Arabic, the basic sentence structure is VSO, and just as causes precede their effects, so *V* is thought to **cause** *S* and *O* to be in nominative and accusative, respectively; and in the *PREP + N* construction it is *PREP* which is thought to **cause** *N* to be in genitive. It was clearly realized, however, that this is 'causation' only in a metaphorical sense: "Therefore at the level of language there can be at most some sort of 'quasi-causality': it **ought** to be that within a sentence [the verb] is followed by [N-NOM]. By contrast, there is genuine causality at the level of the speaker. He has internalized the (social) norm concerning the nominative ending, and this (psychological) internalization, combined with the occurrence of a relevant speech intention, causes him to add the nominative ending after [N-] when [the verb] precedes" (p. 150).

De Saussure (1962/1916) captures the normative character of linguistic wholes with the aid of the following analogy: "Sous ce rapport on peut comparer la langue à une symphonie, dont la réalité est indépendante de la la manière dont on l'exécute: les **fautes** que peuvent commetre les musiciens qui la jouent ne compromettent nullement cette réalité" (p. 36). When combined with the view that "la langue est une institution sociale" (p. 33), this quotation neatly summarizes the content of Subsections 2-C & D & E. The very essence of normativity is expressed in the remark that **incorrect** (results of) actions, like (39), neither refute the existence of a norm nor falsify the corresponding statement. Why? Because these are about **correct** (results of) actions, like (6) (cf. Itkonen 1978: 156-168; 2003: 15-21).

There is a clear sense in which normative entities are **more** than their either physical or perceptual 'substrata'. A sentence like (6) is experienced quite differently by those who know English and by those who do not; and the latter must fail to grasp the crucial difference between (6) and (39). The basis of this difference is explained as follows: "But the correctness of a performance is not among its perceptual characteristics: it cannot be because it is a **relation** between the performance and an adopted rule – a relation which is more fully expressed by the statement that the performance conforms to the adopted rule" (Körner 1960: 117; emphasis added).

14) 'Whole > parts' and predictability

"In T[ransformational] G[rammar] it is customarily said that a grammar **explains** a sentence by **generating** it. In this context the terms 'explain', 'predict', 'produce', 'deduce', 'generate', etc. are used synonymously" (Itkonen 1978: 239). It is in the same rather diffuse sense that within grammatical description the whole is claimed to be, or not to be, 'predicted' from its parts. Just as well it could be said that an axiomatic theory either 'predicts' its theorems or fails to do so. This is **not** the standard sense in which 'prediction' is used in philosophy (of science) (op. cit., pp. 4-9).

If we want to have genuine predictions, we must look elsewhere. In each language, the SBS is the formally minimal sentence, i.e. the closest approximation to zero-expression and

therefore the best example of 'whole > parts' (as defined in Section 10). What are its properties? This can be predicted fairly accurately. The SBS typically expresses those grammatical meanings that are expressed by (23): 'assertion', 'affirmative', 'active', 'factive', 'past' (or 'present'). Of course, the 'active' meaning exists only where it is in contrast with such meanings as 'passive', 'causative', 'applicative', or 'antipassive'. Moreover, if 'agent' and/or 'patient' is expressed by zero, it is typically '3SG'.

One must be prepared for (unpredictable) exceptions, as always in cross-linguistic research. For instance, in Pitta-Pitta it is the future, and not past or present, which is expressed by zero (cf. Blake 2001: 127).

One of the most spectacular exceptions is provided by Ancient Tamil (cf. Lehmann 1994: 100-104). When the verb-form is an affirmative-factive declarative, it has the following structure: stem + tense + person. The corresponding negative verb-form has the following structure: stem + NEG + person. Thus, the tense exponent is replaced by the NEG exponent. Amazingly, the exponent for morphological negation is a **zero** in all persons except neuter 3SG & PL. (The lexical, auxiliary, and syntactic variants of negation are ignored here.) As a result, there are contrasting verb-forms like the following:

(40)	paaṭ-in-aan	vs.	paaṭ-ø-aan
	sing-PRET-3SG.M		sing-NEG-3SG.M
	He sang		He did/does/will not sing

Let it be added that, more generally, the role of zero is extraordinary in Ancient Tamil: "Die Auslassung der Kasussuffixe [kommt] im Alttamil bei freien Formen und allen Satzelementen vor, mit dem Ergebnis dass viele Sätze hauptsächlich aus unmarkierten Nominalstämmen bestehen" (Lehmann 1994: 52). Remarkably, both Proto-Tamil and Modern Tamil, i.e. the language stages that either preceded or followed Ancient Tamil, exhibit rich case inflection (for discussion, cf. Itkonen 2011b).

