Dynamical Systems as a Metaphor in Linguistics: The Case of Two Connectives of Modern Greek, “ENO” and “KATHOS”

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INTRODUCTION

Language is not a random event. It exists because the world exists and "the world is all that is the case", as Wittgenstein put it. Language is the picture of reality. Language depicts the world and the world is reflected in it.

It is within this conventional earlier Wittgensteinian framework that we propose to analyze connectives at an initial stage. And this approach is adopted because we believe that whatever meanings and functions of connectives exist, or rather are current, in language usage, they all derive from a conceptual brand of meaning describable as part of a pictorial form. Extrapolating from Wittgenstein’s view that:

"Pictorial form is the possibility that things are related to one another in the same way as the elements of the picture. That is how a picture is attached to reality; it reaches right out to it. (Z.151, 2.1511)

it is reasonable to claim that connectives are those forms that are used as tools in order to relate or combine, not elements, but pictured or states of affairs, correlating them with various configurations of such states.

It is evident, then, that both the linguistic world and the natural world are intertwined in intricate ways. And this epistemological issue is very current. Indeed, Dascal (in progress) writes:

"Philosophers of science will need to follow other contemporary philosophers in examining, to a previously unprecedented depth, the manner in which language fits the world, asking how terms attach to nature, how those attachments are learned, and how they are transmitted from one generation to another by the members of a language community."

The aim of this paper is to examine at an initial stage the functions of two connectives of Modern Greek, ENO and KATHOS. We will examine their role as connectors in language and see how this is determined by configurations of states of affairs as perceived by the human mind as well as how these connectives determine our perceptual patterns. We will move
from the traditional view of prepositions and conjunctions to the meta-
theoretical view of connectors. In following this course, we are in agreement,
on the one hand, with Wittgenstein’s “The limits of my language mean the
limits of my world”, but, on the other, we follow suit on its current replace-
ment: “The limits of my perception are the limits of my world”.

Although we adopt the Wittgensteinian outlook on language as a picture of the
world, the similarity between Wittgenstein’s method and the one adopted
here stops at this point and we depart from a static model-theoretic conception
of language and its semantics. We are going to invoke a dynamic semantics
that need not contradict a model-theoretic account but rather complement it
(Wildgen 1982).

THE TWO CONNECTIVES: “ENΩ” AND “ΚΑΘΩΣ”

In traditional grammatical terms ενώ and καθώς/καθό are categorized
as conjunctions or subordinating conjunctions linking two clauses. The
former is categorized as a conjunction introducing temporal clauses as well as
concessive ones. The latter is said to introduce temporal and causal clauses
(Tzartzanos 1946, 1960).

It is worth mentioning at this stage that both these connectives, like the
majority of the connectives in Modern Greek, originate from the conjunction
of a preposition and a substantive or some other particle(s) (cf. Kittis 2000). Both
ενώ and καθώς/καθό are no exception to this rule. Indeed, conjunctions
can be treated as prepositions whose complements may be either NPs
or sentences (Radford 1981). But this is a point to which we will have to return.

Prepositions, just like conjunctions, are linked with the notion of
connection. Conjunctions or prepositions are surface manifestations of connection
(Rudolf 1988, 1996). The term “connection” refers to the process of connecting
two or more entities and to the result of this process. Enow and kathws are
categorized as-conjunctive expressions or connectors in speech whose main
function is to indicate the existence of a connective relation (Rudolph 1988).

The connection lies “between two single propositions a and b, which
express events linked to form a new complex proposition a-ref-b”. Unlike the
propositions a and b, which can be said to depict events, this new complex
proposition indicates a thought. And “a thought is a logical picture of facts”
(Wittgenstein 1921: 3). Just as “a proposition is a propositional sign in its
projective relation to the world” (Wittgenstein: 3.12), so, too, “a picture presents
a situation in logical space, the existence and non-existence of states of affairs”
(Wittgenstein: 2.11).

If there is some truth in what has been said already, we must question the
claim that the speaker of a language has a free hand in supplying the type of
connection irrespective of his/her perception of the conceptual patterns of
relationships in the sociophysical world. Such patterns may represent more
archetypal stable processes that are acquired to a certain extent universally
and may not be dependent culturally or socially.

