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THE SYNTAX OF SEMANTICS: the basics of building complex structures of meaning

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ABSTRACT

This paper advocates the use of *dialectical analysis* (Temple: 2008-2009; 2011; 2012) in the study of language. This method grew out of two major insights: Vygotsky's 'Analysis into Units' (Vygotsky: 1934) and David Hume's Universal Principles of Human Understanding (Hume: 1748). I argue that the properties of the smallest functional units of a complex whole determine their behavior within the system and thus help us understand the behavior of the whole system. Since the smallest units of all human languages (word-meanings) universally possess psycho-physical, social and historical properties, we can extrapolate a number of linguistic universals that apply without exception in all forms of verbal thought (aka human languages). My generalizations about the universal nature, functions and behaviors of word-meanings in use are supported by examples of how the universal 'sinews' of generalization create and hold together meaning at different levels of complexity (word, phrase, sentence, discourse).

Having extrapolated a number of linguistic universals from the shared properties of all word-meanings, I attempt to explain the mind-boggling diversity of linguistic forms, and discover that it is also caused by the same universal properties of word-meanings. Using mostly Latvian/Russian examples, I show how variations in physical word structure (morphology), arising from the idiosyncrasies of each 'social Mind' spinning its own 'webs of significance,' have a 'tsunami' effect throughout the syntax of every language.

I conclude that, despite the diversity of forms in which associations by resemblance, contiguity and cause/effect are expressed in the grammars of different languages, the basic 'architectural principles' human minds use for building complex structures of meaning are the same in all times and places. Syntax, viewed as ingenious 'technologies' different societies have developed for expressing universal semantic relationships, becomes logically comprehensible. It just may be that a comparative study of the various renditions of generalization in the grammars of different languages may open up new horizons for linguistic analysis.

I. INTRODUCTION

Since 2007, I have been advocating the use of the Dialectical Analysis method in the study of complex systems, such as Language. Critics have argued that, when investigating a complex whole, it is necessary to divide it into sub-problems which require different kinds of expertise; and that, since no single person can research the entire range of the whole's complexity, all we can do is increase the zoom power of analysis and hope to reconstruct the whole from the multitude of collectively captured high definition images, in a 'collage' of knowledge.

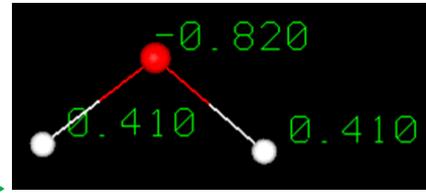
Dialectical analysis does not preclude or minimize the importance of specialized analysis; it just changes its *method*, by assuming that the properties of any complex WHOLE are determined by the properties of its smallest parts; thus, to understand the nature of water, we must first identify its smallest functional unit and study its properties, for they define how the units behave as a whole.

The smallest functional unit of water is its molecule, H₂O: →

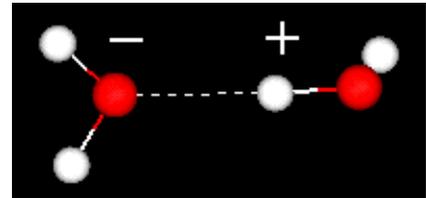


'Why is water liquid within the 0°-100° C range?'

Water molecules are **POLAR**: they have a 'triangular' structure, with hydrogen atoms on one side and oxygen at the vertex. In addition, Oxygen attracts electrons more strongly than Hydrogen, which further enhances the naturally asymmetrical distribution of charge: →



Because water molecules are **POLAR**, they are highly **COHESIVE** (the more positive 'tails' attract the more negative 'heads'): →



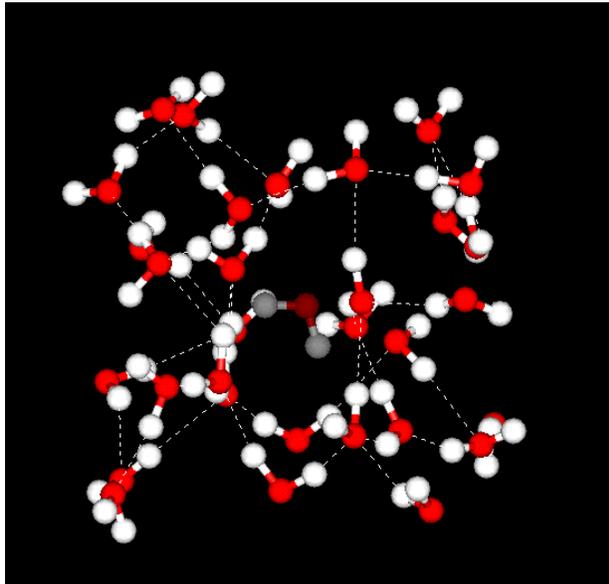
Covalent bonds are stronger than Hydrogen bonds; therefore, in water, hydrogen bonds are continuously forming and breaking up, resulting in partially ordered, liquid structure.

http://www.nyu.edu/pages/mathmol/textbook/info_water.html

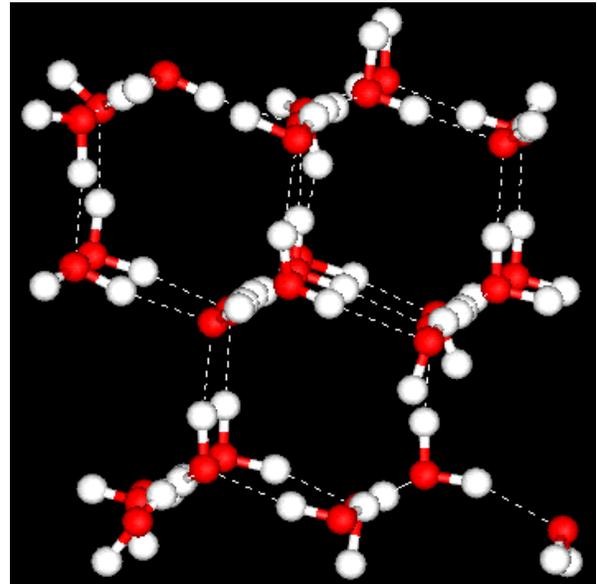
'Why does water expand when it turns into ice?'

