1. MORPHOMETAPHORICITY
The semiotic principle of metaphoricity derives from that type of icon that the philosopher Charles S. Peirce calls metaphor. Metaphors, as well as images and diagrams, are particular instantiations of the superordinate category of ‘icon’. As Peirce (1965) puts it, an icon is a sign exhibiting a resemblance with the object it denotes. Thus icons are the most natural signs. When dealing with the degree of resemblance between an iconic sign and its object, Peirce distinguishes three subtypes of icons, i.e. image, diagram and metaphor.

An image is an icon directly representing the features of an object. A photograph is a typical image of what it represents. In language, images are mainly onomatopoeic words, imitating by the phonological structure of their signans bird cries, sounds, etc.

Diagrams are icons which in some way represent the structure of their object. For instance, a geographical map reproduces by analogy the structure of its referent. Similarly, a verbal diagram is a sign showing analogy of structure between signans and signatum. For instance, an agent noun, such as kill-er, derived via affixation from the verb kill, is a typical diagrammatic sign, insofar as the addition of phonological material (-er) to the signans of the derivational base (kill) reflects analogically the addition of meaning (‘AGENCY’) to the meaning of the verbal stem (‘KILL’).

Finally, metaphors are the least ‘iconic’ icons because they simply exhibit a parallelism or a partial resemblance with their denotatum. For instance, a tarot card showing sticks is a metaphor of a forest.

Natural Morphology regards a verbal metaphor as a sign characterised by a partial similarity between signans and signatum. As a matter of fact, it can be predicted that a morphological metaphor (Crocco Galèas 1990, 1997), i.e. a sign based upon the principle of metaphoricity, is semantically complex but morphotactically unanalysable. By using such premises, we can say that a typical morphological metaphor is a sign obtained as a result of a process of conversion. A denominal verb like bottle,
father, name, can therefore be interpreted as a morphological metaphor, namely a sign in which the complexity of the signatum, with respect to that of its morphological base (e.g. the nouns bottle, father, name), is not paralleled by a diagrammatic addition of signans. Therefore there is no diagrammatic (or bi-unique) relation between the signatum of a verb such as bottle, resulting from an addition of meaning to the meaning of the noun bottle, and its corresponding signans which, unlike any diagrammatic sign such as kill-er, cannot be segmented into its constituents. In other words, a morphological metaphor does not show analogy of structure between signans and signatum.

Morphometaphorical rules consist of a metaphorical operation by which the signans of the input coincides with that of the output, e.g. name → to name, to wash → (a) wash. Apart from eventual inflectional affixes that may intervene and therefore redundantly define the distinction of word-class, the lexical signans of a morphological metaphor, i.e. the output of morphometaphoricity (e.g. nameV, washN), does not differ from the lexical morpheme of the base (e.g. nameN, washV). This implies that no derivational affix and no modification is added or applied to the phonological shape of the base.

Within the theoretical framework of Natural Morphology, morphometaphoricity constitutes one of the parameters of morphological universal naturalness.

2. SEMANTIC METAPHOR AND MORPHOLOGICAL METAPHOR
Since neither a derivational (e.g. affixation) nor a modificational (e.g. apophony or Umlaut) means can interfere with a process of morphometaphoricity, the signans of a morphometaphorical rule of word-formation is adiagrammatic in relation to its signatum, but not aniconic. In fact, the sameness of signans between input and output does not impede the compositionality of any signatum, because the metaphorical operation is signalled by the difference of syntagmatic collocation. In other words, the lack of diagrammaticity is replaced by the indexical function of the syntagmatic context. The metaphoric iconicity of a morphological metaphor becomes evident both in the mere parallelism that links the signans with its signatum and in the crucial role played by the change of syntagmatic environment. More specifically, the weak resemblance connecting signans and signatum is counterbalanced by the indexical role of the phrasal context.

