# Polysynthetic Tendencies in Modern Greek[*]

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## Abstract

The aim of this paper is to provide a more accurate typological classification of Modern Greek. The verb in MG shows many polysynthetic traits, such as noun and adverb incorporation into the verbal complex, a large inventory of bound morphemes, pronominal marking of objects, many potential slots before the verbal head, nonconfigurational syntax, etc. On the basis of these traits, MG has similarities with polysynthetic languages such as Abkhaz, Cayuga, Chukchi, Mohawk, Nahuatl, a.o. I will show that the abundance of similar patterns between MG and polysynthesis point to the evolution of a new system away from the traditional dependent-marking strategy and simple synthesis towards head-marking and polysynthesis. Finally, I will point to the risk of undertaking a direct comparison of different language systems by discussing the pronominal head-marking strategies in MG and the North American languages.

## 1      Language types and the index of synthesis

I would like first to present the main typological classes usually acknowledged in the literature and the current position of MG within this system. As a basis of argumentation, a version of the morphological classification of languages by Philippaki-Warburton (1992: 79–82) will be used.

The morphological differences that are found in languages classify them into two large categories: *isolating* ("analytic" in Philippaki-Warburton's terms) and *synthetic* languages. In isolating languages, the vast majority of words consist of free morphemes. That means that in these languages each morpheme constitutes a separate word, and for this reason the distinction between morphemes and words is not valid. Chinese and Vietnamese are typical examples of this language type. (1) is an example from Vietnamese, taken from Comrie (1981).

(1)      *Khi tôi đên nhà ban tôi, chung tôi băt đâu làm bài.*
         when I come house friend I PLURAL I begin do lesson
         'When I came to my friend's house, we began to do lessons.'                 (Comrie 1981: 40)

In (1) there are no bound morphemes. Every word is an *invariable* free morpheme.

In synthetic languages, words consist of more than one morpheme. Synthetic languages are subdivided into *agglutinating* and *fusional* ("inflectional" in Philippaki-Warburton's terms).[1]

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[1] Comrie (1981) notes that "both agglutinating and fusional languages, as opposed to isolating languages, have inflections, and it is therefore misleading to use a term based on *(in)flection* to refer to one only of these two types. The availability of the alternative term fusional neatly solves the terminological dilemma" (see Comrie 1981: 42).

Agglutinating languages have two characteristic traits: (a) one can easily discern the morphemes that participate in the word form. In other words, the morphological structure of the words is transparent and immediately accessible, and (b) the relation between form (= morpheme) and meaning is one to one.

A representative agglutinating language is Turkish, as becomes apparent from (2) and (3):

(2)    Morphemes
       (i)       /ev/              'house'
       (ii)      /ler/             'plural'
       (iii)     /i/               'possessive pronoun, third person singular'
       (iv)      /den/             'from'                              (Philippaki-Warburton 1992: 80)

(3)    Words
       (i)       /evler/           'the houses'
       (ii)      /evi/             'his/her house'
       (iii)     /evleri/          'his/her houses'
       (iv)      /evden/           'from the house'
       (v)       /evlerden/        'from the houses'
       (vi)      /evinden/         'from his/her house'
       (vii)     /evlerinden/      'from his/her houses'               (Philippaki-Warburton 1992: 80)

On the other hand, in fusional languages (a) the division of a word into morphemes is problematic, and (b) the relation between the elements of form and elements of meaning is indirect and complex, as in the case of some polymorphemic words in MG. For example, the verbal ending *-es* in *éghrapses* 'you wrote' encodes 2$^{nd}$ person and singular and past, the verbal suffix *-tik* in *ghráftike* 'it was written' encodes past and nonactive and perfective, and the nominal ending *-us* in *anthrópus* encodes accusative and masculine and plural (these examples are taken from Joseph 2002ª: 5f.).[2]

In (4) there is an overview of the typological classification by Philippaki-Warburton:

(4)    A. Isolating ("analytic")        B. Synthetic
       -Chinese, Vietnamese-            (i) Agglutinating              -Turkish-
                                        (ii) Fusional ("inflectional")  -MG-

The classes *A* and *B* in (4) are differentiated on the basis of the number-of-morphemes-per-word whereby the subdivision of *B* into *Agglutinating* and *Fusional* is based on the criterion of the ease-of-segmentation of the word. However, these two criteria do not always operate independently. There is a kind of languages called "polysynthetic," in which each sentence usually consists of only *one word* which can have agglutinative and/or fusional traits. For example, the polysynthetic languages Chukchi and Eskimo can be regarded as agglutinative with a certain amount of fusion (cf. Comrie 1981: 42f.). It is obvious that the division in (4) is not adequate because it asymmetrically applies the criterion of the number-of-morphemes-per-word which *definitely* operates in the *A*-class.

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[2] In MG the verb is inflected for mood (indicative, subjunctive, imperative), aspect (perfective, imperfective), voice (active, passive), tense (present, past), person (1$^{st}$, 2$^{nd}$, 3$^{rd}$), and number (singular, plural). The future is expressed by a particle *tha* followed by the present or dependent (the verb-form distinction *present*/*dependent* relies on the account of Holton et. al. (1997); it is not used in this paper because it impedes the comparison of MG with the polysynthesic languages under examination). There is also an indeclinable active gerund in *-ondas,* an active and passive present participle, and a past passive perfect one in *-ménos* (*kurasménos* 'tired'). Formally, the finite forms of the verb (those with personal endings) consist of a stem + (optionally) the perfective aspect maker (*-s-* in active, *-th-* in passive) + personal ending (indicating person, number, tense, mood, voice). Past forms are usually prefixed by *e-* (the "augment"). In the active 1st conjugation, the present endings are *-o, -is, -i, -ume, -ete, -un*, and the past endings are *-a, -es, -e, -ame, -ate, -an*. There is also a 2$^{nd}$ conjugation with two types (for further details cf. Holton et al. 1997).

In line with Comrie's suggestions, two parameters have to be asserted, i.e. the "index of synthesis" (number of morphemes per word) and the "index of fusion" (ease of segmentation of the word). The index of synthesis has the two extremes *isolating* and *polysynthetic* and the index of fusion has the two extremes *agglutination* (with straightforward segmentability) and *fusion* (with no segmentability). "What are traditionally called polysynthetic languages become languages with a high index of synthesis... The traditional class of agglutinating languages corresponds to those with a low index of fusion... the traditional class of fusional languages corresponds to those with a high index of fusion..." (cf. Comrie 1981: 43). In (5) I give an overview of Comrie's classification.

(5)    Isolating        <-------------- Index of synthesis --------------> Polysynthetic
                                 (number of morphemes)

       Agglutinating    <---------------- Index of fusion ----------------> Fusional
                                  (ease of segmentation)

Following these suggestions, we have to abandon Joseph's (2002[a]) assumption that the Greek verb is not polysynthetic because individual endings do not encode "several different grammatical categories all at once" in an "extensive degree" (cf. Joseph 2002[a]: 5f.). In line with Comrie's argumentation, the attested patterns refer to a moderate "index of fusion" without excluding MG from polysynthesis. In other words, one can decide this issue only on the basis of the number of morphemes per word, i.e. on the basis of the "index of synthesis." The question which immediately arises is what is *word* in MG, an issue pursued in the next section.

## 2    Word in Modern Greek – Slot Patterns

The verb form in polysynthetic languages may be organized (i) in a *templatic* way or (ii) by *scope ordering* and that independently of affixal or compositional polysynthesis (see section 6). Greenlandic is an example of a language of the type (ii) in which different orderings of suffixes yield different meanings (cf. Mattissen 2003: 286f. and the examples therein). In organization type (i) there are several slots or "positions" before or after a verb root but not every slot need be filled in a single verb form, cf. Abkhaz, Navaho, Cayuga, etc.

In Cayuga, a Northern Iroquoian language spoken in Ontario, eight major parts of the verb form can be distinguished. From left to right, these parts are (1) the prepronominal prefixes, (2) the pronominal prefixes, (3) the reflexive/semireflexive, (4) the incorporated noun root, (5) the verb root, (6) the derivational suffixes, (7) the aspect suffixes, and (8) the so-called extensions (cf. Table 1, taken from Sasse 1999: 81).

| CAYUGA VERB FORM | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | ASPECT STEM | | | | | |
| | | BASE | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Pre-pronominal Prefixes | Pro-nominal Prefixes | Reflexive and Semi-reflexive | Incorpo-rated Noun Root | **Verb Root** | Derivational Suffixes | Aspect Suffixes | Extensions |

**Table 1**

The base of the verb form is constituted by positions (3) through (6). The addition of an aspect suffix (position 7) yields the aspect stem. As Sasse (1998) argues, "everything having to do with the lexical meaning of the verb is in the base."