In water, with its partially ordered structure, each molecule is hydrogen bonded to approximately 3.4 others. In ice, with its rigid lattice structure, each molecule is hydrogen bonded to 4 others, so the greater 'spaces' between molecules account for the larger volume of frozen water (ice):

WATER



ICE



http://www.nyu.edu/pages/mathmol/textbook/info_water.html

This example clearly shows that the properties of a complex **WHOLE** (in this case, water) are determined by the properties of its smallest units. The dialectical method of linguistic analysis is based on this principle, first postulated by Lev Vygotsky (1896-1934) in his remarkable work "*Language and Thought*" (1934) as 'Analysis into Units.'

In it, Vygotsky claimed that:

- "All previous investigations of thought and language, from antiquity to modern times, ranged between two extremes: they either treated thought and speech as one and the same thing, or split them into two distinct entities and examined them separately. In both cases, a *relationship* between them becomes impossible: If they are one and the same thing, no relationship between them can exist; if they are two distinct processes, the relationship between them can only be a 'mechanical, external connection.'" Therefore, "The analysis of verbal thinking into two

separate, basically different elements precludes any study of the intrinsic relations between language and thought” (Vygotsky: 1934).

- The error has always been in the *method* of analysis: it calibrates our perspective, determining the way we see the object of our investigation. Decomposing complex psychological wholes into elements “may be compared to the chemical analysis of water into hydrogen and oxygen, neither of which possesses the properties of the whole and each of which possesses properties not present in the whole. The student applying this method in looking for the explanation of some property of water why it extinguishes fire, for example, will find to his surprise that hydrogen burns and oxygen sustains fire. These discoveries will not help him much in solving the problem. Psychology winds up in the same kind of dead end when it analyses verbal thought into its components, thought and word, and studies them in isolation from each other. In the course of analysis, the original properties of verbal thought have disappeared. Nothing is left to the investigator but to search out the mechanical interaction of the two elements in the hope of reconstructing, in a purely speculative way, the vanished properties of the whole” (Ibid.).
- This change of perspective “shifts the issue to a level of greater generality; it provides no adequate basis for the study of the multiform concrete relations between thought and language that arise in the course of the development and functioning of verbal thought in its various aspects. Instead of enabling us to examine and explain specific instances and phases, and to determine concrete regularities in the course of events, this method produces generalities pertaining to all speech and all thought. It leads us, moreover, into serious errors by ignoring the **unitary nature of the process** under study. The living union of sound and meaning that we call word is broken up into two parts, which are assumed to be held together merely by mechanical associative connections” (Ibid.).

As a result of this shift in perspective, we have been unable to capture that creative *energy* of Language which Wilhelm von Humboldt, “one of the profoundest and most original thinkers on general linguistic questions in the nineteenth century”¹ called *energeia, Tätigkeit, Erzeugung*:

“The view that sound and meaning in words are separate elements leading separate lives has done much harm to the study of both the phonetic and the semantic aspects of language. The most thorough study of speech sounds merely as sounds, apart from their connection with thought, has little bearing on their function as human speech since it does not bring out the physical and psychological properties peculiar to speech but only the properties common to all sounds existing in nature. In the same way, meaning divorced from speech sounds can only be studied as a pure act of thought, changing and developing independently of its material vehicle. This separation of sound and meaning is largely responsible for the barrenness of classical phonetics and semantics. In child psychology, likewise, the phonetic and the semantic aspects of speech development have been studied separately. The phonetic development has been studied in great detail, yet all the accumulated data contribute little to our understanding of linguistic development as such and remain essentially unrelated to the findings concerning the development of thinking” (Vygotsky: 1934).

Vygotsky concluded that “the qualitative distinction between sensation and thought is the presence in the latter of a generalised reflection of reality, which is also the essence of word meaning: and consequently that meaning is an act of thought in the full sense of the term. But at the same time, meaning is an inalienable part of word as such, and thus it belongs in the realm of language as much as

¹ R.H. Robins. 1990. A Short History of Linguistics, p. 192.

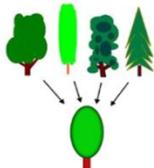
in the realm of thought. A word without meaning is an empty sound, no longer a part of human speech. Since word meaning is both thought and speech, we find in it the unit of verbal thought we are looking for. Clearly, then, the method to follow in our exploration of the nature of verbal thought is semantic analysis – the study of the development, the functioning, and the structure of this unit, which contains thought and speech interrelated” (Vygotsky: 1934).

Dialectical Analysis recognizes the **unitary nature of the process of verbal thought, Language.**

II. Dialectical Analysis of Verbal Thought: Essential Principles

Because Language is Verbal Thought (*thought* in words), the process of *thinking* becomes a major focus of dialectical linguistic analysis. Vygotsky’s ‘Analysis into Units’ and the mechanism of human thought, first described by David Hume in his *Treatise of Human Nature* (1739) and *Enquiry Concerning Human Understanding* (1748), are both essential in dialectical linguistic analysis.

Of course, “The Whole is more than the sum of its parts”²; for example, a man is more than the sum of his ‘body and soul’ – we cannot understand any one aspect of our being in isolation from all the others – there is a dynamic, mutually shaping *relationship* between our physical, psychological, social and historical nature. Similarly, dissection of words into their component parts cannot explain their living energy, resulting from this dynamic and mutually shaping relationship between all aspects of each word-meaning. To understand the workings of the linguistic system as a whole, we must first understand the interconnected properties of its smallest functional units (word-meanings), which are:

1. **Psychological:** every word is already a *generalization* in the collective mind of the society and, therefore, an **ACT of VERBAL THOUGHT:**  Every word is thus a **contiguity** of concept, **caused by resemblance** between concrete experiences connected in collective memory.
2. **Physical:** a word without meaning is empty sound; there is no word without meaning (even ‘nonsense’ has meaning!): ‘meaning comes into existence only through words, it is the criterion of word.’³
3. **Social:** word-meanings are the products and currency of social interaction; they are the generalizations of the collective mind of the speech community, social **signs of meaning**; the double function of every Sign is (a) to *communicate* (b) *meaning*.
4. **Historical:** being the products of living, thinking human minds, word-meanings also live and change in Time:
 - a. Societies live, think, and change in time, so the generalizations of their collective minds will also necessarily change over time: “In the historical evolution of language, the very structure of meaning and its psychological nature also change. From primitive generalizations, verbal thought rises to the most abstract concepts. It is not merely the content of a word that changes, but the way in which reality is generalized and reflected in a word.”⁴
 - b. Individual speakers use the social ‘yarn’ of denotative word-meanings to spin their own ‘webs of significance,’ each ‘web’ with its own unique mosaic meaning, in which word meanings change, depending on how they relate to others in the overall pattern.