A morphometaphorical rule is therefore a morphological rule of word-formation based upon a metaphorical operation. This operation can be better illustrated by making a comparison with the semantic metaphor or trope, e.g. the evening of life, where evening stands metaphorically for ‘old age’. Any semantic metaphor (e.g. evening in the metaphorical expression
evening of life) requires a different syntagmatic collocation of a given word assuming a new meaning. A semantic metaphor is properly realised through the change of position of a certain lexeme within the syntagmatic relations indicated by a phrase marker. The change necessarily involves the coinage of new, although temporary meaning (e.g. ‘old age’ for evening), which is called the metaphoric meaning in contrast to the literal one (e.g. evening in the sense of ‘last part of the day’).

In a similar way, a morphological metaphor shows invariance of signans and change of signatum with respect to the input of the rule. The modification of the signatum is indexed by the syntagmatic collocation. Two further aspects have to be stressed, though. First, the invariability of the signans entails both the sameness of the lexical morpheme and the absence of a derivational affix or any type of modification bearing somehow a phonological difference between the base of a morphometaphorical rule and its corresponding output. However, this does not exclude the fact that different inflectional affixes may characterise the input and the output respectively (e.g. (the) name-s vs. (he/she) name-d). Secondly, the syntagmatic environment differentiating input and output unequivocally indicates the signatum of a morphological metaphor. Nevertheless, in contrast with a semantic metaphor, the metaphorical modification of the signatum of a morphological metaphor does not imply a complete change of the lexical meaning of the base. The change affecting the signatum of any morphological metaphor is basically the same kind of modification that occurs between input and output in any word-formation rule, i.e. word-class and syntactic features. Analogously, the lexical meaning of a morphometaphorical operation undergoes a modification comparable to that of an addition of intensional meaning occurring as in any diagrammatic rule of affixation.

3. NATURAL MORPHOLOGY
According to the theory of Natural Morphology what is ‘natural’ is cognitively simple, easily accessible (especially to children acquiring their first language), elementary and therefore universally preferred. Hence, ‘natural’ equates with derivable from human nature and cross-linguistically concerns tendencies for non-markedness or less markedness. The theory of Natural Morphology takes ‘naturalness’ as a cover term for a set of more specific terms to be defined in three sub-theories: (1) a universal markedness theory of morphological naturalness, (2) a theory of typological adequacy, and (3) a theory of system-dependent naturalness or system-adequacy.

The sub-theory of universal markedness is a preference theory (cf. Vennemann 1983). It establishes deductively degrees of universal preferences on a restricted number of natural parameters, e.g.
diagrammaticity, morphotactic transparency, morphosemantic transparency, indexicality. The parameters of universal naturalness/markedness express cross-linguistic preferences or tendencies for certain morphological techniques, operations, and rules over others. For instance, the morphological technique of derivation via suffixation is highly preferred by the languages of the world, whereas modificational techniques of apophony and Umlaut are relatively less frequent. On the other hand, the morphological operation of suppletion is very rare and unproductive, while the distinct operations of affixation, i.e. suffixation, prefixation, infixation, interfixation, and circumfixation, have a decreasing value of naturalness, that goes from a maximum (suffixation and prefixation) to a minimum (circumfixation).

The parameters of Natural Morphology are deduced from extralinguistic bases and are shaped according to a semiotic metalevel that organises the cognitive foundations upon which the theory itself hinges. Thus, the parameters of Natural Morphology represent the formalisation of functions and semiotic principles, which derive from the extralinguistic bases assumed by a functionalist and semiotic model of morphological theory. These parameters have the form of implicational scales from most to least natural, where ‘natural’ means ‘easier’ for the human brain. Thus, drawing on the theoretical basis of Natural Morphology, I have proposed a morphological parameter of metaphoricity (Crocco Galèas 1990, 1991, 1997), which can be deduced from the semiotic principle of metaphoricity. This, in turn, can be regarded as a natural consequence of the Peircean definition of metaphor.

4. THE PARAMETER OF MORPHOMETAPHORICITY

The parameter of morphometaphoricity allows the adequate interpretation of forms that otherwise could not be subsumed under the parameter of diagrammaticity. In fact, rules of conversion are considered unnatural from the angle of diagrammaticity. In linguistic literature they have been classified and labelled in numerous ways (see Crocco Galèas 1991, 1997), e.g. transposition, conversion, zero-derivation, multifunctionality. The identification of an alternative parameter of naturalness that refers to a weaker form of iconicity, namely metaphoricity, permits the organisation of different types of morphometaphors as it appeared evident from an investigation based upon a corpus of 44 languages (Crocco Galèas 1997).

