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

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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.
(2.151, 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 pictures of 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, *ενώ/eno* (*while*) and *καθώς/kaθos* (*as*).¹ 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 replacement: "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: "ΕΝΩ" AND "ΚΑΘΩΣ"

In traditional grammarian terms *ενώ/eno* and *καθώς/kathos* 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 (Tzartanos 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. Kitis 2000). Both *ενώ/eno* and *καθώς/kathos* 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. *Ενώ* and *καθώς* are categorized as connective 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-rel-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.

"ΕΝΩ" AND "ΚΑΘΩΣ" AS TEMPORAL CONNECTIVES

Both *ενώ* and *καθώς* are, according to Tzartanos (1946), temporal subordinate 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 *καθώς* is used to express anteriority (Tzartanos 1946, para 261). In the next two sections we will look at each connective separately and present some typical examples.

Ενώ

We will now present some examples representative of the various functions of *eno*:

1. *Δύο ώρες αργότερα, και ενώ βρισκόταν εν πτήσει, ράγισε το παράθυρο.*
"Two hours later and eno/while the plane was still in the air, the windshield cracked".
2. *Μένει στη θέση της (και) ενώ κινείσθε. (διαφήμιση Always)*
"It stays in place (*and) eno/while you are going about".
3. *Ο Karl Lowith ... χαρακτηρίζει το έργο του Comte "Μαθήματα θετικής Φιλοσοφίας" ως "το μεγάλο αντίστοιχο της φιλοσοφίας της ιστορίας του Hegel", (*και) ενώ ο R. Aron τον ονομάζει "κοινωνιολόγο της ανθρώπινης και κοινωνικής ενότητας".*
"Karl Lowith ... characterizes Comte's work 'Lessons of positivistic philosophy' as 'the greatest opposite number to Hegel's philosophy of history', (*and) eno/while R. Aron calls him 'the sociologist of human and social solidarity'".
4. *Πράγματι, στις αρχές του 19ου αιώνα στο επίπεδο της επιστήμης κυριαρχούν οι φυσικές επιστήμες, (*και) ενώ στο επίπεδο της φιλοσοφίας εδραϊώνονται ο Διαφωτισμός και η μεταφυσική ως έρευνα των ορίων του ανθρώπινου Λόγου.*
"Indeed, at the turn of 19th century as far as episteme is concerned science is prevalent, (*and) eno/while as far as philosophy goes Enlightenment and metaphysics set in in the form of investigation of the boundaries of Reason".
5. *Το αυτοκίνητο έπαθε μεγάλες ζημιές (*και) ενώ κάηκαν και σημαντικά έγγραφα των ΤΕΙ.*
"The car suffered great damages (*and) eno/while important documents were burned".
6. *Οι γιατροί της κλινικής Eye and Ear Infirmary της Νέας Υόρκης προσκαλούν συναδέλφους τους να παρακολουθούν σε πραγματικό χρόνο χειρουργικές επεμβάσεις, (*και) ενώ παράλληλα προσφέρουν*

τις υπηρεσίες τους σε ασθενείς μέσω τηλεκάμερας.

"The doctors of the Eye and Ear Infirmary of New York invite their colleagues to attend operations in real time, (*and) *eno/while* concurrently they offer their services to patients via a video-camera system".

It is noticeable that although all these uses of the connective *ενώ* can be called temporal, there is variability in the type of temporality in some of them. In (1) the *eno*-clause specifies the temporal frame within which the event represented in the proposition of the main is contained. The relation between the two is very tight and can be depicted as in figure 1:

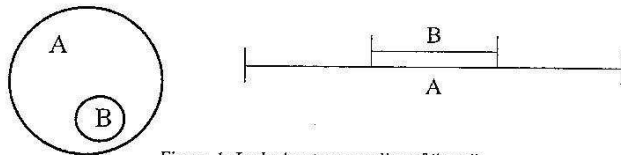


Figure 1: Inclusive temporality of "eno"

However, in examples (3) to (6) *eno* can be quite acceptably replaced by the coordinating conjunction *και* (*and*) without any significant loss of meaning. Whereas in (1) and (2) the coordinating conjunction *and* can co-occur with *eno*, as we can see (in (2) though "and" is an emphasizing particle with the meaning of "even"), this is not possible in examples (3) to (6). This shows us that *eno* does not act as a temporal connective and its function is very close to that of a coordinator rather than a subordinator. In (6), specifically, we can notice the adverb *παράλληλα* (=concurrently) emphasizing the coordinating function of the connective. This near-coordinating function of the subordinator *eno* is not mentioned in Tzartanos and we will bypass it in this study (but see Koutoupi-Kitis 1999, to appear).