² Aristotle: *Metaphysics*, Book I

³ Lev Vygotsky. *Language and Thought* (1934)

⁴ *Ibid.*

Dialectical Analysis thus takes a qualitatively different look at Language: it identifies its smallest functional units, **word-meanings**, and zooms in on their properties, because they ultimately shape the behavior of the whole system. It uses the advantages of both *synthesis* and *analysis*, in that it first analyzes the whole into its smallest functional units, and then focuses on their properties in order to explain the behavior of the whole system. By using both the wide-angle lens of synthesis and the zoom lens of analysis, Dialectical Analysis provides us not only with close-ups of linguistic structures, but also with a high resolution video footage of Language *live*, as it germinated and developed in the collective mind of each society, living *in use* by each generation of its speakers.

Dialectical analysis views Language from a new **perspective** – and perspective is all-important in shaping our understanding of reality, as these photos illustrate:

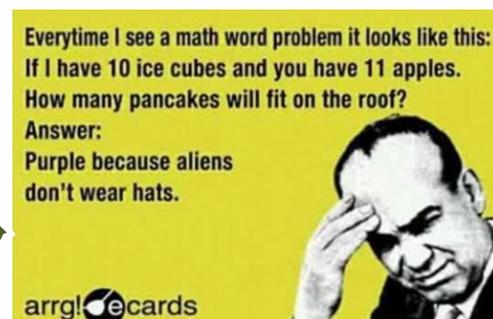


Descriptive linguistics of the 20th century has used an almost exclusively *analytical* approach in the study of physical and semantic structures of language viewed as two *separate* sides of the same coin. Despite some remarkable recent insights into the ‘synthetic’ nature of language,⁵ particularly in the study of grammaticalization and the role of some pre-linguistic ‘natural cognitive constraints’ in shaping it (i.e., metaphoric extension, metonymy and causality), traditional descriptive analysis still predominates in all of the ‘core’ domains of linguistics:

- Phonology still claims the phoneme to be the ‘smallest *unit*’ of language,
- Morphosyntax still uses the traditional ‘fixed’ concepts of noun, verb, adjective and preposition to assign one or another of these functions to a word/phrase it occurs in, based on the word’s morphology and formal ‘syntactic distribution’ tests;
- Semantic theories still rely on the ‘compositionality principle’ in their search for some ‘*objective*’ (or ‘*correct*’) sentence meanings.

Since 2007, I have argued that, because ‘every word is already a generalization and, therefore, an act of thought,’ the mechanism of human thought, first described by David Hume (1711-1776) as the process of associating ideas by resemblance, contiguity in time/space, and by cause/effect, constitutes the **Rational Language Mechanism** which has shaped and continues to shape the words and grammars of all languages (Temple: 2008-2009; 2011).

At LSPNG 2012, I focused specifically on these ‘sinews’ of generalization which hold groups of word-meanings together, forming **chunks** of meaning in use – phrases, clauses, and whole sentences (LLM Vol. 30 No. 2, 2012). These ‘natural’ associations shape all human understanding – we cannot make sense of things, if we fail to perceive them, as in this example:



⁵ Christiansen, M. & Chater, N. (2007); Heine et al. (1991), etc.

In this paper, I want to examine **how**, and **why**, these **universal principles of human understanding** of our 4-D world have found expression in such a glittering variety of ways. Dialectical analysis helps us understand Language and how it works through the study of the properties and behaviors of its smallest units, **word-meanings**. Let us first examine how their psycho-physical and socio-historical properties determine the behavior of all language systems, whatever their ‘architectural style’ may be.

III. LINGUISTIC ‘UNIVERSALS’:

Each word is therefore already a generalisation. Generalisation is a verbal act of thought; it reflects reality in quite another way than sensation and perception reflect it.

Vygotsky: Language and Thought, 1934.

Every word is a generalization – a contiguity of concept, caused by subjectively perceived resemblance between experiences, connected in collective social memory. The process of generalization involves both synthesis and analysis of concrete experiences: to see resemblances, we must also see the differences.

*In order to form a concept, we must be able not only to connect, but also to abstract, to single out its characteristic elements, and to view them separately from the totality of the concrete experience in which they are embedded. ... **Synthesis and analysis presuppose each other, as inhalation presupposes exhalation**” (Vygotsky: 1986, p. 135).*

All word-meanings are the concepts thus formed in social consciousness; they are the products and embodiments of HUMAN THOUGHT whose universal principles govern the genesis and functioning of all linguistic structures. Dialectical analysis extrapolates linguistic ‘universals’ from the **psychological, physical, social and historical properties** of the smallest functional units of *verbal thought* (language):

1. Cohesiveness: *Because every word of every language is born of associations, word-meanings are **cohesive**: like the polar water molecules, they readily associate with others, forming **chunks of meaning**⁶ when in use by living, thinking, and communicating human minds. The associations human minds make between word-meanings in use, like the continuously forming and breaking hydrogen bonds between water molecules, create the flow of speech/thought. Out of shared bits of collectively generalized reality (word-meanings), individual speakers build word mosaics (sentences), each “conveying its meaning ‘in a flash,’ just as a picture ... first perceived as a unity, notwithstanding subsequent analysis into its component coloured shapes.”⁷*

2. Dynamism: Because of their psychological and socio-historical nature, word *meanings* cannot be Saussure’s ‘fixed,’ ‘concrete’ objects – they are volatile, ‘fluid’:

→ Collectively, societies form ideas about the world they live in, generalizing from the perspective of their collective experience; semantic change, including grammaticalization, occurs when there is a shift in the way the society generalizes reality in the word:

*...In the historical evolution of language, the very structure of meaning and its psychological nature also change. From primitive generalisations, verbal thought rises to the most abstract concepts. **It is not merely the content of a word that changes, but the way in which reality is generalised and reflected in a word** (Vygotsky: 1934).*

→ Individually, each Mind’s Eye perceives all sentence mosaics from its own perspective, seeing the patterns of colored tiles (i.e., associations between word-meanings) differently through the lens of

⁶ Collocations, phrases, clauses, sentences, etc.