The parameter of (morpho)metaphoricity makes the evaluation of several rules of word-formation in the languages of the world possible. According to the definition of morphological metaphor, the parameter of morphometaphoricity predicts that word-formation rules based on metaphorical operations show varying degrees of naturalness according to
certain criteria that essentially pertain to the technique of morphometaphoricity. These criteria have allowed me the elaboration of four distinct scales of morphometaphoricity. The criteria and their corresponding scales are the following: 1) directionality, 2) identifiability of the base—signans, 3) morphosyntax, and 4) change of signatum. In this paper I will only consider the application of the criterion of directionality to the morphometaphorical rules of English.

4.1. The scale of directionality
The first scale orders different types of morphometaphorical rules on the basis of the criterion of directionality. Morphometaphorical rules of word-formation differ depending on the possibility of interpreting the direction of the rule. Whenever the input and the output of a morphological process are easily recognisable, the morphological process has the format of a rule. A rule entails that there be a direction from a given base to a related complex sign. Such directionality requires that both signantia and signata be transparent, i.e. analysable into their constituents. Since a metaphorical operation of word-formation lacks diagrammaticity, one cannot rely upon signantia to identify input and output respectively. The signans cannot be segmented and the segments mapped onto the signatum. The signatum, however, is composite. Thus, in order to distinguish base and metaphor, directionality must be retrieved despite the absence of parallel addition (or modification) of form.

The scale of directionality allows the degree of naturalness to be defined in conformity with the parameter of metaphoricity. In other words, the morphometaphorical naturalness of a word-formation rule can be evaluated in relation to the criterion of directionality. In this regard, morphometaphorical rules show different degrees of naturalness depending on the increase/decrease of retrievability of directionality. The most natural (morpho)metaphorical sign is completely identifiable as the complex sign of a morphometaphorical rule. This means that, although no instantiation of diagrammaticity is at our disposal, the rule is equally directed. On the other hand, the most unnatural (morpho)metaphorical sign is multifunctional, i.e. it leaves no possibility of detaching a base from its corresponding morphomorphophor.

4.1.1. First degree: uniqueness of directionality
Metaphoricity is best represented when the direction of a morphometaphorical rule is unique. This is the case of an inflected word, which is merely transcategorised into another word-class without any modification of its complex signans. The source of the metaphorical operation is therefore a polymorphic word-form directly converted with its whole signans into another lexical category.
For instance, Hupa Athapaskan converts the Present (Active or Passive) 3rd Sg. Person of verbs to form nouns: naįya ‘it comes down’ → naįya ‘rain’ (Goddard 1964: 21). Other American languages (such as Navajo, Ocuilteco, Pawni, etc.) show similar rules of transcategorisation.

In Albanian there are deverbal morphometaphorical nouns, whose base is the Present Indicative 1st Sing. Pers. of consonant verbs such as dhën ‘I plane’ → dhën ‘splinter’, pres ‘I cut’ → pres ‘jack-knife’ (Ressuli 1985: 137). Nominalisations of verbal infinitives in many European languages are instances of unique directionality, e.g. Germ. schlafen ‘to sleep’ → (das) Schlafen ‘(the) sleep’, It. potere ‘can’ modal verb → (il) potere ‘power’.

4.1.2. Second degree: formal criterion

Morphological metaphors, whose directionality is signalled by at least one formal criterion, belong to the second degree of the scale. In fact, there are often some recurrent features that allow the metaphor to be distinguished from its base. In general, but not necessarily, a formal criterion can be viewed as membership of a lexical subclass.

In Estonian, for instance, deverbal action nouns are cases of second-degree-directionality morphometaphors, e.g. kadu-ma ‘to echo’ → kadu ‘echo’ (Tauli 1973: 129).

In Modern Greek, the source of morphometaphorical deverbal nouns or adjectives is always a final-stress-verb, e.g. λογταρό ‘to yearn’ → λογτάρα ‘yearning’, κολιφτό ‘to swim’ → κολίμπι ‘swimming’.