It needs to be pointed out that in (3) to (6) the co-occurrence of *and* with *eno* is possible if the clause is fronted, but then *eno* acquires a temporal meaning of inclusion and possibly of contrast. We now turn to *καθώς*.

Καθώς

We present typical examples of *καθώς* in its function as a temporal connective before we review both connectives in their non-temporal functions:

7. *Καθώς πλησιάζει ο 21ος αιώνας η Ευρώπη αλλάζει μορφή.*
"Καθώς/As the 21st century is approaching Europe is changing face".
8. *Καθώς καθάριζα τα κρεμμύδια, έκοψα το δάχτυλό μου.*
"Καθώς/As I was peeling the onions, I cut my finger".

Καθώς and *eno* can sometimes be interchanged in their temporal (and probably causal) meaning, but *eno* gravitates towards concession or contrastiveness as in (7a), while the additional causal meaning of *καθώς* may be absent (12a, 13b below):

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 *καθώς* as a causal one.

"Ενώ" 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, contrastingness appears to be an outgrowth on temporality, just as causality seems to be an epiphenomenon, too (Kitis 1994, to appear, Koutoupi-Kitis 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 contrastingness:

9. *Ενώ ήταν κρυωμένος, βγήκε έξω.*

"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" posits 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 by 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 newsworthy 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. *Ήταν άρρωστος αλλά βγήκε έξω.*
 "He was sick ala/but he went out".

In a concessive relation the connective introduces a frame for the following material advancing the main line of the narrative.² According to Ramsey (1987), a frame has the following features and it enhances the dynamics of sequencing of information.

- It reflects an iconic order.
- It carries main line information.
- It is in the realis modality.
- 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. *?Ενώ βγήκε έξω ήταν άρρωστος.*
 "?Eno/while he went out he was ill".

"Καθώς" as a causal connective

Καθώς introduces, not only temporal clauses, but, according to Tzartanos (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. *Οι πυροσβέστες επενέβησαν άμεσα καθώς η φωτιά απειλούσε κατοικημένες περιοχές.*
 "The fire brigade acted instantly *καθως/as* the fire was threatening residential areas".
- 12a. *Οι πυροσβέστες επενέβησαν άμεσα ενώ η φωτιά απειλούσε κατοικημένες περιοχές.*
 "The fire brigade acted instantly *eno/while* the fire was threatening residential areas".

Καθως 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, *καθως* can express anteriority or simultaneity in linearity.³ *Καθως* 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.

13. *Καθώς έβρεχε γίναμε μούσκεμα.*
 "As it was raining we got soaked to the skin".
- 13a. *?Ενώ έβρεχε γίναμε μούσκεμα.*
 "While it was raining we got soaked to the skin".

While *καθως* 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, inconsequence), hence its reduced acceptability, since the contrast expressed or implied conflicts with stereotypical knowledge.⁴ It is interesting to note that *καθως* is mentioned as introducing "causal relative" adverbial clauses, too. By "relative" Tzartanos seems to mean that these connectives can introduce factive clauses. *Καθως* in this use can function just like the purely causal connective *επειδή* (*because*) as in (14) (cf. Kitis 1996, forthcoming):

14. *Συγκινημένος καθώς είστε από τη δυστυχία μου, δεν μπορείτε να ιδείτε την πραγματικότητα. (Επειδή είστε συγκινημένος από τη δυστυχία μου).*
 "Moved (upset) as you are with my unhappiness (Because you are moved) you cannot see things clearly". (Tzartanos 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. Wildgen 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.⁵ 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.⁶ These semantic archetypes act as

organizational schemata and reflect cognitive scenarios for dynamic phenomena (Fillmore 1977, Wildgen 1982, 1987).⁷ As can be seen, there is a certain variation as to which specific model one adopts in explaining linguistic phenomena within a dynamic framework, but the one adopted here will be a topological one as in catastrophe semantics.