⁷ Wrote R.H. Robins in his Short History of Linguistics, describing Bhartrhari’s views on meaning (1995, p. 154).

its own experience. The resulting ‘vagueness’ of meaning has so far eluded the probing of semantic theories. ‘Man is the measure of all things,’ said Protagoras (490-420 BC). As water is shaped by its container, so the meaning of all our experiences and perceptions is shaped by each mind: we can make sense of things only in our own heads.

3. THE SMALLEST UNIVERSAL UNIT OF ‘INDIVIDUALIZED’ MEANING – THE ‘SENTENCE’: Because word-meanings are ‘cohesive,’ we easily build **sentence-mosaics** out of them, each projecting an image of its own, embodying each individual’s thoughts (complex generalizations) about the world. Viewed through the lens of dialectical analysis, a **SENTENCE IS THE SMALLEST UNIT OF INDIVIDUALIZED MEANING FORMED BY A NEXUS OF WORD-MEANINGS THAT SAYS SOMETHING ABOUT SOMETHING** (even when parts of the nexus are only implied and not spoken⁸):

Every thought tends to connect something with something else, to establish a relationship between things. Every thought moves, grows and develops, fulfills a function, solves a problem (Vygotsky: 1934).

4. SYNTHESIS & ANALYSIS: THE UNIVERSAL PRINCIPLES OF CREATING INDIVIDUALIZED MEANING (SENTENCE STRUCTURE): Synthesis and analysis of ‘social’ word-meanings is a natural process of verbal thought, shaping all human understanding/structures of meaning; therefore, they are also the two universal principles of sentence structure in all languages:

I. SYNTHESIS is the backbone of each sentence/thought: it bonds what we speak about and what we say about it; every sentence-meaning is a nexus (synthesis) of three main constituents, which may or may not be all *physically* present in the nexus:

- a. **SUBJECT:** ‘what the sentence is about’ – this general definition resolves the so-called ‘problem of subjecthood’ and eliminates the possibility that there might be languages in which Subject is ‘not appropriate,’ as claimed by Dr. Bernard Comrie in his “Language Universals and Linguistic Typology (Comrie: 1989, p. 106).
- b. **VERB:** what we say about the Subject: unlike nouns, they not only *name* actions, but also place them in time, and ‘connect’ with what the sentence is about.
- c. **COMPLIMENT (optional):** this ‘slot’ in the nexus may be left empty, but it can also be filled with Direct/Indirect Objects (DO/IO), Predicate Nouns (PN), or Predicate Adjectives (PA).⁹ In other words, we usually add information to the main ‘nexus’ between the Subject and the Verb – either in terms of describing or re-naming the Subject, or naming the objects of Subject’s action.

II. ANALYSIS (recursion) puts ‘meat’ on the ‘bones’: it adds color, ‘pixels’ to parts of the nexus (sentence mosaic), zooming in on any one (or all) of the three nexus constituents, describing (or naming) them through associations by resemblance, contiguity in space and time, and/or cause/effect.

⁸ For example, “Yes [we can]”; “Темнеет” (Russian for “It is getting dark”); “Она доктор” (Russian for “She is a doctor”), etc.:

⁹ Traditional variations on the SVO theme, distinguished by word order typology, represent only one logical basis for the ‘synthesis’ between what we speak about and what we say about it (Object of the Verb). There are, however, other possible logical ‘links’ between Subject and Predicate (i.e., S/V/C_(Predicate Adjective), S/V/C_(Predicate Noun), and S/V/C_(zero), in whichever order they come). For this reason, dialectical analysis uses SVC/SCV/ VSC/VCS/ CVS/CSV representation of sentence structure in preference to the standard SVO/SOV/ VSO/VOS/ OVS/OSV notation.

As breathing is both inhalation and exhalation, so generalizing is both *synthesis* and *analysis* of ideas drive all human thought/form the matrix of the diverse structures of all sentences.

5. Universal FUNCTIONS of words in the sentence: Because of their psychological and social nature, all words have a *purpose*: we use them to *think* and to *communicate* our thoughts. Each grammar presents an ingenious practical solution to our need to communicate our 'vision' of how events relate to each other (by resemblance, contiguity in time/space, and by cause/effect) in our 4-D world. The so-called universal '*journalistic*' questions "**What? Which? Did what? How? To whom? When, Where, & Why?**" express the universal way we think/associate ideas. Depending on which of these questions the words/groups of words in the sentence answer, they serve different functions. These *perceived* word functions in the sentence are what we call '**PARTS of SPEECH**' – they are the associations we make /relationships we see between word-meanings and groups of word-meanings (phrases and clauses) within the main sentence-mosaic. Parts of speech (word functions in the sentence) mirror the workings of the human minds, which connect ideas by

- **resemblance** (*adjective/ adverb of manner* function),
- **contiguity** in space/time (*adverb of place/time* function), and by
- **cause/effect** (*adverbs of reason, consequence, condition, concession*, etc.).

Naming (the *noun* function) is that **contiguity** of concept, **caused** by **resemblance** between instances – in other words, it is generalization as a result of all three types of association.

Verb function is not just to *name* an action, but to connect it to what the sentence is about (Subject) and to place it in Time (**contiguity in Time**):

*A verb is that which, in addition to its proper meaning, carries with it the notion of time ...
It is a sign of something said of something else.*

Aristotle: De Interpretatione

The functions of '**preposition**' and '**conjunction**' serve the purpose of **connecting** ideas in space and time (**contiguity** in space/time), while interjections serve to 'color' the nexus with the speaker's emotion.

'Parts of Speech' are equally 'Parts of Verbal Thought': these functions serve our needs to describe/ share our experiences through verbal thought (associating ideas by resemblance, contiguity in time and space, and cause/effect. These are the **universal principles of human understanding**; therefore, these functions of word-meanings in the sentence are also universal, the same in all languages (Temple: 2012).

6. Universal functional units of meaning in the sentence – 'PHRASE' & 'CLAUSE': Because of their cohesive and teleological nature, word-meanings often form *chunks* of meaning which *describe, specify, or name* the main sentence constituents (i.e., they function *together, 'in tandem'* as one Adjective, Adverb or Noun within the nexus of the sentence). The difference between phrases and clauses is purely structural: if the words that functions together as one Adjective, Adverb, or Noun form a nexus (S/V/C) of their own, it is a dependent clause; if they don't, it is a phrase.