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“ENΩ” AND “ΚΑΘΩΣ” AS TEMPORAL CONNECTIVES

Both enow and kathws are, according to Tzartzanos (1946), temporal subor-
dinate conjunctions. Since they both introduce adverbial clauses, together with
their clauses they can be called “temporal adverbs”. “Temporal adverbs (and
so temporal clauses) modify or characterize reference time, but do not
provide it. What the adverb provides is a time frame which narrows down the
possible locations of the reference time in the sense that reference time will
be found inside or range over this frame” (Haman 1989: 41). They are both
used to express concurrence, but only kathws is used to express anteriority
(Tzartzanos 1946, para 261). In the next two sections we will look at each
connective separately and present some typical examples.

Enow

We will now present some examples representative of the various func-
tions of enow:

1. Δύο ώρες αργότερα, και ενώ βρισκόταν εν αίωνες, ρέματο το παρ-
ημέρος.
“Two hours later and enow while the plane was still in the air,
the windscreen cracked”.

2. Μενεί στη θέση της (και ενώ κινείται, διαφθορά Αλίυς).
“It stays in place (*and enow while you are going about”.

3. O Karl Lowith ... χαρακτηρίζει το έργο του Comte “Μαθηματικής Ιστο-
κής Φιλοσοφίας” ως “το μεγαλύτερο αντίστοιχο της φιλοσοφίας της
ιστορίας του Hegel”, (*και) enow ρ. Aron τον ονομάζει “κοινωνια-
λόγο της ανθρώπινης και κοινωνικής ενότητας”.
“Karl Lowith ... characterizes Comte’s work ‘Lessons of positivist
philosophy’ as ‘the greatest opposite number to Hegel’s philosophy of
history’, (*και) enow ρ. Aron calls him ‘the sociologist of human
and social solidarity’”.

4. Προκήρυξαν, σε αρμόδια του 19ου αιώνα στο επίπεδο της ιστορίας
να χωρίζουν οι φυσικές επιστήμες, (*και) enow στο επίπεδο της φιλοσ-
φίας εφαρμόζοντας το ιδιωτικό και η μεταβατική ζώνη του
οίκου του ανθρώπινου λόγου.
“Indeed, at the turn of 19th century as far as epistemology is
concerned science is prevalent, (*και) enow ρ. as far as philosophy goes En-
lightenment and metaphysics set in in the form of investigation of the
boundaries of Science”.

5. Το αυτοκίνητο είπε ενώξης μεγάλες ζημίες (*και) enow κάποιον και σημα-
νικεί έγγραφα τον ΤΕΙ.
“The car suffered great damages (*και) enow ρ. important docu-
ments were burned”.

6. Οι γειτονικών της κλίμακας Eye and Ear Infirmary της Νέας Υόρκης
προσακολούθησαν συνάδελφους τους να παρακολουθούν σε πραγματικό
χρόνιο κειμενικές επιστήμες, (*και) ενω παράλληλα προσφέρουν
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7a. Ενώ πλησιάζει ο 21ος αιώνας η Ευρώπη αλλάζει μορφή.
"Eno/While the 21st century is approaching Europe is changing face".

It is true, however, that the two connectives can sometimes be interchanged when they signify temporal duration. In the following two sections we will present examples of eno as a contrastive or concessive connective and of kathos as a causal one.

"Eno" as a contrastive connective

Quite apart from eno's use as a near-coordinating atemporal connective, this subordinating conjunction can be used to denote contrast within temporality. That is to say, contrastiveness appears to be an outgrowth on temporality, just as causality seems to be an epiphenomenon, too (Kittis 1994, to appear, Kotoumi-Kittis 1996). In trying to account for this function of eno we found it useful to invoke the dynamics of dynamical systems that provide an analogue, as we will see below. Let's consider (9), which denotes both temporality and contrastiveness:

9. Ενώ ήταν χρωματισμένος, βγήκε ο Ένο.
"Eno (although/while) he had a cold, he went out".

We notice that, firstly, there is a temporal connection between the two propositions: He went out during the period of his cold. Proposition A, "He had a cold" postulates a temporal frame for proposition B, "He went out". This means that the event presented in proposition B occurred within the spatio-temporal boundaries of the event or state depicted in proposition A. Eno places the event it dominates into a four-dimensional relation in space-time, setting it as the frame of the figure action. Secondly, there is a connection of contrast: Proposition B seems to be unexpected in relation to proposition A, as it is part of our background knowledge that we do not normally expect of a person who is ill to go out. And this is what is newsworthily in (9). As Rudolph (1988) points out, when the outcome of an action, expected and generally achieved, is not given then there is a need to express this in language in a connection of contrast.