In MG we get similar patterns, whereby the main difference is that position 4 can be occupied by an adverb or a noun (verb forms with both an incorporated adverb and a noun, such as

*sixno-kraso-píno³* 'often'-'wine'-'drink' are not grammatical). Table 2 shows how the Greek verb form is organized in Indicative and Subjunctive. NEG stands for the prepronominal negation marker *dhen,* CON for the prepronominal contrastive (negation) marker *mi(n),* FUT for the prepronominal future marker *tha,* MOD for the prepronominal modal marker *na,* $PM_1$ and $PM_2$ for the pronominal markers ('object pronouns' or 'weak pronominals'),[4] VR for the verb root, DS for possible derivation suffixes, AS for the aspect suffix, AGR for agreement.

| GREEK VERB FORM | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) | NEG | FUT | $PM_{1(goal)}$ | $PM_{2(theme)}$ | ADV/N | VR | DS | AS | $AGR_{(subject)}$ | (INDICATIVE) |
| (b) | MOD | CON | $PM_{1(goal)}$ | $PM_{2(theme)}$ | ADV/N | VR | DS | AS | $AGR_{(subject)}$ | (SUBJUNCTIVE) |

**Table 2**

(6a) and (6b) exemplify the patterns in (a) and (b) of Table 2, respectively.

(6)    a.  *dhen-tha-tu-to-ksana-dhó-s-i*
        NEG-FUT-$PM_1$-$PM_2$-ADV-VR-AS-AGR
        not-will-to.him-it-again-give-PERF-3SG
        'He will not give it to him again.'

      b.  *na-min-tu-to-ksana-dhó-s-i*
        MOD-CON-$PM_1$-$PM_2$-ADV-VR-AS-AGR
        should-not-to.him-it-again-give-PERF-3SG
        'He should not give it to him again.'

Some remarks on the slot patterns in Table 2: the preverbal elements in various contexts are optional (cf. section 7), the verb base being VR-(DS)-AS. In IND and SUBJ, the prenominal marker in genitive (goal[5]) appears first, and the pronominal marker in accusative (theme) appears second.

One cannot have both a referential object marker and a referential incorporated noun root as theme. Sentences such as (7) are ungrammatical (i is the coreference index).

(7)    *\*ta-xarto-pézi*
       them$_i$-cards$_i$-he.plays
       'He plays cards.'

The same is also true for Mohawk, a Northern Iroquoian language spoken in United States and Canada (cf. Baker 1996: 22). In this case the object agreement morpheme must be lost, cf. the grammatical (8a) with the ungrammatical (8b).[6]

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[3] The usual citation form for the Greek verb is the 1st person singular.

[4] A list of the 'object pronouns' or 'weak pronominals' can be found in Joseph (2002ᵃ: 3).

[5] Marginally, the pronominal marker in genitive expresses the beneficiary role, cf. (i)

  (i)    *Mu-éftiakse*        *to*        *aftokínito.*
       for.me-he.repaired        the        car
       'He repaired the car for me.'

[6] Baker (1996) names this type of incorporation "robust." Accordingly, noun incorporation in a specific language is robust if (a) it is reasonably productive, (b) the noun root is fully integrated with the verb morphologically, (c) the noun is referentially active in the discourse, and (d) both the noun root and the verb root can, in general, be used independently (cf. Baker 1996: 19).

(8)    Mohawk
       a.  *Ra-wir-a-núhwe'-s*
           MsS-baby-∅-like-HAB
           'He likes the baby.'

       b.  **Shako-wir-a-núhwe'-s*
           MsS/FsO$_i$-baby$_i$-∅-like-HAB                    (Adapted from Baker 1996: 22)

FUT and MOD are in complementary distribution in MG and define the position and form of the negation particle, which in (b) of Table 2 is named CON (=*mi(n)*) [7], cf. a similar pattern in Cayuga, whereby the CONTRASTIVE prefix *thi-/thẽ-/tha'-/tha:-* "regularly occurs as a substitute for the NEGATIVE prefix in combination with the modal prefixes where the NEGATIVE prefix is not allowed to occur" (cf. Sasse 1999: 83f.).

In pattern (b) of Table 2, the hortative prefix *as-* can appear instead of *na-*, expressing advice/exhortation, cf. (9).

(9)    *as-min-tu-to-ksana-dhó-s-i*
       HORT-CON-PM$_1$-PM$_2$-ADV-VR-AS-AGR
       let-not-to.him-it-again-give-PERF-3SG
       'He should not give it to him again.'

Another monosyllabic element that may appear before *na-* (cf. 1b) is *ghia-* 'to', 'so as to', 'so that', etc. expressing purpose, cf. (10).

(10)   *ghia-na-min-tu-to-ksana-dhó-s-i*
       PURP-MOD-CON-PM$_1$-PM$_2$-ADV-VR-AS-AGR
       so.that-should-not-to.him-it-again-give-PERF-3SG
       'So that he won't give it to him again.'

I am inclined to consider *ghia-* as a pre-pronominal prefix. In Cayuga, there is a group of affixes known as the DISLOCATIVE (DIS) suffix group which always occur in the suffix position 6, meaning 'go to do something,' e.g. *-atawẽ-* 'swim': *-atawẽ-hne/a* 'go there to swim' (cf. Sasse 1999: 90), i.e. with a fixed position in a slot pattern as in the case of the MG *ghia-*. We must thus extend the subjunctive pattern in (b) of Table 2 with the two patterns in Table 3.

| GREEK VERB FORM | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) | HORT | | CON | PM$_{1(goal)}$ | PM$_{2(theme)}$ | ADV/N | VR | DS | AS | AGR$_{(subject)}$ | (SUBJ) |
| (b) | PURP | MOD | CON | PM$_{1(goal)}$ | PM$_{2(theme)}$ | ADV/N | VR | DS | AS | AGR$_{(subject)}$ | (SUBJ) |

**Table 3**

Joseph has argued in an number of works (cf. Joseph 1990, 2002$^a$, 2002$^b$) for the benefits of a morphological classification in relation to clitics and other little elements or "particles" that tend to cluster in front of (or sometimes behind) a verbal head, esp. the modal markers *na, as,* the future (and modality) marker *tha,* the negation markers *dhe(n)* and *mi(n)*, and the elements that mark argument structure ('object pronouns' or 'weak pronominals').

In his view, an affixal analysis of these elements is considerably favoured, cf. for example *dhen* which cannot be an independent word, is unable to occur as an one-word answer, i.e. it has an idiosyncratic behaviour which is characteristic of affixes. *Dhen* occurs only with indicative finite verbs, but not subjunctive finite verbs or nonfinite verbs (cf. examples in Joseph 1990: 174–176). It also shows semantic idiosyncrasy, e.g. in the expression *dhen mu*

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[7] As Joseph (2000$^b$) notes, *mi(n)* cannot be used as a general non-indicative negator since imperatival forms cannot be negated per se but only their "surrogate" prohibitives. These always contain a finite verb form, cf. *mí(n) fíghis* 'don't leave.' For further arguments about the special status of *mi(n)* see Joseph (2000$^b$: 107 Fn. 5).

*lés* 'tell me...', in which it does not have its usual negative value (evidence for a nonsyntactic, noncompositional treatment of this element). In a similar way, the 'object pronouns' cannot occur as one-word answers and are strictly ordered with respect to the other preverbal elements (cf. Tables 2 and 3). Other criteria which advocate an affixal analysis of these pronominal markers are their high selectivity of combination, since in general they occur only with a verb, and the gaps in their combination, a phenomenon which is assumed to be typical of affixes, cf. (11) with the illegal order 1p-2p-verb.[8]

(11)    *\*mu        se          dhósane*
        to.me       you         they.gave
        'They gave you to me.'                            (adapted from Joseph 1990: 177)

The morphophonological idiosyncrasies in the combination of these little elements also advocates an affixal analysis. For instance, when a weak pronoun in 3SG.ACC follows a weak pronoun in 2SG.GEN, the final *-u* of the first pronoun is deleted, as (12) exemplifies. This process does not fall in the domain of the general phonological rules in MG (cf. Joseph 1990, 2002[a] and 2000[b] for details).

(12)    *su-to-édhose* → *sto édhose*
        to.you-it-he.gave
        'He gave it to you.'

Morphophonogical idiosyncrasies are very usual in polysynthetic languages, where affixal markers appear before a verbal head, i.e. within a word. For example, in Cree, an Algonquian language spoken in Canada, the pronominal markers *ni-* and *ki-* (cf. section 4.4) show idiosyncrasies such as the insertion of *-t-* before most vowel-initial stems, a phenomenon which (i) does not take place with the full forms of these reduced elements and (ii) does not comply with the general rules of Cree phonology (cf. Joseph 2002[b]: 95 – further details and examples are given in (g) of section 3).