In Dutch, the phonological structure of verbs is usually disyllabic and the nucleus of one of the two syllables is a schwa. Nouns, on the other hand, show a larger variety of syllabic structures. However, whenever a verb and a noun appear to be semantically and metaphorically linked, the verb presents the same phonotactic pattern of the noun. For instance, the noun telex is paralleled by the verb telex, whose syllabic nuclei are both different from schwa. This marked phonological pattern of the verb constitutes a formal criterion for the identification of the direction of the morphometaphorical rule: N → V (Don 1993).

4.1.3. Third degree: inversion of directionality

Third-degree morphological metaphors neither result from transcategorisation of inflected word-forms (= first degree) nor presuppose formal criteria distinguishing source and target of a metaphorical operation (= second degree). Nevertheless, they exhibit directionality because of two constraints that may occur either together or separately. First, there must be no other inversely directed morphological metaphor, which may create ambiguity. Second, there must be one or more than one word-formation rule of affixation having the opposite direction. Given these requisites, the retrieval of directionality of a morphometaphor is still possible.
For instance, Albanian has de-adjectival morphomorphemic nouns (e.g. i buté /but/ 'soft' → but /but/ 'pulp') but no denominal morphomorphemic adjectives. Denominal adjectives are only affixal derivatives, e.g. dëm 'harm' → dëmshëm 'harmful'.

We can also mention Italian de-adjectival verbs such as attivo 'active' → attivare 'to activate', which cannot be interpreted otherwise because no opposite rule of morphomorphemicity forms deverbal adjectives. Deverbal adjectives are instead derived via suffixation, e.g. attivare 'to activate' → attiva-bil-e 'activatable'.

4.1.4. Fourth degree: semantic criterion
When neither formal criteria nor systemic constraints operate, semantic criteria may be available to retrieve directionality. Italian, for instance has both denominal morphomorphemic verbs and deverbal morphomorphemic nouns. Deverbal morphomorphemic nouns, though, mainly belong to the semantic category of action nouns, e.g. vidimare 'to authenticate' → vidima 'authentication'. Thus, it is semantically adequate to postulate a verbal base for this type of metaphorical noun.

Kusaie has a metaphorical rule for the formation of ethnic adjectives whose directionality is unequivocally determined by a semantic criterion, e.g. Macrike 'America' → Macrike 'American' (Kee-Dong 1975: 227). Therefore, the input of the rule is necessarily a toponym or a geographical noun, while the output is an ethnic adjective.

4.1.5. Fifth degree: opacity of directionality
If a morphomorphemic subsystem of word-formation shows two rules differing only in their directionality and no semantic criterion intervenes, directionality is opaque. This means that inversely directed morphomorphemes are hard to interpret.

Late Latin, for instance, has two very productive morphological metaphors. One converts nouns into verbs, e.g. spica 'spike' → spicare 'to spike' (cf. Cooper 1895/1975: 225-239), the other converts verbs into nouns, e.g. pugnare 'to fight' → pugna 'fight' (cf. Väänänen 1981). Both rules belong to the fifth degree of the scale of directionality. In fact, it is not easy, by and large, to assign uniquely either the function of source or that of target. However, one semantic criterion is accessible for at least some deverbal nouns. In the lexical subsystem of the language variety of military and sport, morphomorphemic nouns such as pugna 'fight' and lucta 'wrestling' presuppose a V → N direction since their semantic content is invariably that of an action noun (Malkiel 1977).

4.1.6. Sixth degree: ambiguity of directionality
As we have seen, fifth-degree metaphors may be interpreted by means of a semantic criterion, even though this is not widely applicable. Consequently,
rules of opaque directionality may be sometimes directional. On the contrary, morphomorphemes of the sixth degree are less natural since they cannot even rely on the unsystematic intervention of a semantic viewpoint. Pairs of inversely directed rules are therefore ambiguous, since directionality is possible in both ways.

In Kusaie, there are nouns that produce intransitive verbs (e.g. ahng ‘nest’ → ahng ‘to build a nest’) and, on the other hand, intransitive verbs that are converted into nouns (e.g. puhtat ‘to fall’ → puhtat ‘fall’).