The reason why the (non)occurrence of an action is expected hinges on a matrix of presuppositions, encyclopaedic knowledge, knowledge of the world, specific knowledge of the discourse formed within the mind of the participants through their social intercourse, in short, what van Dijk (1997) would call experience models and event models. All this leads to a deep causality pattern underlying each chunk of unexpected behaviour, which exists in the subversion of expected conduct.

The two possibilities of a contrastive relation are the concessive and adversative relations. In both cases, the sequence of the sentences is the same but the position of the connective expression changes. The consequence of this change in the position of the marking is a change in meaning (Rudolph 1988). In an adversative relation, there is coordination and the marking lies in the
beginning of proposition B.

10. ἦταν ἄρροστος ἀλλὰ βρήκε ἑξώ.  

"He was sick all but he went out."

In a concessive relation the connective introduces a frame for the following material advancing the main line of the narrative. According to Ramsey (1987), a frame has the following features and it enhances the dynamics of sequencing of information.

a. It reflects an iconic order.
b. It carries main line information.
c. It is in the realis modality.
d. It shows new information in its predicate.

A frame cannot be subverted as it provides mainline information for imposing all types of relations with the figure. For example, we cannot say:

11. ἦταν βρήκε ἑξώ ἦταν ἄρροστος.  

"While he went out he was ill."

"Kathos" as a causal connective

Kathos introduces, not only temporal clauses, but, according to Tzartzanis (1946), causal clauses as well. It sounds reasonable to claim that any causal meanings are secondary and generated on the basis of temporal connections.

12. Οἱ πυροπόροι σπέρναν όμεσα καθος η φωτιά απειλούσε κατοικι- 

κοινές περιοχές.  

"The fire brigade acted instantly kathos the fire was threatening residential areas".

12a. Οἱ πυροπόροι σπέρναν όμεσα ενώ η φωτιά απειλούσε κατοικι- 

κοινές περιοχές.  

"The fire brigade acted instantly eno while the fire was threatening residential areas".

Kathos in (8) as well as in (12) denotes a spatial element as it places the figure of the event on the ground and implies a strong connection to a physical line. Whereas eno imposes an inclusive durative relation mostly when in initial position, kathos can express anteriority or simultaneity in linearity. Kathos expands from the spatial and temporal domain to imply indirect causality, as in (13): At the point at which, at the time when, and because it was raining, we got wet. Diffusion of the elements of space, time and cause is consistent with trends in physics where time, space and cause are intertwined.


"As it was raining we got soaked to the skin".

13a. Eno ἔβρεξε γίνεται μονάδα.  

"While it was raining we got soaked to the skin".

While kathos in (13) denotes both temporality but also causality (continuity, consequence), eno in (13a) can only have a temporal interpretation, but it also gravitates towards concession or contrast (discontinuity, break, in consequence), hence its reduced acceptability, since the contrast expressed or implied conflicts with stereotypical knowledge. It is interesting to note that kathos is mentioned as introducing "causal relative" adverbial clauses, too. By "relative" Tzartzanis seems to mean that these connectives can introduce factive clauses. Kathos in this use can function just like the purely causal connective ἔπειδη (because) as in (14) (cf. Kittis 1996, forthcoming):

14. Συγκομισμένοι καθός είστε από τη δυνατοτήτα μου, δεν μπορείτε να οδεύετε την προμαχώνα. (Επείδη είστε συγκομισμένοι από τη δυ- 

νατοτήτα μου).

"Moved (upset) as you are with my unhappiness (Because you are moved) you cannot see things clearly". (Tzartzanis 1989)

LANGUAGE AND DYNAMICAL SYSTEMS

Despite Wittgenstein’s proclamation that language pictures the world, in model-theoretic semantics language is self-centred and self-contained, and there is no connection between the object-world and the linguistic world mediated by human perception and conception. However, recent developments in semantics assume a continuity between the external and the internal world, and in this type of semantics psychophysical aspects of perception and cognition affect the nature of meaning. While model-theoretic accounts of meaning draw on the Aristotelian tradition as developed by Russell, Wittgenstein, Carnap, Montague and others, more recent psychophysical dynamic conceptions of meaning derive from the tradition starting with Heraclitus, who views the world as governed by dynamic principles. This latter tradition is more congenial to Peirce’s semiotics (cf. Wilgen 1981). Within this more recent trend, we would identify imaginistic models of semantics such as Lakoff’s (1977, 1987) cognitive semantics or Langacker’s (1979, 1987, 1990, 1991) cognitive grammar. The main precept in imaginistic modelling of meaning is the assumption that image-like representations underlie “linguistic meaning”, thus connecting the mono-level linear organization of language with holistic gestalts that sustain meaning. Imaginistic schemata are three-dimensional schemata, or rather occur in the context of space-time, within which they derive their interpretation. It is rather evident that this type of semantics is not static like a model-theoretic semantics, but has an inherent dynamism as it involves dynamic processes of imaginistic representations. The basic notions in such dynamical systems are time, space and motion, and topological backing is desirable inasmuch as it can provide an analogy for determining meaning in a broader context. An extended version of Thom’s (1970, 1973, 1974) topological and dynamic semantics includes a hierarchy of semantic archetypes, which are gestalt-like basic processes. These semantic archetypes act as
DISCRETE FUNCTIONS