What words and groups of words actually *do* in each sentence mosaic may be perceived differently, depending on how individuals see the relationships between them and other words in the nexus, due to a multitude of psychological, physical, social and historical factors. If the perceived association is based on:

- **Resemblance**, they function as **Adjectives** (Which? Which kind?) or **Adverbs of Manner** (How?) i.e., "The *can-do* American spirit"; the *out-of-control* government spending; "the *beer-drinking, festival-going* audiences"; "The scandal *that has legs* is the GSA one – that's the one *that sticks*";

“This is rough, *in-your-face* stuff”; “*My heart pounding*, I had this *is-it-really-happening-to-me* kind *of moment*”; “I take it *with a huge grain of thought*”; “*By union*, the smallest states thrive; *by discord*, the greatest are destroyed” [Sallust, Roman Historian (86-35 BC)]; “We look *with our eyes*, but we see *with our mind*,” etc.;

- **Contiguity in space/time**, they function as **Adverbs of Place (Where?)/Time (When?)**, i.e., “She was hanging *with a bad crowd that night*”; “National debt heading *North of three trillion*”; “That was the biggest bone-headed move *on the part of GOP*”; “We’re seeing a light *at the end of the tunnel* – an oncoming train!”; “Our lives shape themselves *around the choices we make*”; “Change was *on the horizon*”; “I was tickled pink *when I saw this*”; “*From primitive generalizations*, verbal thought can rise *to the heights of abstraction*,” etc.;
- **Cause/Effect**, they function as **Adverbs of Reason, Purpose, Concession, Consequence, or Condition**, etc.; i.e., “They are all tripping over each other *to disassociate themselves from the killing*”; “*Despite huge advances in science and technology*, we don’t get any wiser”; “You will get it, *if you really want it*”; “*To understand how Language works*, we must identify and study its smallest units,” etc.

When all three associations create a new concept/ **generalization**, they function as **Nouns**: i.e., “You can *monday-quarterback* all you want,” “This week we’ll see some ‘*face-to-face*’s between Obama and these candidates,” “I am only responsible for *what I say*, not for *what you understand of it*,” “*To be or not to be* – that is the question,” “*What you see is what you get*,” etc.

The same basic associations (by resemblance, contiguity, cause/effect) govern all verbal thought; thus, the same basic word *functions* in (‘Parts of Speech’) and functional units of meaning (phrases/clauses) obtain in the sentences of all human languages. A few examples of **Adverb of Consequence** clauses from different languages:

Indo-European:

English:	I think, <i>therefore</i> I am.
Latin:	Cogito, <i>ergo</i> sum.
French:	Je pense, <i>donc</i> je suis.
Latvian:	Es domāju – <i>tādē</i> es esmu.
German:	Ich denke, <i>also</i> bin ich.
Dutch:	Ik denk, <i>daarom</i> / <i>dus</i> ik ben.
Russian:	Я мыслю; <i>следовательно</i> , я существую.
Greek:	Σκέφτομαι <i>άρα</i> υπάρχω.

African:

Krio of SL:	Ah de tink, <i>so</i> na mi.
Yoruba:	Mo n ronú, <i>nítorí náà</i> mo wa láàyè .
Swahili:	Ninafikiri, <i>kwahiyo</i> nipo.
Afrikaans:	Ek dink, <i>daarom</i> is ek.
IsiZulu:	Ngiyacabanga, <i>lokho</i> kuchaza ukuthi ngiyikho.

Austronesian:

Kuanua:	lau nukia, <i>ba</i> iau iau.
Mussau:	Aghi nongina, <i>aghi</i> anna.
Zia:	Na kotupunena, <i>arare</i> Na ara.
Telei (S.Bougainville):	Nne aposi, <i>eguko</i> nne.

Another set of examples shows **Adverb of Condition** clauses with embedded **adverb of manner** phrases:

Indo-European:

English:	If it looks like a duck, walks like a duck, and quacks like a duck, then it is a duck.
French:	Si cela ressemble à un canard, marche comme un canard et fait couin-couin comme un canard, c'est un canard.
Latvian:	Ja tā izskatās kā pīle, staigā kā pīle, un pēkšķ kā pīle, tad tā ir pīle.
German:	Wenn es aussieht wie eine Ente, läuft wie eine Ente und quakt wie eine Ente, dann ist es eine Ente.
Russian:	Если оно выглядит как утка, ходит как утка и крякает как утка, то это утка.
Greek:	Εαν κάτι μοιάζει με πάπια, περπατάει σαν πάπια και ακούγεται σαν πάπια, τότε (μάλλον) είναι πάπια.

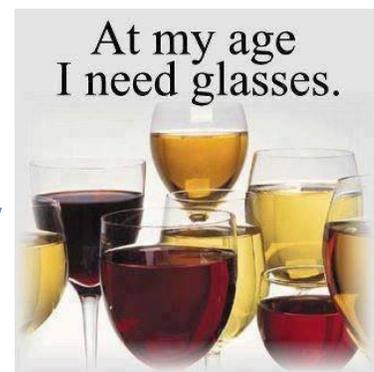
African:

Krio of SL:	I fiba lek doks, i dei waka lek doks, i dei meik nois lek doks, ah tink sei na doks (dis na doks).
Tiv (Nigeria):	Tiv: Alu er kwagh la bee agwagwa, zenden er agwagwa man vaan er agwagwa, yo ka agwagwa.
Yoruba (NG):	Tí ó wo bí pépéyẹ, rìn bí pépéyẹ àti ké bí pépéyẹ, òjé ó jé pépéyẹ.
Swahili:	Kama inafanana kama bata, inatembea kama bata, na kulia kama bata, hivyo ni bata.
Afrikaans:	As dit soos 'n eend lyk, soos 'n eend loop, en soos 'n eend kwaak, dan is dit 'n eend.
IsiZulu:	Uma kufana nge dada, kuhamba nje nge dada, kupinde kukhale nje nge dada, kuyi dada.