In this section I have shown that the verb form in MG has many polymorphemic patterns (patterns with a high index of synthesis according to Comrie 1981) with two features often appearing in polysynthetic languages: (a) slot patterns (b) morphological idiosyncrasies in the combination of morphological elements. But is MG a polysynthetic language? Section 3 deals with a general description of polysynthetic languages by Michael Fortescue and offers many corresponding examples from polysynthesis and MG.

## 3        Polysynthetic traits in Modern Greek

Fortescue (1994: 2601) mentions a number of "traits that tend to cluster in languages displaying polysynthetic morphology." He also says that none of these traits are criterial on their own. In the following, I will cite these traits (in italics) while keeping Fortescue's numbering. Each trait is accompanied with some characteristic examples from polysynthetic languages and MG.

*(a) Noun stem incorporation within the verbal complex (also of adjectival stems within nouns).*

**Polysynthesis:** Noun incorporation (NI) is the compounding of a nominal stem with a verb, in order to construct a complex verb. In Cayuga, for example, the nominal root *-ahy-* 'berry' is

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[8] Joseph (2000[b]) adopts the position made by Zwicky (1994: xiii) that the notion of clitic is not a genuine category in grammatical theory and can be rejected as unnecessary. According to this position, the binary division of the elements of grammar in *affixes* and *words* assigns these elements to morphology or syntax, respectively, and is indispensable. Clitics are thus considered as atypical affixes (for further details see Joseph 2000[b]: 89–91). For a syntactic approach see Philippaki-Warburton/Spyropoulos (1999), who consider pronominal clitics as phonologically dependent *words*.

compounded with a verbal root *-kw-* to form the verb stem *-ahyakw-*, which then can be used as a base for verbs like *ka'hya:kwas* 'I am berrypicking' (cf. Mithun 1994: 5024; see also sections 5 and 5.1).

**MG:** A pattern of NI[9] in MG is found in (13a). The non-incorporated pattern in (13b) has exactly the same meaning. Details about NI in MG and its limited productivity are found in section 5.1.

(13)   a.   *Kobo-dhéni.*
            knot-he.ties
            'He ties knots.'

       b.   *Dhéni kóbus.*
            he.ties knots
            'He ties knots.'

*(b) A large inventory of bound morphemes (suffixes or prefixes) hand in hand with a somewhat limited stock of independent stems.*

**Polysynthesis:** In (14) from Greenlandic Eskimo, traditionally regarded as the polysynthetic language par excellence (cf. Sasse undated: 4), the whole sequence is considered as a verb form, with aliikku being the only root in the verb complex whereas all other morphemes are suffixes (= li is an enclitic), i.e. non-root bound morphemes or the final inflectional suffix (cf. Mattissen 2003: 282).

(14)   Greenlandic
       *aliikku-sirsu-i-llamma-ssua-a-nirar-ta-ssa-galuar-paal=li*
       entertainment-provide-AP-one_good_at-big-be-say-HAB-FUT-but-IND:3p>3s=but
       'However, they will say that he is a great entertainer, but...'

                                                              (Fortescue 1983, in Mattissen 2003: 282)

**MG:** In MG there is also a large inventory of bound morphemes, cf. the prefixes *kata-* 'completely', *para-* 'excessively', *kse-* 'completely', 'very much', etc., *afto-* 'self', *alilo-* 'each other', TAM and inflectional suffixes, together with a limited stock of independent stems, cf. especially foreign loans like *tést* 'test' and *asansér* 'elevator' (see also section 6).

*(c) Derivational (word-formation) processes productive in the formation of individual sentences, the verbal word being a minimal sentence (this can include shifts back and forth from nominal to verbal and the reverse within a single such word).*

**Polysynthesis:** Eskimo languages have an immense potential for linear concatenation of affixes with "concrete meanings" as Sasse (undated: 4) reports. (15) is a classical example adopted from Finck (1909).

(15)   "Greenlandic"
       a.   *aalisar-po-q*
            fish(verb stem)-IND-3SG
            'he is fishing'

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[9] In this paper, I use the term 'incorporation' barring strict syntactic considerations which rely only on compositional patterns (cf. Baker 1996 a.o.). As we will see in sections 5.1 and 5.2, MG and polysynthesis exhibit both non-lexicalized (compositional) and lexicalized (non-compositional) patterns, whereby syntactic theory cannot give a homogenous account. Accordingly, a compounding/affixal analysis seems more adequate and is adopted here.

b.  *aalisa-ut*
    fish-INSTR.N
    'fishing-instrument, fishing-line'

c.  *aalisa-ut-issiaq*
    fish-INSTR.N-SUITABLE
    'something suited for a fishing-line'

d.  *aalisa-ut-issiar-si-vu-nga*
    fish-INSTR.N-SUITABLE-GET-IND-1SG
    'I'm getting something suited for a fishing-line'

e.  *aalisa-ut-issiar-si-niar-pu-nga*
    fish-INSTR.N-SUITABLE-GET-TRY-IND-1SG
    'I'm trying to get something suited for a fishing-line'
                                   (Finck 1961: 32, adapted by Sasse, in Sasse undated: 3)

In the following I cite Sasse's description of the derivation patterns in (15): "The noun of instrument *aalisaut* 'fishing-line' in (15b) is a nominalization derived from the verbal stem *aalisar-* 'to fish' (15a). From *aalisaut* a second derived noun, *aalisa-ut-issiaq* 'something suited for a fishing line' (15c) can be formed by means of the suffix *-issiaq-*. This, in turn, enters a verbalization process by adding the verbalizing suffix *-si-* 'get' (15d). The whole complex is further extended by *-niar-* 'try,' which gives us 'try to get something...' and finally bound by the tense and pronominal suffixes which make the word-form complete (15e)." (Sasse undated: 4)

**MG:** Productive derivational patterns such as these in (15) are not attested in MG. The derivation process can take place at most twice, e.g. changing a noun or an adjective to a verb and again a verb to a noun, see (16).[10]

(16)    N           V           N
        *kub-í*      *kub-ón-o*   *kúbo-m-a*
        'button'     'button'     'buttoning'

*(d) Pronominal marking of subjects and objects or other core actants on verbal forms (so-called 'polypersonalism') and of possessors on nominal forms.*

**Polysynthesis:** Abkhaz, a North Caucasian language, is a typical example of polyperso-nalism. See, for example, (17) where the elements ∅, ɭə, and y mark the core actants on the verb stem *te-yt'*.

(17)    Abkhaz
        *a-xàc'a*        *a-pħ°ə̀s*       *a-š°q°ə̀*         *∅-lə̀-y-te-yt'.*
        the-man$_i$     the-woman$_k$   the-book$_j$     it$_j$-to.her$_k$-he$_i$-gave-FINITE
        'The man gave the woman the book.'                (Hewitt 1979, in Nichols 1986: 108)

(18) and (19) – again from Abkhaz – exemplify the pronominal marking of possessors on nominal forms. In (18) the element *sə-* marks the nominal form *y°nə* and in (18) the element *yə* marks the nominal form *y°nə̀*.

(18)    *sarà*       *sə-y°nə*        'my house'
        I/me         my-house

(19)    *à-č'k°'ən*   *yə-y°nə̀*        'the boy's house'
        the-boy       his-housè                        (Hewitt 1979: 116, in Nichols 1986: 609)

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[10] Cf. Alexiadou (to appear) for details of this process.

**MG:** In the extended verbal words in (20), the pronominal markers *tu-* and *to-,* and the inflectional ending *-i* mark the core actants on the verbal head *p-* (see also section 2). Pronominal marking of possessors on nominal forms is not attested in MG.

(20)  *na-mín-tu-to-ksana-p-í*
      MOD-CON-to.him:GEN-it:ACC-again-say:PERF-3SG
      'He should not say it to him again.'

*(e) Integration of locational, instrumental, and other adverbial elements into the verbal complex as affixes (including auxiliary-like pre- or postverbs).*

**Polysynthesis:** As Mithun (1988: 44) reports, Maidu, a language of north-eastern California, has fifteen verbal suffixes which indicate the direction of motion. They supply such meanings as 'downward, to the end,' 'separation, off from,' 'against, up to, alongside of,' 'upward,' 'down, on ground,' 'away, away from,' 'down into a hole, into a house, into a box,' etc. See some examples in (21).