These are functions that correlate discrete events. They are subdivided into two types: functions that express deep cause-and-effect relations and functions that merely state events that co-occur in space or time. Both these functions can be said to be borne out in the use of eno, though the former in an inverse fashion. Conflicting causalities render the system unstable. The evolution of the system becomes discontinuous then and we encounter bifurcations, which incur changes. The characteristic of these relations is that they are drastic: they imply a drastic change.

The catastrophic element in language may be perceived as a strong contrast. Contrast also implies discreteness. Eno imposes strong contrastive relations on the events it correlates. Consequently, eno may link only discrete events. The term "discrete", here, is limited to characterizing events which lack consequence in their occurrence. That is why (13) sounds odd.

Let's see how we can apply this function in language and determine the correlation it effects:

15. **ENO/Καθάρως διάδοχο, εξήγησε το τηλέφωνο.**
   "While/As I was reading, the telephone rang".

16. **ENO/Καθάρως διάδοχο, εξήγησε το τηλέφωνο με το χαρτοκούτη.**
   "While/As I was reading, I was slitting the pages with the paperknife".

17. **ENO/Καθάρως διάδοχο, το τηλέφωνο έλαβε.**
   "While/As I was reading, I was folding the pages".

18. **Πρώτος συμπέρανε ο Άλβανος σε θέματα του ΚΤΕΛ, ενώ η εργασία προσπάθησε να διαπεράσει.**
   "The Albanian was the first to be arrested on the KTEL bus, while as he was trying to run away".

19. **Ενό Δει τον οφαπόσιο, τον παντρεύτηκε.**
   "While/Although she didn’t love him, she married him".

20. **Τον παντρεύτηκε, ενό Δει τον οφαπόσιο.**
   "She married him, while/although she didn’t love him".

Here we have a system of two events that are linked temporally:
1. the event of an accident.
2. the event of an agent’s coming out of it intact.

The function correlates the physical events in time-space. This correlation is configured by the conjunction, which links propositions representing events in time.

The function correlates events which are discrete in physical terms. The two events are also discrete in conceptual terms. Nothing in the conceptual domain of car accidents implies the good luck of someone coming out of one all in one piece. In other words, eno connects in a catastrophic fashion two semantic archetypes: lack of love and marriage, car accidents and somatic integrity. That is why in eno-conjunctions we often encounter polarity items and negation.
The occurrence of the second event has a catastrophic effect in the development of the first event: a drastic change that is represented as an unfolding. When the car accident happened, the flow of events as expected before this event was disrupted. Notice the discontinuity of the line, which shows the discontinuity of events as an unfolding. This drastic change implies a rupture. The dynamics of change in our system are negative, as conceptually we move from something positive to something negative. This drastic change is what speakers intuitively perceive as contrast. This order may be reversed if we impose an evaluative assessment of the positive-negative scale.

Apart from being temporally linked, the events in the system are linked by cause-effect relations. This demonstrates the fact that surface contrast relations are deep structure cause-effect relations. There is an inherent causality (soft rationality) factor in the first event, which does not allow for the second event to occur. This points to an assumption that surface contrast relations are inverted deep structure cause-effect relations. Moreover, rationality is imaginative inasmuch as it uses a variety of imaginative schemata and the view of reason taken here is a much richer experiential view (Lakoff 1987).