In German, although there is a number of formal and semantic criteria identifying the degree of directionality of many morphomorphetrical rules for both denominal verbs and deverbal nouns, morphomorphetrical verbs correlated with nouns ending in -e represent a case of ambiguous directionality. In pairs such as lehren ‘to teach’ – Lehre ‘teaching’, ehren ‘to honour’ – Ehre ‘honour’ both verb and noun can be regarded as either source or target of the morphometrical rule (Fleischer & Barz 1995: 305).

Similarly, there is a number of N-V pairs in Italian such as lavoro ‘work’ – lavorare ‘to work’, gioco ‘play, game’ – giocare ‘to play’, etc., which are metaphorically correlated but directionally ambiguous.

4.1.7. Seventh degree: multifunctionality
Multifunctionality of lexemes represents the last and most unnatural degree of the scale. A multifunctional word belongs to more than one lexical category. Yet, there is no way to find a base of a morphomorphetrical operation in order to distinguish one or more targets. Directionality is therefore irretrievable.

Generally, functional words of Indo-European languages are typical instances of multifunctional lexemes. One example may suffice. German zu can function as a preposition (e.g. Gisela geht zum [zu + dem] Onkel ‘Giselle is going to his uncle’), an adverb (e.g. Dieses Haus ist zu teuer für uns ‘this house is too expensive for us’), and a conjunction (or complementizer) (e.g. Das ist kaum zu glauben! ‘it’s hard to believe!’).

5. MORPHOMETRAL RULES IN ENGLISH
According to both traditional grammars and linguistic literature, conversion rules, i.e. morphomorphetrical rules, have a high token-frequency but a low type-frequency in English. The types that are currently mentioned are basically two: denominal verbs (e.g. nameN → namev) and deverbal nouns (e.g. washv → washN). De-adjectival verbs, such as dirty → to dirty, are said to be less productive, while denominal adjectives (e.g. weeklyA → weeklyN)

\[2\] It can also function as separable verbal prefix, e.g. zumachen ‘to shut’, mach’ die Tür zu! ‘shut the door!’.
are usually regarded as cases of so-called partial conversion or ellipsis (cf. Quirk at al. 1985).

In presenting the scalarisation of English morphometaphors, I will first stress a few preliminaries. Firstly, according to my definition of morphological metaphor and the consequent parameter of morphometaphoricity some further types of conversion are to be added to the traditional list. Their relevance appears evident from the application of the scale of directionality to the analysis of the system of English morphometaphorical rules. Secondly, the scales of the theory of Natural Morphology are implicational scales. In particular, this means that relatively less natural rules of morphometaphoricity, i.e. belonging to lower degrees of metaphoricity, imply the existence of further natural rules, which are assignable to the first degrees of the scale. Indeed, the hypothesis of a gradient of rules showing decreasing naturalness from the viewpoint of morphometaphoricity is confirmed by the application of the scale of directionality to the English data. Thirdly, as with any other scale of morphological universal naturalness, the scale of directionality of morphometaphors assumes that natural degrees represent more productive types, while less natural degrees correspond to comparatively less productive ones. This, as we shall see, applies as well to the English data classified in relation to the parameter of morphometaphoricity.

6. THE SCALE OF DIRECTIONALITY OF ENGLISH MORPOMETAPHORS

English morphometaphorical rules can be assigned to the first, second, third, fourth, and fifth degree of the scale of directionality. In addition, there are a few cases of sixth degree morphometaphors and a number of examples of multifunctionality, i.e. seventh degree lexemes which largely correspond to multifunctional cognates in other Indo-European languages.

6.1. First degree (or uniqueness of directionality): -ing forms.

So-called nominalisations in -ing, e.g. hunting, deverbal adjectives in -ing, such as surprising, and deverbal adjectives in -ed, as in the NP the escaped prisoner, are instances of uniqueness of directionality. As a matter of fact, in all three cases the source of metaphoricity is an inflected verbal form which is transcategorised into N or A lexical category. In particular, nominalisations in -ing are targets of morphometaphorical rules that convert verbal gerunds into nouns, e.g. hunting (as in the hunting of wild animals for sports should be banned), killing (as in these killings must stop), building (as in the building collapsed). Similarly, adjectives in -ing such as surprising (as in his surprising views) or interesting (as in it seemed very interesting), are targets of directionally unique morphometaphorical rules whose source is a
present participle. Finally, adjectives in *-ed* as *worried* (as in *he’s a worried man*) or *expected* (as in *the expected results*) represent the target of a metaphorical rule of adjectivisation which transcategorises a fully inflected verbal source.