Austronesian:

Kuanua:	Ari i gigira dari ra pato, vanavana dari ra pato, ma i tangtangi dari ra pato, io nam ra pato nam.
Mussau:	Arova tatara-ne nongina ghila teva, kasukasu nongina ghila teva, angari-ane nongina ghila teva, ne ghila-i-a.
Zia:	Nele ñu gosi ine awia borowa, ang ine awia borowa, ge ine awia borowa, aniare ñu nia awia borowa.
Telei (S.Bougainville):	Ako nanako nogu ngkasi legu, egu nanako nogu lunglugolugu, egu nanako nogu kaikaigologu, apasi ako tegu nanako.

7. Sentences are *chunks of meaning* (generalization), synthesized from the meanings of all the word-meanings *in the order of their combination* in the nexus; therefore, the meaning and function of each word in the sentence are shaped by the whole pattern of the sentence-mosaic, as it is perceived through each individual Mind's Eye. This accounts for the relative 'independence' of words and their meanings in use, as here:



Thus, the grammatical 'devices' in all languages serve to express the universal associations of the human mind (by resemblance, contiguity in time and space, and by cause/effect):

- **Grammatical gender /adjectives:** association by resemblance;
- **Noun cases:** contiguity in time/space; cause/effect;
- **Verb Tenses:** contiguity in Time, whichever way each social Mind slices it;
- **Aspect:** contiguity in Time + resemblance (what kind of action: complete, continuous, remote or recent, etc.);

- **Voice:** cause/effect (Active: focus on the *agent*; Passive: focus on the action, not so much on the agent), etc.

Conclusion: *Universal properties of word-meanings make them volatile, teleological, cohesive and fluid in use*, thus necessarily *causing* language change in use and over time “within the bounds of anatomy, human cognition, and the exigencies of social harmony ... in a dazzling and infinite variety of permutations.”¹⁰ Human anatomy, as well as social perceptions and preferences shape the phonology (speech sounds and patterns of their combination and distribution) and morphology (word structure) of each language.

Typological studies have documented the vast majority of the world’s language structures. Empowered by digital technology, the WALS project, headed by Dr. Bernard Comrie of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, has built the largest ever database of linguistic structures, easily accessible on wals.info. Yet, the most detailed descriptions of diverse linguistic structures in any of the specialized ‘core domains’ of linguistic science – even those conceding, acknowledging or asserting the interconnectedness of all linguistic features (i.e., John McWhorter’s engaging descriptions of the ‘five faces’ of language change¹¹) – do not explain their *causes*. Aristotle remarked that

We do not regard any of the senses as *Wisdom*; yet, surely, these give the most authoritative knowledge of particulars. But they do not tell us the ‘*why*’ of anything - e.g., *why* fire is hot; they only *say* that it is hot. ... ***Wisdom is knowledge about certain principles and causes.***¹²

Dialectical analysis looks for the *principles* and *causes* of linguistic behavior and change in the properties of the smallest functional units of language, word-meanings. We have seen how the universal psycho-physical and socio-historical properties of word-meanings cause *similarities* between all human languages (the linguistic universals described above).

Let us now look at how these same universal properties of word-meanings cause the *differences* amongst the language systems they make up.

IV. THE CAUSES OF STRUCTURAL DIVERSITY IN FORMS OF MEANING

It is clear that, because societies live and think in time, their collective perceptions and understanding of the world also change in time, molded by common experiences and history which differ from one society to another. People in all times and places use social ‘*signs*’ (word-meanings) to construct and communicate to others their ‘*vision*’ of the world, of how they see things in it and relationships between them in terms of resemblance, contiguity in space and time, and cause/effect. However, because societies generalize about their own experiences, each grammar is bound to be as unique as each collective mind that creates its own practical solution to human *need* to communicate in order to survive. This is why the universal psycho-physical and socio-historical properties of word-meanings will necessarily cause such a dazzling variety of forms of collective generalizations (word-meanings) and ways of putting them together into sentence-mosaics.

¹⁰ McWhorter, J. 2001. The Power of Babel, p. 52.

¹¹ McWhorter, John. 2001. The Power of Babel: a natural history of language, pp. 18-32.

¹² Aristotle: Metaphysics, Book I.

Can *variation in the physical properties (morphology) of the smallest functional units* of different languages *cause* syntactic diversity amongst them?

To follow through on our water analogy, let us see if changes in the physical structure of its smallest units will cause important changes in water properties:

'Heavy' water molecules, instead of ordinary hydrogen (*Protium* = 1 proton + 1 electron), contain its isotope *Deuterium* whose nucleus contains, apart from one proton, also one neutron. That slight structural change causes real changes in water 'behavior': because 'heavy' water is 10.6% denser than ordinary water, ice made of it will sink in normal water:



'Heavy' ice also has a higher melting temperature (+3.8°C), and – this is really important – because **Deuterium is almost twice as heavy as Protium, hydrogen-oxygen bonds in heavy water are much stronger, thus causing differences in biochemical reactions.** That is why, despite being physically and chemically similar to water, high concentrations of heavy water are toxic to living organisms:

“Multi-cellular organisms, if given only heavy water, soon stop dividing and growing. For example, plant seeds will not germinate in heavy water. Mammals given heavy water fall ill from lack of needed blood-cell and intestinal-cell replacement, and die when about 50% of their body-water has been replaced with heavy water.” http://www.princeton.edu/~achaney/tmve/wiki100k/docs/Heavy_water.html

Similarly, an increase in 'morphological weight' strengthens the associative bonds between word-meanings in the sentence, thus causing differences in their behavior in use, when they form complex meanings (phrases/sentences). The heavier a word's morphological structure, the more restricted is its relationship with other word-meanings in the sentence:

1. **Inflectional morphemes**, for example, form stronger associative bonds between certain word-meanings, 'fixing' the way they relate to each other, or *function* in the sentence. This, in turn, results in more flexible word order in inflectional languages. For example, consider this Russian proverb:

[v odno uxo vletelo, iz drugovo vil'et'elo] - Into one ear [it] flew, out of the other [it] flew out.

The inflections (marked in red) indicate **gender** and **case agreement** between the noun and the adjective, 'fixing' their relationship and, therefore, their functions in the sentence. This strong 'bond' between the noun and adjective makes them mobile within the sentence; put together differently, the sentence still has the same meaning:

[vletelo v odno uxo, vil'et'elo iz drugovo] - [it] Flew into one ear, [it] flew out of the other.