Furthermore, we would classify ῥέω, but also ἱκτός, together with some other connectives, within the class of what we might call existential quantifiers (cf. Kontogiou-Katis 2001). In actual fact, these connectives as adverbs or propositions quantify over specific events which have an existential factuality. They are considered as having occurred, or as scheduled to occur, at a specific point (or interval) in time, at an allotted moment, even if this moment is in the future. In one word, they are individuated and as such they assume specificity. This argument is linked with the point made by Τζαρτζανος (1989, para 253, 1):

H ἐννεάκος μενονονά γένεις πρὸς χάτι, ποι εκεῖσι ποι μελετον στὸ ἄρητο ως πραγματικό. [Adversative is normally effected against something that the speaker regards as factual]

Moreover, both ένω and καθός do not license non-past perfective verb-forms which ordinarily refer to non-specific future (Bybee and Dahan 1989). The main characteristic of this non-occurrence is the absence in such verb-forms of specific temporal reference (indefinite time reference), which entails individuation. As Τσανγαλίδης (1999: 202) notes, definitiveness and non-pastness (even if contradictory) in such verb-forms can yield indefiniteness. We assume that it is this feature of indefiniteness that disallows the occurrence of these verb-forms in the context of the two connectives.

CONTINUOUS FUNCTIONS

Another type of function is the one used to describe continuous events. By “continuous” we mean events that are consequent in their occurrence. The function may impose cause-effect on the events it correlates, relations that are not catastrophic and do not involve a bifurcation set or line: no drastic change is implied. This function is portrayed in the use of καθός/καθά.

Ancient Greek particle ἄγω is extremely versatile both in terms of its syntactic patterns and its meaning and function: It is both an adverb and a conjunction. In its latter function, it can be temporal (= ἄγω, διάγω), causal (= ἄγω, διάγω), or it can denote purpose (= ἄγω). It can also function as a complementizer (ὅτε, κατά) (Τζαρτζανος 1960: 76).

Καθός is a preposition, and its use, as known, prepositions originated as adverbs in Ancient Greek. It denotes motion in a linear fashion, direction towards an object or (metaphorically) purpose. It is also the preposition to denote agreement relations (αναλογίζεται). So we see that their account in terms of dynamical systems finds support in the etymology of the connectives, too.

If more than one semantic archetype are correlated with καθός/καθά, then they are represented as a thematic continuity on a connected graph (1) and in such a correlation there is often one attractor (nominal particles, for example, the agent of a process or an experiencer) as can be the case in thematic continuity (cf. examples of καθός 6, 13, 14). On the other hand, ένω/καθά configures propositions as a thematic discontinuity on a disconnected graph (2) (example 21, but also 15) (Wildgen 1994).

Graph 1: “Καθός” configuration

Graph 2: “Ένω” configuration

It becomes evident that the use of ένω will prompt a reading of the clause expressing a contrast or an interruption, even when the background expectations do not orient towards a contrastive interpretation, whereas καθός promotes a consequent and/or parallel interpretation of the two events presented...
in the conjunction. While καθος is an indicator of symmetry and consequent forces, eno is one of asymmetry and antagonistic forces. The consequent force of the event represented in the main clause has its source in the event of the καθος-clause. Its starting point touches the terminal point of the καθος-event or it runs parallel to it. Narrative structure has been represented as imagistic syntax of texts demonstrating the kinematics of the effect of forces with different sources in dynamic domains. Wildgen (1994) employs cellular automata (Toffoli 1984) in narrative analysis.

CONCLUSION

We correlated events in dynamical systems and speech events, as there is a direct relation between speech and reality, language and the universe. In examining conjunctions we viewed them as invoking a dynamical metaphor. This perspective views language as a transfer of energy in universe or as an imprint of dynamical systems, and in this case the same principles can be applied in both domains. Indeed, we might think of language in terms of event dynamics and each linguistic item as vibrating energy.

Eno/evò and καθος/καθαός are connectives involving prepositions in modern Greek as is proven by their etymological patterns. Evò is formed by preposition εν and anaphor -ος, whereas καθος by the prepositions καθ' and ας. So their syntactic function, rather than being that of a conjunction, as they are typically categorized in grammatical terms, may be that of a preposition, especially they quantify over time.

The etymological patterns of both prepositions have direct implications on the spatial element expressed by them. Evò expresses containment in time and diffusion in space, whereas καθος expresses a direct line in physical terms, parallelism, as well as clear connection of cause. The spatial element still combine time, space and cause.

The temporal function of the two prepositions is the same as they both present a temporal frame. This is expressed in the sentence structure, where he part dominated by the preposition is always preposed and acquires the dominant features of a frame: i.e., it is in the “realis modality”, it carries mainline information”, it carries “new information in its predicate”, and it affects an “iconic order” and it helps the “dynamics of the sequencing of information” (Raggey 1987: 406).