Whereas gerunds are traditionally described as verbal nouns, participles are said ‘verbal adjectives’. The term ‘participle’ is etymologically related to ‘participate’ and the idea behind it is that participles share the properties of verbs and adjectives. Two kinds of participle are distinguished: present participles like *taking* and past participle like *taken*. Like a gerund, a present participle contains a verb stem and the suffix *-ing*. But whereas a gerund, or the phrase headed by a gerund, has nominal properties, a present participle, or the phrase headed by one, has adjectival properties. Of course, the form in *-ing* in a sentence such as *she likes writing letters* is a gerund, i.e. an inflected form of the verb *to write*. However, the form in *-ing* in the following sentence *fox-hunting arouses great passion* is a morphometaphorical noun that results from a transcategorisation of an inflected form, i.e. a gerund, of the verb *to hunt*. Similarly, *telling* in *He was telling the truth* is a present participle or, in other words, an inflected form of the paradigm of the verb *to tell*. But, on the other hand, *charming* in *He was a charming fellow* is a morphometaphorical adjective resulting from the conversion of the present participle of the verb *to charm*. In the same way we can distinguish between a verbal form, or more specifically a past participle such as *escaped* in *The prisoner had escaped*, and a morphometaphorical adjective in *The escaped prisoner*. In this second case, *escaped* is the target of an operation of metaphoricity that changes inflected verbal forms into adjectives.

According to traditional grammars gerunds display a combination of verb-like and noun-like properties and, in this respect, they are often said ‘verbal nouns’. Still, a verbal noun is primarily a kind of noun, not a kind of verb. Another perspective would be that of admitting fuzzy boundaries between verbs, nouns, and adjectives. This would imply the recognition of central members of the verb class, which are tensed, and non-tensed or peripheral members which are admitted into the class on the basis of their systematic resemblance to tensed forms. According to a third interpretation, the one that I here propose, nominalisations in *-ing* can be regarded as the result of a nominalisation rule of word-formation and, particularly, a rule of morphometaphoricity. The change of *signatum* between *killing* (gerund) and *killing* (noun) consists in a change of lexical category membership which necessarily implies a different syntactic realisation of the argument structure.

In the same way, participles are regarded as verbal adjectives by traditional grammars. However, the different syntagmatic distribution of *-ing* forms and *-ed* forms as attribute (e.g. *a very charming fellow*) or predicate
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(he was very charming) speaks in favour of a morphometaphorical change of the verbal base into an adjective. Yet, it must be stressed that from a typical categorisation viewpoint past participles illustrate better than present participles the tendency for the parts of speech to be very clearly different at their centres but much less easily distinguishable at their margins. This situation can be interpreted in terms of morphometaphoricity if we admit that the source and target of a morphometaphorical rule of unique directionality are comparatively more differentiated the more a change of semantic content is involved in the metaphorical operation.

The only difference between the English cases of uniqueness of directionality and the Albanian or Amerindian examples above-mentioned (§ 4.1.1.) lies in the semantic change involved by the rules, which seems to be low or null in the English nominalisations and adjectivisations but, on the other hand, very consistent in the Albanian nominalisations. Word-formation rules are regarded as processes that form new lexical entries; however, the lack of evident semantic change does not impede semantically null word-class changes being assigned the status of morphometaphorical rules, i.e. rules of word-formation. Similarly, derived affixal de-adjectival adverbs in -ly (e.g. slowly) imply a low or null semantic change and yet adverbs in -ly are not considered as marginal members of the adjective class or as the result of syntactic processes instead of word-formation processes. The ‘quantum’ of semantic change connected with word-formation rules is variable, but it is not sufficient to invalidate the status of a word-formation process, not even in the case of morphometaphors.