(21)  Maidu
      *ha's-**mit**-asi*              'I slid **into** a hole'
      *has-**si'p**-asi*             'I slid **out** (of the house)'
      *la'p-**sito**-dom*            'crawling **through** (a hole in the fence)'
      *la'p-**tso**-no-ye-dom*       'crawling **around** something'
                                     (Dixon 1911: 700f., in Mithun 1988: 450)

The same author quotes some examples from Lakhota, a Siouan language of South Dakota. The prefixes in (22), do not refer directly to specific instruments but rather indicate types of motion.

(22)  Lakhota
      **ya***ksá*         'bite off'
      **na***ksá*         'break with the feet'
      **yu***ksá*         'break with the hands'
      **wa***ksá*         'cut with a saw'
      **ka***ksá*         'cut with an axe, break off'          (Stanley Redbird, p.c. in Mithun 1988: 448)

**MG:** MG adverbials can appear as prefixes in strict order before the head verb, see for example the position of the adverb *ksaná* in (23). The phenomenon of *adverb incorporation* (AI) in MG is discussed in detail in section 5.2.

(23)  *dhen-tha-tu-to-ksana-p-í*
      NEG-FUT-to.him:GEN-it:ACC-again-say:PERF-3SG
      'He will not say it to him again.'

*(f) Many potential 'slots,' relatively few of them obligatory, fillable with specific (semantic) types of morpheme.*

**Polysynthesis:** This trait is already discussed in section 2. See Table 1 for Cayuga.

**MG:** Similarly, this trait is attested in MG and is already discussed in section 2. See Tables 2 and 3 for an overview of the slot patterns. In (24) there is one more example: the valence operator afto- 'self' strictly appears between the incorporated adverb and the verb base.

(24)  *sixno-afto-dhiafimízete*
      often-self-he.advertises:NONACT
      'He often advertises himself.'

*(g) Productive morphophonemic processes resulting in several allomorphs (phonological shapes) for both lexical stems and bound morphemes.*

**Polysynthesis:** We have already seen an example from Cree in section 2. Cayuga is a more prominent case: eight sets of pronominal prefixes are distinguished according to the initial

sound of the verb base, e.g. for the combination 1S/2S one gets the allomorphs gõC- (C set), gõya- (a set), gõyẽ- (ẽ set), gõ- (i set), gõyõ- (õ set), gõyo- (o set). In the third person singular feminine the i of i-initial bases is swallowed by the feminine prefix e-. Thus we get the forms e-gá:nya's 'she is paying (it)' from a consonantal base and *e-dá:gra's* 'she keeps falling' from an i-initial base (cf. Sasse 1998).

**MG:** Some examples are already given in section 2. Two special cases involving the sonority hierarchy are given in (25) and (26).

(25)  *mu-édhose → múdhose*
       to.me-he.gave
       'He gave to me.'

(26)  su-to-édhose → stódhose
       to.you-it-he.gave
       'He gave it to you.'

In (25), from the two vocals *u* and *e* survives the first one, which is higher in the sonority hierarchy (sonority hierarchy for MG: *a>o>u>e>i*), and the accent stays on the vocal which survives. In (26) *su-* looses *u* in front of the clitic (or in other instances in front of the definite article with the same form) and then a second rule *o – e → o* gives the complex its final form with the stress on the vocal which survives.

*(h) Nonconfigurational syntax (relatively free word order).*

**Polysynthesis:** In a nonconfigurational language, meaning is not (or not largely) determined by word order. As Baker (1996: 10) reports, in a simple transitive sentence of Mohawk the subject, verb, and object can appear in any of the six logically possible orders.[11] See (26).

(27)  Mohawk

   a.  *Sak ra-núhwe's       ako-[a]tyá'tawi.*
       Sak MsS-like-HAB    FsP-dress
       'Sak likes her dress.'

   b.  *Ra-núhwe'-s  Sak ako-[a]tyá'tawi.*
       like            Sak her-dress

   c.  *Sak ako-[a]tyá'tawi   ra-núhwe'-s.*
       Sak her-dress           like

   d.  *Ra-núhwe'-s  ako-[a]tyá'tawi ne*[12]   *Sak.*
       like            her-dress           NE      Sak

   e.  *Ako-[a]tyá'tawi     ra-núhwe'-s     ne     Sak.*
       her-dress            like               NE     Sak

   f.  *Ako-[a]tyá'tawi     Sak ra-núhwe'-s.*
       her-dress            Sak like                                    (Baker 1996: 10)

**MG:** In MG there is a relatively free word-order in some discourse contexts, cf. the word orders SVO and VSO in (28b) associated with approx. the same meaning.

(28)  a.  *Ti       sinévi?*
           what   it.happened
           'What happened?'

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[11] Baker (1996: 10) implies that discourse ("pragmatic") factors influence word order in Mohawk but he does not go into detail.

[12] As Baker (1996: 137: f.26) notes "what *ne* is remains somewhat mysterious; its core synchronic use seems to be simply to mark a postverbal NP constituent under certain conditions. However, there is a significant amount of variation in its use both within and across speakers".

    b. *I María kérdhise éna aftokínito*. (SVO)  /  *Kérdhise i María éna aftokínito*. (VSO)
      the María she.won a car                she.won the María a car
      'María won a car.'                     'María won a car.'

*(i) Head- (or double-) marking type of inflection (cf. Nichols 1986).*

**Polysynthesis:** In most polysynthetic languages, syntactic relations are marked on the head of a constituent, cf. the pronominal markers in (17) from Abkhaz above.

**MG:** The agreement marker on the verb is an obligatory and prominent head-marking element. The relevant phenomenon is discussed in section 4 in detail.

Table 4 summarizes the discussion so far in relation to MG. 1, 2, 3, and 4 are values given for "pervasive", "non-pervasive but recurrent", "marginal", and "not attested", respectively.

| Polysynthetic Traits in Modern Greek | | | | | | | |
|---|---|---|---|---|---|---|---|
| (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) |
| NI | bound morphemes | derivation renders sentence | pronominal marking on verbs and nomina | adverbials as verb affixes | allomorphs for both lexical stems and bound morphemes | nonconfi-gurational syntax | head-marking of inflection |
| 3 | 1 | 4 | 4 | 2 | 2 | 2 | 2 |

**Table 4: 1 – Pervasive; 2 – Non-pervasive but recurrent; 3 – Marginal; 4 – Not attested.**

As shown in Table 4, the only pervasive trait is the existence of a large inventory of bound morphemes. Adverbials as verb affixes, allomorphs for both lexical stems and bound morphemes, nonconfigurational syntax, and the head-marking inflection are non-pervasive but recurrent. NI is marginal. The rendering of sentences by means of derivation and the pronominal marking on verbs *and* nomina are not attested. According to this table, there are apparent *tendencies* towards polysynthesis in MG.

In the next section, I will focus on Nichol's (1986) typological account and her insights as regards the head-marking patterns cross-linguistically. These patterns suggest a strong connection of MG to polysynthesis. On top of this, I will mention some diachronic issues related to the evolution of head-marking elements in polysynthesis and MG.

## 4      Head-marking and dependent-marking grammar (Nichols 1986)

### 4.1      Head-marking and dependent-marking

According to Nichols (1986), in the area of languages which are rather morphologically oriented,[13] two types can be assessed: the 'head-marking languages' and the 'dependent-marking languages.' In the following, I cite her main description of the phenomenon:

> "[...] syntactic relations can be morphologically marked either on the head[14] of a constituent, or on the dependent. Exx. 1–2 are a minimal pair in this respect. Both are noun phrases with possessed noun heads and possessor dependent nouns. Here [...], heads are indicated by superscript H, affixal markers by M:
> (1) English         *the man-*^M*'s*    ^H*house*
> (2) Hungarian    *az ember*      ^H*ház-*^M*a*
> In 1, the possessive construction is marked by the genitive case on the dependent noun *man*. In 2, it is marked by a pronominal suffix on the head noun *ház* 'house'. The SYNTACTIC

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[13] Nichols (1986) does not examine languages of the isolating type.

[14] According to Nichols (1986: 57), "the head is the word which governs, or is subcategorized for – or otherwise determines the possibility of occurrence of – the other word. It determines the category of its phrase."

> RELATION is one and the same – possessor noun dependent on possessed noun – but the principles for marking that relation morphologically are diametrically opposed."

(Nichols 1986: 56f.)

MG, like most Indo-European languages, is mainly *dependent-marked*. The dependent-marking patterns appear in case marking, in the construction of the possessive NP, in the attributive phrase (agreement in adjectives), in clause relations, relativization and other subordination (cf. Nichols 1986: 59–64 for the description of these phenomena; see also Charitonidis 1999).

The *head-marking* patterns relate MG to polysynthesis. In the latter, the head-marking material is usually concentrated before a verbal head. The corresponding Greek patterns appear esp. in the verbal agreement and the pronominal marking of actants (the so-called 'clitics') before the verb root. See a dependent marking pattern in (29) and its corresponding head-marking pattern in (30).