After this short introduction to the approach adopted here, let us now turn to a consideration of the two connectives within this dynamic frame. Prepositions and/or conjunctions are connectives in language that correlate speech events into various configurations. A similar pattern of correlation of events in time is rendered in terms of functions. For the purposes of this paper we chose to invoke two types of function: those which refer to **discrete**, and those which refer to **continuous** events. The former provide an analogue for the function of *eno* while the latter provide an analogue for that of *kaθos*.

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. *Ενώ/Καθώς διάβαζα, χτύπησε το τηλέφωνο.*
"While/As I was reading, the telephone rang".
16. *Ενώ/Καθώς διάβαζα, έκοβα τις σελίδες με το χαρτοκόπτη.*
"While/As I was reading, I was slitting the pages with the paperknife".
17. *Ενώ/Καθώς διάβαζα, τσάκισα τις σελίδες.*
"While/As I was reading, I was folding the pages".
18. *Πρώτος συνελήφθη ο Αλβανός σε λεωφορείο του ΚΤΕΛ, ενώ/καθώς προσπαθούσε να διαφύγει.*
"The Albanian was the first to be arrested on a KTEL bus, while/as he was trying to run away".
19. *Ενώ δεν τον αγαπούσε, τον παντρεύτηκε.*
"?While/Although she didn't love him, she married him".
20. *Τον παντρεύτηκε, ενώ δεν τον αγαπούσε.*
"She married him, ?while/although she didn't love him".

21. *Ενώ το αυτοκίνητο έγινε συντρίμια, η Έρη βγήκε αλώβητη απ' το δυστύχημα.*
"?While/Although the car was completely smashed, Eri came out of the accident in one piece".⁸

While in (15) we witness two distinct unrelated events, both connectives denote a temporal duration that is interrupted, although *eno* gravitates towards a contrastive interpretation, as well. In both (16) and (17) there is minimal discreteness of events to warrant a contrastive reading of *eno*, as slitting or folding pages may be understood as consequent (as default-like variation) within the activity of reading, hence the interpretation of *eno* is acceptable only as a purely temporal durative connective. A temporal durative interpretation is also derived from *eno* in (18). In all these cases the two connectives are almost interchangeable, with *eno* gravitating towards a contrastive interpretation. However, examples (19) to (20), in which temporality is attenuated inasmuch as it is not a determinant of the eventuality (states rather than events), demonstrate that the two connectives are not interchangeable when the two eventualities represented in the propositions are considered totally discrete, discontinuous and unparallel. In (19) and (20), we notice that the initial or final position of the *eno*-clause is inconsequential for its interpretation, as in both cases the default knowledge that marriage is consequential on love is stable. The same can be said about (21). The pre-posed or post-posed *eno*-clause will represent a rupture and discontinuity in the ordered sequence of events: <car-accidents>injury/death>. What both sentences represent is a rupture, or discontinuity and in-consequence, in the expected event-sequence. This function of *eno* is diagrammed as follows:



Figure 2: The analogical function of contrastive "eno"

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.⁹ When the car accident happened the flow of sequential 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-and-effect relations. This demonstrates the fact that surface contrast relations are deep structure cause-and-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-and-effect relations. Moreover, rationality is imaginative inasmuch as it uses a variety of imagistic schemata and the view of reason taken here is a much richer experiential view (Lakoff 1987).

Furthermore, we would classify *ενώ*, but also *καθώς*, together with some other connectives, within the class of what we might call *existential quantifiers* (cf. Koutoupi-Kitis 2001). In actual fact, these connectives as adverbs or prepositions 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 Tzartzanos (1989, para 253, 1):

Η εναντίωσις κανονικά γίνεται προς κάτι, που εκείνος που μιλεί το δέχεται ως **πραγματικό**. [Adversativity is normally effected against something that the speaker regards as **factual**]

Moreover, both *eno* and *kaθos* do not license non-past perfective verb-forms which ordinarily refer to non-specific future (Bybee and Dahl 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 Tsangalidis (1999: 202) notes, perfectivity 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-and-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 *kaθos/as*. *Kaθos*, therefore, configures representations of events that entail no accidents or change, and this corresponds to a zero-unfolding that implies stability and existence with minor deformations.¹⁰