2. Derivational morphemes (prefixes/suffixes; prefixes here marked in blue) can, as in this case, indicate the direction of movement (contiguity in space) which, in turn, changes the verb-noun relationship, causing a change in the case of the noun:

[vletel^o v odno ux^o] – here, [ux^o] and its adjective are in the **Accusative** case;

[vi^let^lelo iz drug^{ovo} (ux^a)] – *the other [ear]* (implied) – [drug^{ovo} (ux^a)] – they are in the **Genitive** case (because the noun is only implied, the adjective performs the noun function).

Prefixes also typically affect verb **aspect** (the *kind* of action – association by resemblance and contiguity in time) and, thus, the *meaning* of the verb:

[d ^l elat ^l]	- to do	[stat ^l]	- to become
[z ^l d ^l elat ^l]	- to have done	[fstat ^l]	- to get up

Thus, extensive use of derivational morphemes (prefixes and suffixes) in Russian, Latvian, and other inflectional languages usually adds information about the direction of action (relationship of contiguity in space/time) which also affects the verb-noun relationship (noun case). Prefixes can also affect verb aspect (contiguity in time + resemblance); all of these changes affect the word *meaning*:

Russian:	[jexat ^l]	- to go (by transport);
	[pri jexat ^l]	- to arrive <i>at/to</i> (a place), to come (by transport);
	[u jexat ^l]	- to leave, go <i>away from</i> (by transport);
	[v jexat ^l]	- to enter/arrive <i>into</i> a place (by transport);
	[vi jexat ^l]	- to go <i>out of</i> a place (by transport);
	[z ajexat ^l]	- to drop <i>by</i> (by transport);
	[s jexat ^l]	- to slide <i>off</i> something;
	[pro jexat ^l]	- to pass <i>by, past</i> something (by transport);
	[pe rejexat ^l]	- to move to another place (by transport), or to drive across/over something or somebody, etc.
Latvian:	[braukt]	to go (by transport);
	[at braukt]	to come <i>to</i> (by transport);
	[ai zbraukt]	to leave <i>from</i> (by transport);
	[i ebraukt]	to arrive <i>into</i> a place (by transport);
	[iz braukt]	to go <i>out of</i> a place (by transport);
	[pi ebraukt]	to drop <i>by</i> (by transport);
	[no obraukt]	to travel (distance, by transport);
	[pa :rbraukt]	to pass <i>by</i> (by transport); [pa:rbraukt pa:ri] to drive <i>over</i> sth./sb.

Grammatical gender of nouns is usually marked by noun **endings**; in Russian, masculine nouns typically end in consonants (i.e., [stol] – table, [tjas] – hour, [dom] – house, etc.), feminine – in [a] / [ja] / [t^l] (i.e., [noga] – leg, [kravatj] – bed, etc.), and neuter – in [e]/[je] or [o]/[jo] (i.e., [pol^le] – field; [mor^le] – sea, or

[uxo] – ear; [slovo] – word, etc.).¹³ Why do many inflectional languages have grammatical gender? Grammatical gender arises from the psychological and social properties of word-meanings:

Every word is a generalization – a contiguity of concept, caused by subjectively perceived resemblance between experiences, connected in collective memory. Being **acts** of thought by the collective mind of each distinct society, living, thinking, and communicating about their changing realities in different times and places, word-meanings are bound to differ in form and nuances of meaning. Each **‘social mind’** has its own ‘personality’ shaped by collective experiences (history, cultural attitudes, habits and behaviors, etc.). Viewed through the prism of diverse collective experiences, the world will be reflected differently in the collective generalizations (word-meanings) of every language community. Thus, differences are bound to develop in the way each society generalizes reality, both conceptually and structurally. Each social means of thought (language) thus developed grammatical structures which reflect the collective ‘vision’ of each society, the prevailing cultural attitudes coloring their world like tinted lenses.

Grammatical gender, for example, infuses inanimate objects with a semblance of ‘life’ which gives them an emotional overtone and reflects historical societal perceptions of reality (i.e., Russian has three grammatical genders, Latvian has two, while English, because of its history,¹⁴ has largely lost grammatical gender, typical of its Germanic relatives and many other Indo-European languages):

Russian:	[interes <i>ij</i> vopros] masc.	–	an interesting question
	[interes <i>naja</i> kniga] fem.	–	an interesting book
	[interes <i>noje</i> mesto] neut.	–	an interesting place
Latvian:	[interesanta gra:mata] fem.	–	an interesting book
	[interesants jauta:jums] masc.	–	an interesting question

Grammatical gender not only ‘colors’ inanimate objects with ‘life,’ it also determines the adjective endings (inflectional morphemes) which must agree (and decline) with the nouns they describe:

Adj. + Noun Declensions:	association	Russian for ‘little mouse’
Nominative: What? (resemblance, contiguity & cause/effect):		[malʲenʲkaja miʃka] feminine
Genitive: From/Of what? (resemblance/ contiguity)		[iz, ot][malʲenʲkoi miʃki]
Dative: To whom/what? (movement towards – contiguity)		[k][malʲenʲkoi miʃke]
Accusative: What/Who? (contiguity, cause/effect)		[malʲenʲkuju miʃku]
Instrumental: By who/with what? (contiguity, causal, resemblance)		[malʲenʲkoi miʃkoi]
Locative: In/about who/what? (contiguity in space/time)		[o, v] [malʲenʲkoi miʃke]

The isolating morphology of indigenous English words, on the other hand, makes it easy to use ‘nouns’ as adjectives (i.e., the ‘key hole,’ ‘water bottle,’ ‘kitchen knife,’ ‘wind force,’ etc.), by purely syntactic means (Adj.N. order) This is not so in inflecting languages, such as Russian or Latvian, where adjective

¹³ There are always exceptions to the rule, of course.

¹⁴ Beautifully explained by John McWhorter in his book “Our Magnificent Bastard Tongue: the untold history of English” (2009).

endings must be added to form an adjective from a noun: [kuxn¹a] – kitchen; [kuxonnij nož] – kitchen knife).

The scope of this paper does not permit a more detailed account of all the various uses of inflectional and derivational morphemes in inflectional languages. However, the few examples discussed above have already proved, I believe, that, just as the structure of water molecules affects their behavior in water, so also the physical **structure of word-meanings** affects their behavior in the language system. Morphology of word-meanings has a profound determining effect not only on the way word-meanings form the larger units of meaning (phrases, clauses and sentences), but also on their own *meaning*, thus shaping both the syntactic and semantic structures of the whole system.