(29)    Dependent Marking
      $^{H}$*édhos-*$^{M}$*a*        *t-*$^{M}$*o*        *vivlí-*$^{M}$*o*        *st-*$^{M}$*o*        *Ghiórg-*$^{M}$*o*
      gave-1SG       the-ACC       book-ACC       to.the-ACC       Ghiórgos-ACC
      'I gave the book to Ghiórgos.'

(30)    Head Marking
      $^{M}$*tu-*$^{M}$*to-*$^{H}$*édhos-*$^{M}$*a*
      to.him:GEN-it:ACC-gave-1SG
      'I gave it to him.'

In line with Nichols's suggestions, *voice* in MG can be regarded as a head-marking element of an indirect type because it carries information about the verb's valence – although it does not directly mark the occurrence of particular nominals filling the valence in the clause (cf. Nichols 1986: 64). See (31).

(31)    *Xteníz-ete*.
      comb-nonactive.3SG
      He/she combs herself.

## 4.2     Patterns which favour head-marking cross-linguistically

Patterns which *favour* head-marking cross-linguistically and in MG (cf. Nichols 1986: 77–79) are (a) person and number agreement on verbal heads, (b) the negation, which is associated with the head of the constituent rather than with the dependent in its scope, cf. (31) from MG in which the negation *dhen* has floated away from the NP *óla ta mejéthi* toward the verb in clause level, and (c) the semantically based hierarchy of adverbials, cf. (33) – section 5.2 on AI gives a general pattern for this hierarchy.

(32)    $^{M}$*Dhén*     $^{H}$*íne*         $^{M}$*óla*     *ta*     *meghéthi*       *diathésima.*
      NEG       they.are     all     the     sizes         available
      'All sizes are not available.'

(33)    MOST LIKELY                   LEAST LIKELY
      Governed > Subcategorized > Inner adverbials > Outer adverbials[15]      (Nichols 1986: 78)

VO languages of all types (SVO, VSO, VOS) are among languages with head-marking tendencies. MG is a VO-language (according to Nichols's categorization; cf. 1986: 79–83) and is expected to have these tendencies. On the other hand, the nonconfigurational patterns and the great freedom of choice as to word order in MG (cf. (h) of section 3) is opposed to

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[15] In MG a governed adverbial is *ksaná* 'again' and an outer adverbial is *akómi* 'still.' See also section 5 on AI.

non-head-marking languages which "tend to be confined to the verb-final type" (cf. Nichols 1986: 104).

## 4.3      The appositive nature of dependents in polysynthesis and Modern Greek

In polysynthesis, when nominal dependents appear together with pronominal markers on the verbal head, the role of the dependents is *appositive,* cf. (17) from Abkhaz, repeated below as (34). The nominal dependents 'man,' 'woman,' and 'book' are in apposition to the coreferential pronominal markers on the verb.

(34)   Abkhaz

   *a-xàc'a*          *a-pħ°ə̀s*          *a-š°q°'ə̀*          *∅-lə̀-y-te-yt'*
   the-man$_i$          the-woman$_k$      the-book$_j$          it$_j$-to.her$_k$-he$_i$-gave-FINITE
   'The man gave the woman the book.'                    (Hewitt 1979, in Nichols 1986: 108)

In languages with consistent head-marking such as Abkhaz, "full NP's are included only for emphasis, focus, disambiguation, etc.' (Nichols 1986: 107). Similar patterns are attested in MG, in which the pronominal markers on the verb have the same reference as the external nominal phrases, which are included in the sentence usually for emphasis or disambiguation, cf. (35). It is noteworthy that Greek pronominal clitics are grammaticalizing definiteness as in head-marking languages.

(35)   *(o Ghiánis)*      *tu-to-édhos-e*          *tu*      *Ghiórgu*          *to vivlío*
   (the Ghiánis)$_i$      to.him$_k$-it$_j$-gave-3SG$_i$      to.him   Ghiórgos$_k$          the book$_j$
   'Ghiánis gave Ghiórgos the book.'

The head-marked dependency is *unilateral,* in that the dependent requires the head but the head does not require the dependent; the head can occur alone with the same reference (cf. Nichols 1986: 108). This actually happens in (34) and (35) from Abkhaz and MG, respectively, in which the verb constitutes a minimal sentence together with the pronominal markers. The inflectional agreement suffix on the Greek verb suggests another unilateral relation, i.e. in sentences such as (36) the subject is optional, i.e. it can be absent in some situational contexts (see section 7).

(36)   *I*      *María*   *tró-i.*
   the         María$_i$   eat-s$_i$.
   'María eats.'

Head-marked patterns such as that in (36) are also attested in many Indo-European languages, cf. English, German, a.o.

## 4.4      Headword migration and cliticization

In both Romance languages and MG, direct and indirect objects alternate or co-occur with clitics on verbs. As mentioned in section 4.3, the pronominal "clitics" before the Greek verb can be regarded as verbal markers (= affixes), in co-reference with case-marked nominal dependents. A related cross-linguistic phenomenon is the combined appearance of *headword migration* and *reduction* of whole words to affixes via cliticization. In a diachronic view, these reduced elements are derived from former dependent NPs having migrated, as it were, towards a verbal head as affixes (cf. Nichols 1986: 72). Joseph (2002[b]) reports that parallels between the independent pronouns and the weak pronouns are attested in many languages. In MG there are parallel forms such as *aftón/ton* (3SG.ACC), *eména/me* (1SG.ACC), etc. In the Algonquian (polysynthetic) language Cree, the free pronouns *ni:ya* 'I' and *ki:ya* 'you' are similar to the reduced forms (= prefixes) *ni-* and *ki-,* that mark first and second person, respectively (cf. Joseph 2002[b]: 95).

## 4.5 Conclusion

Although mainly a dependent-marking language, MG contains many head-marking patterns. Person/number and agreement markers on the verbal head, voice and negation are the most prominent. The semantically based hierarchy of adverbials and VO-order favor head-marking patterns in both polysynthesis and MG. In both polysynthesis and MG, when nominal dependents appear together with pronominal markers on the verbal head, the role of the dependents is appositive. In both polysynthesis and MG, the pronominal markers are derived from former dependent NPs. I conclude that head-marking is synchronically and diachronically motivated in both polysynthesis and MG and that this fact brings MG closer to polysynthesis.

## 5 Incorporation

Before I proceed to further evidence which supports a polysynthetic view of the Greek verb, I would like to define the notion of *incorporation*. As Mithun (1994) argues, this notion is traditionally used with a specific meaning, referring to *noun incorporation* (NI), i.e. the compounding of a nominal stem with a verb, in order to construct a complex verb (see (a) of section 3).

In the literature, we usually find a more general account of "incorporation," which, except of the traditional definition of NI above, includes the incorporation of adverbials/adverbs, verb roots, nouns with adverbial function, adjectives, sentence adverbials, etc. (cf. Spencer 1995: 455–459 for examples from Chukchi).

Furthermore, as Mithun (1994) notes, the notion of "incorporation" is sometimes used extensively to cover various types of morphologization, whereby markers appear in the verb complex, which correlate to independent words in the same language or other languages. These can be pronominal affixes, verb affixes, etc. which modify grammatical relations (cf. Mithun 1994: 5025 and see note 8).

In this paper, I use the term 'incorporation' in the last two broad senses. The incorporation of pronominal prefixes and other elements into the verbal complex inside slot patterns has been discussed in section 2. In the following, I will proceed with the presentation of the two main incorporation patterns in MG, i.e. (a) NI (see section 5.1) and (b) AI (see section 5.2). At the same time, relevant examples from several polysynthetic languages will be presented.

## 5.1 Noun Incorporation

In a language like Cayuga, the main type of incorporation is the *productive* NI, esp. the incorporation of an object (theme) into the verbal complex. In (a) of section 3 I have discussed this phenomenon on the example of the verb stem *-ahy-a-kw-* 'berry picking.' In that case, the element *-a-* is the so-called *stem-joiner* (SJ). As Sasse (1999: 85) notes "it does not have any meaning in and of itself but simply serves in tying the two roots together." This type of incorporation is very common and yields compounds from almost any verb, e.g. the root *-kw-* can serve as the base of verbs such as *-hnyõhs-a-kw-* 'pick squash/pumkins', *-yẽt-a-kw-* 'get wood,' etc. (see Sasse ditto).

Another type of incorporation in Cayuga is the *lexicalized* incorporation which yields NR+VR compounds in a specific sense, e.g. 'mind+drop' + REPETITIVE = 'forget,' 'cold + enter' + BENEFACTIVE = 'get a cold or flu,' 'throat + dry' = 'be thirsty,' etc. (cf. Sasse 1999: 88).