This function of *kaθos* is also correlated with its etymological make-up: *καθώς* originally was *καθά*

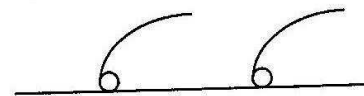
κατά>κατά ά>καθά
κατά ώς>καθώς

Particle *ως* was initially a deictic adverb meaning *thus*. This deictic meaning is prevalent in Homer and is preserved in the Attic dialect in the expressions *καί ως* (= and thus), *οὐδ' ως* (= not thus) *οὐδ' ως ώργίζετο* H.

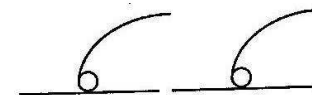
Ancient Greek particle *ως* is extremely versatile both in terms of its syntactic patterns and its meaning and function: It is both an adverb and a conjunction. In its latter function it can be temporal (= *δτε, άφού*), causal (= *διότι*), or it can denote purpose (= *ώστε*). It can also function as a complementizer (*δτι, πως*) (Tzartzanos 1960: 76).

Kατά is a preposition, and as is 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 (*καθωσπρέπει*). So we see that their account in terms of dynamical systems finds support in the etymology of the conjunctions, too.

If more than one semantic archetype are correlated with *kaθos/as*, then they are represented as a thematic continuity on a connected graph (1) and in such a correlation there is often one attractor (nominal participants, for example, the agent of a process or an experiencer) as can be the case in thematic continuity (cf. examples of *kaθos* 8, 13, 14). On the other hand, *eno/while* configures propositions as a thematic discontinuity on a disconnected graph (2) (example 21, but also 15) (Wildgen 1994):



Graph 1: "Kaθos" configuration



Graph 2: "Eno" configuration

It becomes evident that the use of *eno* will prompt a reading of the clause expressing a contrast or an interruption, even when the background expectancies do not orient towards a contrastive interpretation, whereas *kaθos* promotes a consequent and/or parallel interpretation of the two events presented

in the conjunction. While *kaθos* 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 *kaθos*-clause. Its starting point touches the terminal point of the *kaθos*-event or it runs parallel to it. Narrative structure has been represented as imaginistic 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/Evō and *kaθos/kaθōs* are connectives involving prepositions in Modern Greek as is proven by their etymological patterns. *Evō* is formed by preposition *ev* and anaphor *-ō*, whereas *kaθōs* by the prepositions *κατά* and *ος*. 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, specially as they quantify over their propositions.

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

The temporal function of the two prepositions is the same as they both represent a temporal frame. This is expressed in the sentence structure, where the 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 reflects an "iconic order" and it helps the "dynamics of the sequencing of information" (Ramsey 1987: 406).

The semantic expansions of the two propositions are discrete on surface. *Evō* has a contrastive function analogical to a bifurcation set in dynamical systems, whereas *kaθōs* has a causal function. The distinct functions of the two prepositions have direct implications on the nature of domains they specify. *Evō* presupposes distinct domains, whereas *kaθōs* presupposes continuous domains. *Evō* and *kaθōs* 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 *evō* 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 for a transient exegesis 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 signalled 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/Evō* 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, *evō*, 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 concurrent with the others. This latter function is, however, also isolatable from the others, as *evō* is currently also used to signal mere conjunctivity (Koutoupi-Kitis 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 *while* 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 (i) *Η ανακάλυψη αυτή θεωρείται πολύ σημαντική καθώς θα βοηθήσει στην απάντηση φαινομένων του πλανήτη μας* ("This discovery is considered very significant as it will assist us in explaining phenomena of our planet"), in which *kathos* appears to have a posterior function. However, it is noticeable that *kathos* in (i) introduces an epistemic clause which should actually be: "*kathos* 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 1968 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 semantics. Catastrophe theory has applications to real life phenomena and in diverse fields such as sociology, behavioural sciences (psychology) and linguistics (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 gravitates 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 semantics a zero-unfolding would characterize localistic concepts of being, resting, or of possession such as owning or having. Its formal-characteristic yields stable existence as its interpretation (Wildgen 1981).

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