V. CONCLUSION

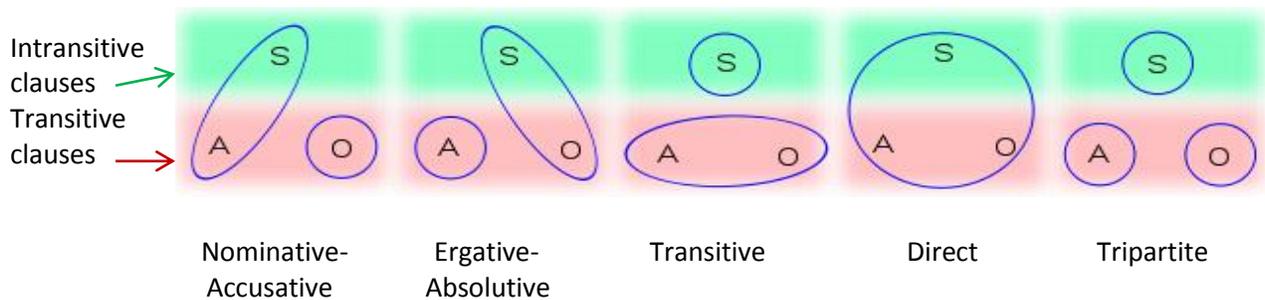
I have argued that the method of dialectical analysis is best suited to the study of complex systems, such as language, because it combines the advantages of both synthesis and analysis. By identifying the smallest functional unit of the whole, and focusing on its properties, we gain an understanding of how these units interact with each other, thus shaping the behavior of the whole system.

I have extrapolated several linguistic universals that arise from the psycho-physical and socio-historical properties of word-meanings, and then showed how the same universal properties of word-meanings also *cause* enormous linguistic diversity.

All grammatical functions and ‘devices,’ however, irrespective of language type, express the universal associations human minds make between things they perceive; they all serve to connect ideas by resemblance, contiguity in space/time, and by cause and effect. Inflectional languages use a lot of prefixes, suffixes and endings, as well as prepositions, to do the job, while analytical languages use mostly prepositions, postpositions, and a ‘fixed’ word order in the sentence to do the same:

- **NOUNS** are collective social generalizations, the **contiguity** of concept **caused** by perceived **resemblance** between instances.
- **NOUN DECLENSIONS and PREPOSITIONS** express our perceptions of how things and events relate to each other in space/time and cause/effect (association by contiguity and cause/effect):
 - **Nominative:**(What?/Who? – associations by resemblance, contiguity, cause/effect)
 - **Genitive:** (of/from what? – association by contiguity + cause/effect)
 - **Dative:** (to/towards what/whom? – association by contiguity + cause/effect)
 - **Accusative:** (what/who? – association by contiguity + cause/effect)
 - **Instrumental:** (by /with what? by /with whom?– resemblance, contiguity + cause/effect)
 - **Locative:** (Where?/When? In/at/about what/who? – contiguity in space/time)

N.B. Languages may differ in the way they align the argument of an intransitive verb (S), the agent of a transitive verb (A), and Object (O):



However, the S/V/C nexus (in whichever way they combine) and the 'bonds' word-meanings form in the flow of speech (by resemblance, contiguity in space and time, and by cause/effect) are the same in the sentences of all languages:

- **NOUNS** are the products of generalization (associations by resemblance, contiguity, and cause/effect)
- **VERBS** 'connect' with what we speak about, they say something about their subject (that is why in some inflectional languages, like Russian, verbs in the past tense also inflect according to the gender of the subject noun). The verbs of different languages 'slice' Time the way the society perceives events happening in it; **verb**
 - **tenses** express the language speakers' conceptualization of Time in relation to actions and processes they communicate about, their perceptions of contiguity between events in time (present, past, and future);
 - **aspect** specifies the kind of action (completed, continuous, etc.; associations by contiguity in Time + resemblance);
 - **voice** (contiguity + causality + resemblance): questions were asked (by investigators)
- **ADJECTIVES & ADVERBS** of **MANNER** describe things/actions/qualities (association by resemblance);
- **ADVERBS** of **PLACE/TIME** explain where and when things happen (association by contiguity)
- **ADVERBS** of **REASON, CONSEQUENCE, CONCESSION, CONDITION**, etc. establish a perceived causal relation between events (association by cause/effect).

In the diversity of linguistic structures/forms, Dialectical Analysis sees unity of practical purpose. Viewed as socially practiced ways of generalizing by living, thinking and communicating minds, abstract rules of grammar become logically comprehensible, practical expressions of the natural way human societies perceive reality.

When viewed through the lens of dialectical analysis, the diversity and richness of 'architectural styles' different societies have created to express these same basic relationships between things in the world add a new dimension to the study of linguistic typology. Dialectics opens up new horizons for comparative and descriptive analysis. Instead of describing the changing physical forms of language in

isolation, disjointed from the workings of the generalizing minds that produce them in the course of social interaction, dialectical analysis 'connects the dots,' breathing life into the ever-changing 'styles' of generalizing and speaking.

Epilogue

I would like to end with the words of David Hume, my favorite philosopher; they resonate in me:

"I am ... affrighted and confounded with that forlorn solitude, in which I am placed in my philosophy, and fancy myself some strange uncouth monster, who not being able to mingle and unite in society, has been expelled all human commerce, and left utterly abandoned and disconsolate. Fain would I run into the crowd for shelter and warmth; but cannot prevail with myself to mix with such deformity. I call upon others to join me, in order to make a company apart; but no one will hearken to me. Everyone keeps at a distance, and dreads that storm, which beats upon me from every side. I have exposed myself to the enmity of all metaphysicians, logicians, mathematicians, and even theologians; and can I wonder at the insults I must suffer? I have declared my disapprobation of their systems; and can I be surprised, if they should express a hatred of mine and of my person? When I look abroad, I foresee on every side, dispute, contradiction, anger, calumny and detraction. When I turn my eye inward, I find nothing but doubt and ignorance. All the world conspires to oppose and contradict me; though such is my weakness, that I feel all my opinions loosen and fall of themselves, when unsupported by the approbation of others. Every step I take is with hesitation, and every new reflection makes me dread an error and absurdity in my reasoning."

David Hume. (1739). *A Treatise of Human Nature*, Book I. Of the Understanding. Part IV, Section vii.

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