In the literature it is sometimes discussed whether there is productive NI in MG or not (see esp. Rivero 1992 and Smirniotopoulos/Joseph 1998). The issue is whether NI is a product of

syntactic rules, i.e. compositional/ad hoc incorporation, or a product of lexical rules, i.e. a process which yields idiosyncratic items in relation to their source.

I would like first to proceed with some data from NI. The relevant patterns show compositional and non-compositional semantics, see (37) and (38), respectively.

(37)　NI with compositional semantics
　　　*emo-ftíno* 'spit blood'
　　　*kraso-píno* 'drink wine'
　　　*lafo-kinighó* 'hunt deer'
　　　*xarto-pézo* 'gamble' (literally: 'play cards')　　　　　　(Smirniotopoulos/Joseph 1998: 472)

(38)　NI with non-compositional semantics
　　　*aero-kopanízo* 'talk nonsense' (literally: 'beat the air')
　　　*ghaidharo-dhéno* 'be sure,' 'be positive' (literally: 'tie donkey')
　　　*psomo-zitó* 'be a beggar' (literally: 'ask for bread')
　　　*psomo-trógho* 'be poor' (literally: 'eat bread')　　　　　(Smirniotopoulos/Joseph 1998: 472)

The main indication pleading for a non-compositional/lexical analysis of the formations in (37) and (38) altogether is the union vowel *-o-*, which is recognized as the 'union' vowel in Greek compounds (cf. the SJ *-a-* in Cayuga above). Spur-of-the-moment creations such as *ghato-vlépo* 'look at cats,' 'be a cat-looker,' *pito-trógho* 'eat pittas,' 'be a pitta-eater,' and *rodho-kiló* 'roll-tires,' 'be a tire-roller' confirm the existence of a productive object-verb or NI pattern with an active and intransitive verb. However, the acceptability of these formations is extremely restricted. There is thus good reason to believe that NI in MG is a lexical, non-compositional, i.e. non-syntactic process (cf. Smirniotopoulos/Joseph 1998).[16]

Summarizing, NI in Cayuga and MG can be regarded as a compounding process sharing many similarities such as compositional and/or non-compositional semantics, morphological processes like the addition of union vowels, and slot patterns, in this case the appearance of a NR just before the VR.

Another kind of incorporation in polysynthesis is the incorporation of a NR with *instrument* role, see (39) from Mohawk with the incorporated noun root *hióhs* 'elbow' denoting a body part.[17]

(39)　Mohawk
　　　*Wa'tekheiathióhsaienhte'.*
　　　wa'-te-khei-at-hiohs-a-ien-ht-'
　　　FAC-DUPL-1.SG/F.SG-elbow-SJ-hit-INSTR.APPL-PERF
　　　'I hit her with my elbow' = 'I elbowed her.'　　　　　　　　　　　　(Mithun 2004)

Similar patterns are found in MG, cf. the verb *podh-o-pató* 'tread on sb/sth,' consisting of the verb base *pató* 'tread' and the incorporated noun *pódhi* 'foot' which denotes a body part having the instrument role.

## 5.2　Adverb Incorporation

AI is not a unique characteristic but only an indication of polysynthesis, cf. Cayuga which shows no AI (cf. Sasse 1999).

As Spencer (1995) notes, it is difficult to find incorporation of temporal or aspectual adverbials in a given language. For example, in Chukchi, a palaeosiberian polysynthetic language, words like *jep* 'still' and temporal adverbs like *igər* 'today' and *ajwe* 'yesterday' fail

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[16] In this paper, syntax and syntactic theory are meant in relation to the American generative tradition (cf. the syntactic framework in Chomsky 1981).

[17] Sasse (1999: 88) reports similar incorporation patterns in Cayuga.

to incorporate. The results of incorporation usually appear as semantic units, (esp. prototypical predicates consisting of verb + object) and any sequence combination which is difficult to interpret as such a unit, e.g. a verb together with a sentence adverb, is rare and may even be ungrammatical in a given language (cf. Spencer 1995: 461). In line with this insight, perfective markers and aspectuals fail to incorporate both in polysynthetic languages and MG.[18]

Let us now look at the regular AI patterns in polysynthesis and MG. In Nahuatl, a polysynthetic Uto-Aztecan language from Central Mexico, *manner* adverbs and *directionals* are productive incorporators, cf. (40b) and (41), respectively.

(40)   Nahuatl
    a.   *As    teki-ti           K^wALI*
        Not   work-VR      well
        'He does not work well.'                          (Rivero 1992: 302)

    b.   *Ki-K^wAL-tlali*
        It-well-put
        'He fixes it (= puts it well)'        (Beller/Beller 1979, in Rivero 1992: 302)

(41)   *Ki-ČIN-K^wepa*
    It-bottom-return
    'He turns it bottom side up.'         (Sischo 1979, in Rivero 1992: 302)

In (40b) and (41), an adverb appears before the verbal root and after the object marker *Ki*, a slot pattern very similar to the Greek one, in which incorporated adverbs appear before the verb root and after incorporated pronominal objects (see section 2). Two examples from MG with an incorporated manner adverbial (see (42)) and a directional (see (43)) exhibit the same patterning as the Nahuatl examples above.

(42)   *Dhen-tha-tu-to-ksana-p-í.*
    NEG-FUT-to.him-it-again-say:PERF-3SG
    'He will not say it to him again.'

(43)   *I    María     tha-to-anapodho-girís-i*
    the   Mary     FUT-it-upside.down-turn:PERF-3SG
    'Mary will turn it upside down.'        (Adapted from Rivero 1992: 289)

In (44), I cite some examples with manner incorporators from MG.

(44)   Manner adverbs
    a.   *arghá* 'slowly'           a'.   *argh-o-masó*[19] 'chew slowly'
    b.   *dhískola* 'hard'         b'.   *dhiskol-o-jenó* 'give birth with difficulty'
    c.   *ghorghá* 'fast'           c'.   *ghorgh-o-petó* 'fly fast'
    d.   *kaká* 'badly'             d'.   *kak-o-loghó* 'talk badly'
    e.   *kalá* 'well'              e'.   *kal-o-vlépo* 'see well'
    f.   *krifá* 'secretly'         f'.   *krif-o-gheló* 'chuckle'
    g.   *psilá* 'lightly'           g'.   *psil-o-zalízome* 'feel slightly dizzy'
    h.   *sfixtá* 'tightly'          h'.   *sfixt-angaliázo* 'embrace tightly'
    i.   *sighá* 'softly'           i'.   *sigh-o-traghudhó* 'sing softly'
    j.   *stravá* 'slanted'        j'.   *strav-o-kitó* 'look sideways'    (Rivero 1992: 299)

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[18] However, this behaviour is far away from regarding it as universal, since temporal adverbs and sentence adverbials do incorporate in Chukchi, as Spencer (1995: 461f.) shows.

[19] The typical ending of the MG adverbs is *-a*. The typical union vowel in Greek compounds is *-o-* which deletes the adverbial ending *-a*. When the verb root begins with the vowel *a*, the union vowel *-o-* is usually deleted (see h'). With the adverb *ksaná* 'again' the union vowel does not appear (see 42), perhaps an indication of incorporation in the syntax (cf. Smirniotopoulos/Joseph (1998)).

*Aktionsart*[20] adverbs incorporate into the verb stem of many polysynthetic languages, e.g. in Chukchi, cf. (45). The same happens with the Aktionsart adverbs in MG, cf. (46).

(45)  Chukchi
      a. *nə-tur-ew*          *nətejkəkinet*        *nelgət*
         ADV-new-ADV          they.are.making       skins

      b. *nə-tur*         = *tejk-əkinet*[21]  *nelg-ət*
         3PL.S-new        = make-3PL.O       skin-ABS.PL

      'They are making skins again.'                        (Spencer 1995: 455)

(46)  a. *O*      *Ghiánis*      *ghráfi*          *ksaná*   *tin*    *perílipsi.*
         the      Ghiánis        he.writes         again     the      summary

      b. *O*      *Ghiánis*      *ksana-ghráfi*              *tin*    *perílipsi.*
         the      Ghiánis        again-he.writes             the      summary

      'Ghiánis writes the summary again.'

As to the Greek verbs which allow AI, these are non-stative and refer to actions, processes, and changes of state (cf. Rivero 1992: 300f. and the references therein), cf. the grammatical pattern in (47b) with the ungrammatical one in (48b).