The semantic expansions of the two prepositions are discrete on surface. Eno has a contrastive function analogous to a bifurcation set in dynamical systems, whereas καθος has a causal function. The distinct functions of the καθος prepositions have direct implications on the nature of domains they specify. Evò presupposes distinct domains, whereas καθος presupposes on continuous domains. Evò and καθος rely on cause as surface contrastive patterns are based on deep causality patterns. This may lead us to conclude that time, space and cause are intertwined in language. These attributes and functions of the two connectives apply to their extreme polar ends since, as we have seen, there is a continuity of function between them uniting them at their temporal durative function.

How can one compromise what has been said about the chaotic function of evò with its parallel developed function as a mere coordinating conjunction? That is, as a conjunction of mere perception and cognitive inertia? One might again resort to a transient escape to the general trend in epistemology to detect at the heart of complex configurations the phenomenon of self-organization. Phenomena that occur within complex systems tend to “self-regulate” under certain circumstances. If chaotic ruptures tend to decline or “break down” to order, then it is perhaps not too unreasonable to witness lexical items that at some point of their evolution signal chaotic ruptures to later also acquire an “orderly” function, thus compromising major chaotic discrepancies.

If chaotic behaviour is portrayed analogically non-linearly in dynamical systems, order is depicted in linearity that reflects organization, additivity and parallelism. “Parallelism”, as Attardo writes, “can be defined as a law of inertia, i.e., the tendency to continue in the same ‘frame’, be it semantic, syntactical, or pragmatic once one has been activated” (1997: 401). Eno/Evò may be said to reflect a multiple shift, originally from parallelism and containment to expulsion and rupture of order and, much later, from disorder and exclusion to parallelism, linearity and order. In these three identifiable functions, evò, as a configurator of represented states and actions, can be claimed to reflect spatiality and temporality, antithesis, and currently to have developed conjunctive functions which can in effect be concurrence with the others. This latter function is, however, also isolatable from the others, as evò is currently also used to signal mere conjunctivity (Koutoulis-Kitsi 1999).

Merging language and space (topology) leads us to a meta-physical level of understanding and description of the function of linguistic items and of the world. If one were to inquire about the adequacy of the metaphor and the analogy proposed here in relation to any particular occurrence of these connectives, we would answer pace Wittgenstein, when he wrote about the adequacy of a Newtonian theory of the world:

We ought not to forget that any description of the world by means of mechanics will be of the completely general kind. For example, it will never mention particular point-masses: it will only talk about any point-masses whatsoever.

(1961 [1921]: 6.3432)

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NOTES

1. These are the first-occurring translations in dictionaries, but as white and as can at times be interchanged so can their Greek translational equivalents.
2. Aspect and situation type verbs are decisive factors in the creation of frames, but this point needs research.

3. Of course, there are examples such as (1) το αποκτητήρι τον θεοσφαίριστο κοσμό θα ζητήσει στον ευθεία παραθυρόφυτο τον πλανήτη μας ("This discovery is considered very significant as it will assist us in explaining phenomena of our planet"). In which καθές appears to have a posterior function. However, it is noticeable that καθές in (1) introduces an epistemic clause which should actually be: "καθές we know that it will assist us etc." and the main is an evaluation dependent on the proposition of the subordinate clause.

4. Interestingly, its translational equivalent in English, while, is acceptable as it is mostly a temporal connective rather than a contrastive one as is the case with eno.

5. Cognitive grammar was originally called "space grammar" as workers in the field use multidimensional pictorial representations for grammatical analysis.

6. The term "archetype" derives from Plato (cf. Wildgen 1981). René Thom, the French mathematician, introduced catastrophe theory in 1966 but this theory has its roots in such fields as topology and dynamical system theory. He also presented an initial little developed theory of catastrophe semiotics. Catastrophe theory has applications to real life phenomena and in diverse fields such as, sociological, psychological, and cartography (see Zeeman 1977).

7. Fillmore, as far as we know, was the first linguist to relinquish a traditional symbolic account of language and propose a theory of language and its semantics as part of a global theory of mind.

8. It is interesting to note that the English translational equivalent of eno, while, is more restricted in its potential for indicating contrast and concession and states much more strongly than eno towards a temporal interpretation.

9. An unfolding in catastrophe theory is an evolution around the center of a dynamic system after its stabilization.

10. For example, in lexical semiotics a zero-unfolding would characterize locational concepts of being, resting, or of possession such as owning or having. Its formal characteristics yields stable existence as its interpretation (Wildgen 1981).

WORKS CITED