In (40) an extraordinary **grammatical** meaning is expressed by zero. On the other hand, it is extraordinary that any **lexical** meaning should be (systematically) expressed by zero. As explained by Roberts (1997), such a situation obtains in Amele (New Guinea). The basic verb structure is *V-O-S-TAM*, i.e. the verb root is followed by the exponents of Object/Patient, Subject/Agent, and Tense-Aspect-Modality. In (41), for instance, *-ad-* and *-ei-* agree with *uqa* and *meen*, respectively:

(41)	Uqa	meen	eu	hel-ad-ei-a
	3SG	stone	DEM	throw-3PL-3SG-PRET
	S/he threw those stones			

Interestingly, the meaning 'to give', which is in general expressed by a full lexical unit, is here expressed by zero:

(42)	Uqa	ho	eu	ø-it-ad-ei-a
	3SG	pig	DEM	give-1SG-3PL-3SG-PRET
	S/he gave those pigs to me			

An analogous phenomenon occurs in Wari', where the meanings 'to say' and, by extension, 'to think', are expressed just by zero. What is said or thought is expressed by a sentence followed by a clitic. If the clitic is simple, it cumulatively expresses tense/modality and the person of the one who says or thinks; and if it is complex, it also expresses the person of the one who is being talked to or thought about. If the corresponding nouns are added, the clitics agree with them.

The resulting structure, “highly unusual, perhaps unique” (p. 355), is called “verbalized sentence” by Everett & Kern (1997):

(43)	[mao	ta’	]	na
	go.SG	1SG.FUT		3SG.PRES

The bracketed sentence means ‘I will go’. The literal translation of (43) is: ‘*I will go*, s/he says’; but it is more probable that we are dealing with ‘inner speech’, in which case the meaning is simply ‘S/he will go’. As noted by Itkonen (2005b: 176-178), the entire structure could just as well be called ‘sentence-like verb’, because a finite verb is by definition that which is followed by a person & tense clitic like *na* (SG) or *nana* (PL). It follows that units which elsewhere satisfy the criteria of nouns qualify as verbs if they are followed by (e.g.) *na*.

15) ‘Whole vs. parts’ from the causal vs. conceptual points of view

The emergence of water out of hydrogen and oxygen is a **causal/temporal** process, and so is the perception of a non-existent sound (cf. 2-E & F). In these cases, we have **first** (what is taken to be) the parts, and **then** the whole. In linguistics the situation is an opposite one, in a twofold sense. As shown by the discussion of compositionality in Sections 7-9, the temporal change does not occur in the data, but in our focusing on the data: it is only after we have the whole firmly in our focus that we can go on to ask whether or not it can be ‘predicted’ from its parts (to use this misleading metaphor). Hence, there is a stark difference between causal and non-causal analysis. Irrespective of whether or not the results achieved in the former type of research support the ‘whole > parts’ thesis, there is no reason why they should have any bearing on the validity of this thesis in the latter type of research.

Perhaps without realizing it, all (synchronic) grammarians agree with Wittgenstein: “Our problem is not a causal but a conceptual one” (1958, p. 203). And so do, by implication, all psycholinguists, insofar as **their** problem is not a conceptual but a causal one. (Notice that ‘conceptual’ is used here in the sense in which philosophical explication qualifies as ‘conceptual analysis’.) These two types of linguistic research have been scrutinized in Itkonen (1978) and (1983), respectively. There mutual relation may be summarized by saying that the former investigates what is presupposed by the latter. What we have here is a genuine difference. Linguistics is not a monolith.

16) Conclusion

Any discussion of the question ‘whole (= X) > parts (= Y)?’ is meaningful only if, assuming X to be greater than Y, it can be determined **how much** X is greater than Y. Otherwise the question is meaningless and should be replaced by the less demanding question ‘X ≠ Y?’ According to this criterion, ‘X > Y’ is true in linguistics (at least) if X is the number of the meanings expressed by a sentence S while Y is the number of the meanings separately expressed by the disconnected parts of S. ‘X > Y’ is false either if ‘X = Y’ or if ‘X < Y’. The former option is exemplified by compositionality (which, however, exists only under conditions of strong idealization and/or simplification). The latter option is exemplified, with qualifications, by idioms and agreements as well as by perceptual gestalts (on one interpretation).

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