(47)  a. *Ta pedhiá katikún KONDÁ.*
         'The children live close.'

      b. *\*Ta pedhiá KONDOkatikún.*                        (Rivero 1992: 301)

(48)  a. *Ta pedhiá símosan KONDÁ sti fotiá.*
         'The childern approached close to+the fire.'

      b. *Ta pedhiá KONDOsímosan sti fotiá.*
         'The children came close to the fire.'              (Rivero 1992: 301)

As in the case of NI (see section 5.1), AI cannot be regarded as a regularly productive, compositional (= syntactic) process. On the one hand, the union vowel *-o-*, which appears equally in MG noun and AI is an indication of a lexical compounding process. On the other hand, there are many semantic and morphological complications, e.g. the free adverb phrase can have a different meaning than the incorporated pattern, cf. *stékome kondá* 'I stand closely'

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[20] In Rivero (1992: 307–314) 'Aktionsart' is distinguished from aspect. 'Aktionsart' is considered as 'a characteristic of the inherent meaning of a verb' and may appear as durativity or iterativity. According to the same author, 'aspect' adverbs, such as *akómi* 'still' and *mólis* 'just', fail to incorporate in MG, as opposed to 'Aktionsart' adverbs, such as *sixná* 'often' and *dhiplá* 'twice', which do incorporate. I suggest that this distinction is not always valid, given the fact that adverbs such as *sixná,* which modify situations irrespective of the perfective/imperfective (= aspect) distinction, fail to incorporate, cf. the grammatical (ia) and (iib) with the ungrammatical (ii). An incorporated pattern with *miláo*, i.e. *sixnomilái*, was attested only once in a poem by Ioanis Vilaras (see http://arcadia.ceid.upatras.gr/arkadia/culture/personalities/vilaras.htm, accessed May, 2008) and thus cannot be regarded as a corroborating evidence.

(i)   a. *O Ghiánis*    *mílise*      *sixná*   *ja*     *to*     *parelthón*   *tu.*    [PERFECTIVE]
         the Ghiánis     he.spoke      often     about    the      past          his
         'Ghiánis often spoke about his past.'

      b. *O Ghiánis*    *milái*       *sixná*   *ghia*   *to*     *parelthón*   *tu.*    [IMPERFECTIVE]
         the Ghiánis     he.speaks     often     about    the      past          his
         'Ghiánis often speaks about his past.'

(ii)     *\*O Ghiánis*  *sixno-mílise/sixno-milái*          *ghia*   *to*     *parelthón*      *tu.*
         the Ghiánis     often-he.spoke/often-he.speaks      about    the      past             his
         'Ghiánis often spoke/often speaks about his past.'

Furthermore, the 'Aktionsart' adverb *páli* 'again' was not attested in an incorporation pattern, against Rivero's prediction (Rivero 1992: 307). This issue requires further investigation in order to define the exact semantics of the incorporating adverbs.

[21] In the Chukchi examples I follow Spencer (1995) who indicates incorporation with '=' before the verb stem.

and *kondostékome* 'I stop for a little time' or the incorporated adverb can appear in an etymologically and morphologically distinct form than in the free adverb phrase, cf. *perpatáo ghríghora* and *ghorghoperpatáo,* both meaning 'walk quickly' (see Smirniotopoulos/Joseph (1998) for further examples and details).

Nonetheless, if we depart from a pure syntactic analysis we have to admit that there are several regular patterns which give AI in MG a character similar to that of polysynthesis proper (see also next section).

## 6 Modern Greek in relation to affixal and compositional polysynthesis

In this section, I present Mattissen's (2003) distinction of affixal and compositional polysynthesis, and then apply this distinction on MG. I first cite her comprehensive description of these two language types:

> (i) languages which use non-root bound morphemes [...] and allow only one root per verb complex, which we will henceforth call the affixal strategy, or (ii) languages which *ad hoc* combine more than one lexical root in a verb form to attain a polysynthetic form, called the compositional strategy [...] Affixal and compositional polysynthesis are not complementary types: affixes (non-root bound morphemes) are a necessary condition for the recognition of polysynthesis.
>
> (Mattissen 2003: 281f.)

The pervasive existence of non-root bound morphemes in MG is already mentioned in (b) of section 3. The question which immediately arises is whether MG consequently follows one of the two strategies mentioned above or a mixed strategy, at least in some of its verb forms. As regards to the *affixal* strategy (see (i) above), see (14) from Greenlandic, repeated here as (49).

(49)   Greenlandic
       *aliikku-sirsu-i-llamma-ssua-a-nirar-ta-ssa-galuar-paal=li*
       entertainment-provide-AP-one_good_at-big-be-say-HAB-FUT-but-IND:3p>3s=but
       'However, they will say that he is a great entertainer, but...'
                                        (Fortescue 1983: 97, in Mattissen 2003: 282)

As mentioned in (b) of section 3, in (49) the whole sequence is considered as a verb form, with *aliikku* being the only root in the verb complex. All other morphemes are suffixes (*=li* is an enclitic), i.e. non-root bound morphemes or the final inflectional suffix (cf. Mattissen 2003: 282).[22] Extreme derivation patterns such as these are not attested in MG, a fact that *definitely* distances MG from affixal polysynthesis towards compositional polysynthesis.

As regards to *compositional* polysynthesis, a typical member is Chukchi, allowing several roots within one word form, making use of NI, AI, etc. On top of this, in Chukchi there are non-root bound morphemes expressing, for example, person marking, valence operations (e.g. reflexive, reciprocal), aspectual categories, degree, manner, reversative, direction, etc. (see Mattissen 2003: 282f. and the examples/references therein).

In section 5.1 I have mentioned that NI in MG is likely to follow a compositional strategy only in a limited way, because it shows many lexicalized patterns without a transparent counterpart, i.e. the relevant patterns are not always *ad hoc* formations (see (ii) above). On the other hand, AI is not particularly productive (cf. Smirniotopoulos/Joseph 1998). However, there are indeed non-root bound morphemes, such as (a) person markers (see section 2), (b) aspectual categories (integrated into TAM suffixes – see sections 1 and 2), (c) valence operators, e.g. the reflexive *afto-* and the reciprocal *alilo-* (see (f) of section 3), (d) prefixes which express degree, e.g. *para-* 'excessively,' *kata-* 'completely,' 'very much,' *kse-*

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[22] The derivation of another Eskimo sentence is exemplified in (c) of section 3.

'completely,' 'very much,' etc., manner, e.g. *ksaná* 'again,' reversative, i.e. *kse-* (equivalent to the English *un-*), opposition/substitution, i.e. *anti-* 'opposite,' 'against,' 'instead,' a.o. (see Warburton 1970: 62f).

Mattissen (2003) regards ad hoc *verb root serialization* as a necessary condition for the assessment of compositional polysynthesis, a pattern which is only marginally attested in MG. I cite two examples from verb root serialization in Chukchi (see (50a) and (51a)) with their synonymous analytic counterparts (see (50b) and (51b), respectively).

(50)  Chukchi

    a.  *tə-gagcaw=kətgəntat-gʔak*
       ISG-hurry=run-1SG
       'I ran, hurrying.'

    b.  *ətlon  gagcaw-a      nə-kətgəntat-qen*
       he      hurry-GER     PERF-run-3SG/PERF
       'He ran, hurrying.'                                    (Skorik 1948, in Spencer 1995: 456)

(51)  Chukchi

    a.  *galga-t      nə-riŋe=ekwet-kinet*
       bird-ABS.PL  PL.S-fly=depart-3PL.S

    b.  *galgat       riŋe-te        nekwetkinet*
       birds         fly-GER        left
       'The birds flew away.'                                        (Spencer 1995: 456)

Patterns such as those in (50) and (51) are not attested in MG. There are only a handful of verb root serializations, such as *anavo-svíno* 'switch on-switch off', *anev-o-katevázo* 'take up-take down', *anev-o-katevéno* 'go up-go down', *trogho-píno* 'eat-drink', *anigho-klíno* 'open-close', *beno-vghéno* 'come in-get out', mapped onto a concrete semantic pattern, i.e. *action/opposite of the action* (*trogho-pino* may be better considered as a coordinative compound). The verbs *tremo-pézo* 'blink', 'flare', (literally: 'tremble-play') and *tremo-fégo* 'coruscate', 'flare' (literally: 'tremble-beam/radiate') are lexicalized formations.

These restricted patterns vis-à-vis verb root serialization force us to characterize MG as a language close to the polysynthetic 'Mixed II' type, i.e. a language with non-root bound morphemes, NI (although restricted, see section 5.1), with one or more roots per verb form (see NI in section 5.1 and AI in section 5.2). Polysynthetic languages of this type are Takelma and Blackfoot (this categorization relies on Mattissen 2003: 287; for the other types of polysynthetic languages see Mattissen ditto).

## 7      Reference and predication strategies in Modern Greek and polysynthesis

Apart from the fact that NI and AI  appear to be processes with restricted productivity in MG, resulting in many cases in word forms with non-compositional semantics (see sections 5.1 and 5.2), the attested slot patterns (see section 2) have no pervasive character and the appearance of the pronominal markers before a verbal head is massively influenced by discourse factors, cf. the following situations:

(i) John asks Mary what the teacher does with a pupil in the classroom. John can't see the scene. The book is mentioned as a noun in John's question (see (52)).

(52)  a.  John: *Tí káni tóra me to vivlío?*
        what he.does now with the book
        'What does he do now with the book?'

    b.  Mary: *Tu-to-dhíni.*                         [Two pronominal markers: goal-theme]
        to.him-it-he.gives
        'He gives it to him.'

(ii) John asks Mary what the teacher does with a pupil in the classroom. John can't see the scene. The book is not mentioned in John's question at all (see (53)).

(53)  a.  John: *Tí káni tora?*
          what he.does now
          'What does he do now?'

      b.  Mary: *Tu-díni to vivlio.*                     [One pronominal marker: goal]
          to.him-he.gives the book
          'He gives him the book.'

(iii) John asks Mary what the teacher does in the classroom. John can't see the scene. The book and the pupil is not mentioned in John's question at all (see (54)).

(54)  a.  John: *Tí káni tóra o dháskalos?*
          what he.does now the teacher
          'What does the teacher do now?'

      b.  Mary: *Dhíni to vivlío sto mathití.*           [No pronominal marker]
          he.gives the book to.the pupil
          'He gives the book to the pupil.'

In (52b) there are two pronominal markers before the verbal head, in (53b) one and in (54b) none. This patterning is not the same with the patterning of pronominal markers in polysynthetic languages. The pronominal markers in Cayuga, for example, are *obligatory* and in principle denote two core arguments, i.e. "agent" and "patient" or "actor" and "undergoer". The precise interpretation of these arguments is not fixed but conventionalized, according to the lexicalized argument structure of the verb, e.g. the first argument may be agent, experiencer etc., the second argument may be patient, goal, location (in the last case with the addition of an applicative suffix), etc. (see Sasse 1999: 37–39). On the other hand, in MG the first PM denotes the goal (or sometimes the beneficiary) and the second PM the theme (see (52)).

On top of this, the *elaboration* principle of sentence structure which appears in Cayuga and the other North American languages is not the same as in MG. In particular, the appositive relation of a coreferential participant expression (word) to the pronominal markers of a verb base denoting the fundamental situation, is different. As Sasse (1988: 194) argues, in Cayuga the verbal character of all minimal units (i.e. words) in the sentence, force this appositive relation as a functional necessity. To become less abstract, cf. (55).

(55)  Cayuga

      *a-ka:khe:-ˈkẽ'*            *te-kae-yahshé:*                *kae-ksa:'-áh*
      FAC-1SG/3PL-see            DU-3PL.F/3SG.N-be.two.people    3PL.F/3SG.N-be.child-DIM
      'I saw two children.'                                     (adapted from Henry/Hill 1994)

All three sentence units in (55) are "verbs" and contain verb bases, i.e. *kẽ'* 'see', *yahshé:* 'be two people,' and *ksa:'-áh* 'be a child'. The pronominal two-place prefixes *ka:khe* and *kae* are referential and obligatory. We see thus that the elaboration pattern (approx.) "I saw persons" → "they were two people" → "they were children" is forced by the verbal character of these three units, whereby the basic situation, i.e. (approx.) 'the seeing of persons', must be mentioned in the first place. This is not the case with a corresponding MG sentence, cf. (56).

(56)  *Ta-ídha*          *ta*       *pedhiá.*
      them-I.saw          the        children
      'I saw the children.'

In (56), the appositive relation of *ta pedhiá* to the pronominal marker *ta-* before the verb *ídha* is not motivated by the verbal character of the contained units, since in MG there is a clear

verb-noun distinction (the verb is predicated of nominal arguments). On top of this, the pronominal marker *ta-* is *optional*, i.e. it can be absent in different contexts (cf. (52)–(54)).

For further differences between the systems of polysynthetic languages and MG, cf. Mithun (1988). The grammatical (esp. nominal) categories established in the western literature for the description of European languages, such as number, gender, and case have no immediate correlates in the morphological systems of the North American languages. The inflectional categories of the European noun are mostly derivational in the polysynthetic languages and are marked on the verb (cf. the notion of *head-marking* in section 4). The conclusion to be drawn is that, notwithstanding all attested analogies, both systems are not structurally isomorphic (cf. Mithun 1988; cf. also Sasse 1988, 1993).

## 8      Conclusions

The analysis in sections 1–7 has shown that MG is a language with many polysynthetic tendencies/traits but is *not* a polysynthetic language. As already mentioned in Charitonidis (2007), MG has a moderate, and in several cases strong, index of synthesis (the two extremes being *isolating* and *polysynthetic*) and a moderate index of fusion (the two extremes being *agglutination* – with straightforward segmentability – and *fusion* – with no segmentability).[23]

The slot patterns of the Greek verb described in section 2 yield polymorphemic words and are similar to the patterns in many polysynthetic languages, esp. the North American languages. However, the pronominal markers have no obligatory character (see section 7); there is also no pronominal head-marking on nominals in combination with a co-referential NP (see section 3).

Section 3 has underscored a pervasive phenomenon common in MG and many polysynthetic languages: the existence of a large number of bound morphemes together with a limited stock of independent stems. Fortescue's (1994) eight traits of polysynthesis received four different values. It is interesting that four of these traits have received the value 2, i.e. "non-pervasive but recurrent."

Head-marking is an important trait of polysynthesis but in MG it is not pervasive. The inflectional verb ending is a regular head-marking element but is also attested in many Indo-European languages. However, this trait is synchronically and diachronically motivated in both polysynthesis and MG (see section 4). The development and strengthening of this trait in MG may contribute to the evolution of a new system away from the traditional dependent-marking strategy and simple synthesis towards head-marking and polysynthesis.

NI is marginal in MG. Again, there are many similarities with polysynthesis but the attested patterns do not point to a productive/adhoc process (see section 5.1). On the other hand, AI is a recurrent phenomenon showing many regularities (see section 5.2). The insertion of a noun or an adverb into slot patterns together with NI/AI yields a compound polysynthetic pattern (see section 2).

Mattissen's (2003) account of polysynthesis suggests that MG is definitely dissociated from the affixal strategy, operating for example in Greenlandic Eskimo (see section 6). However, the fact that MG is associated with languages such as Takelma and Blackfoot following the compositional strategy (in Mattissen's terms) does *not* suggest the isomorphic status of MG with these languages.

The problem of isomorphism is taken up in the last section. Leaving aside that the inflectional agreement-ending denotes the agent in most of the cases, the presence of object markers is massively influenced by discourse factors. On top of this, there is no consistent agent-patient

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[23] This categorization relies on Comrie (1981); see section 1.

encoding within the verb complex by means of inflection – a regular phenomenon in polysynthetic languages such as Cayuga. This optionality is closely connected to the elaborated noun-verb distinction and the predominant dependent-marking patterns in MG which distance MG from the verb-oriented polysynthetic languages.

The juxtaposition of independent pronouns or noun phrases to the incorporated pronominal markers (as well as to the agreement ending) in MG has a different character in comparison with the polysynthetic juxtaposition. The structure of apposition in the North American languages is functional and has the role of mentioning the presupposed entities in a basic situation throughout the sentence. In MG, apposition is mainly used for selectively emphasising or disambiguating entities embedded in a concrete situational context (see section 7).

## Abbreviations

| | | | |
|---|---|---|---|
| ABS | absolutive | MG | Modern Greek |
| ACC | accusative | MOD | modal marker |
| ADV | adverb | N | noun / neuter |
| AGR | agreement | NE | a particle |
| AI | adverb incorporation | NEG | negation |
| AP | antipassive | NI | noun incorporation |
| APPL | applicative | NONACT | nonactive |
| AS | aspect suffix | NR | noun root |
| CON | contrastive | O | object |
| DIM | diminutive | P | possessor |
| DIS | dislocative | PERF | perfective |
| DS | derivation suffix | PL | plural |
| DU | dual | PM | pronominal marker |
| DUPL | duplicative | PURP | purposive |
| F | feminine | s, SG | singular |
| FAC | factual | S | subject |
| FUT | future | SJ | stem joiner |
| GEN | genitive | SUBJ | subjunctive |
| GER | gerund | SVO | subject-verb-object |
| HAB | habitual | TAM | tempus-aspect-modus |
| HORT | hortative | V | verb |
| IND | indicative | VR | verb root |
| INSTR | instrument | VSO | verb-subject-object |
| M | masculine | | |

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