6.2. Second degree (or formal criterion): de-adjectival nouns.
So-called partial conversion can be assigned to the second degree of the scale. There are three sub-classes of de-adjectival nouns that fit into the second degree of the scale of directionality (Quirk et al 1985): a) the innocent (e.g. The innocent are often deceived), b) the Dutch (e.g. The industrial Dutch are admired by their neighbours), c) the mystical (e.g. She admires the mystical).

Type a) adjectives, which can pre-modify personal nouns (e.g. the young people), can be NP heads (e.g. the young) with plural and generic reference denoting classes, categories or types of people. The adjective can itself be pre-modified or post-modified.

Type b) adjectives denoting nationalities can be NP heads. The adjectives in question are virtually restricted to words ending in -ish (e.g. British, English), -ch (e.g. Dutch, French), and -ese (e.g. Portuguese, Chinese) As with type a), these nouns normally have generic reference and take plural concord.
Type c) adjectives can function as NP heads with abstract reference. Unlike type a) and b), type c) adjectives functioning as NP heads take singular concord (e.g. the best is yet to come).

De-adjectival nouns of the second degree of directionality are therefore characterised by one or more formal (or morphosyntactic) properties that point to the difference between the source and the target of the morphometaphorical rule.

6.3. Third degree (or inversion of directionality): de-adjectival verbs.
The third degree of the scale mainly comprises de-adjectival verbs such as to clean, to dirty, etc. Deadjectival verbs are directionally unequivocal because of the lack of an inverse rule of metaphoricity forming deverbal adjectives. In English deverbal adjectives coined through morphometaphoricity do not exist.

Several anomalous and miscellaneous types of conversion chiefly used informally also belong to the third degree of the scale of directionality: conversion to nouns from closed-class words (e.g. this argument contains too many ifs and buts) and from affixes (e.g. -ism), and conversion to verbs from closed-class and non-lexical items (e.g. They downed tools in protest), etc.

6.4. Fourth degree (or semantic criterion): denominal verbs and deverbal nouns.
Denominal verbs (e.g. to butter, to referee) and deverbal nouns (e.g. smell, answer) are the targets of two productive morphometaphorical rules in English word-formation. Since these two rules are directionally inverse they cannot belong to the third degree of the scale. However, on semantic grounds they constitute good instances of fourth degree morphometaphors. In fact, a detailed semantic categorisation of both denominal verbs and deverbal nouns allows, in a great number of cases, a distinction to be made between the source and the target of the rule. For denominal verbs, in particular, there is a number of meaning categories that have been proposed (e.g. Kulak 1964, Marchand 1964, 1969, Rose 1973, Karius 1985).

6.5. Fifth degree (or opacity of directionality): de-adjectival nouns vs. denominal adjectives.
The fifth degree of the scale corresponds to two main types of morphometaphor: de-adjectival nouns such as bitter [a type of beer], weekly, and denominal adjectives such as brick in a brick garage or this garage is brick.

De-adjectival nouns are traditionally interpreted as instances of ellipsis, e.g. as foot-ballplayer, he's a natural [= 'naturally skilled player'].
Yet it must be stressed that morphometaphorical de-adjectival nouns are rather central member of the N category. Indeed, they can take determiners (e.g. He's probably a criminal), can be inflected for number (e.g. one criminal – several criminals), for the genitive case (e.g. the criminals' views), and can be pre-modified by an adjective (e.g. violent criminal).

There is however in English a directionally inverse rule of morphometaphoricty forming denominal adjectives. A noun such as brick, for instance, is converted into an adjective whenever it occurs in predicative (e.g. a brick garage) as well as in attributive position (e.g. The garage is brick, This dress is cotton, this one is nylon, but this one is wool) (cf. Quirk et al. 1985). The occurrence of two opposite directed rules which create de-adjectival nouns and denominal adjectives respectively may in principle give rise to difficulty or impossibility of identification of the morphometaphorical base. For this reason I would propose the assignation of both rules to the degree of opacity. In a number of fifth degree cases directionality can be probably retrieved through class membership criteria or on semantic grounds. For instance, it is much more probable that a word like brick is referentially to be interpreted as a noun rather than an adjective, which, given the adequate syntagmatic context, can be converted into an adjective. On the contrary, a word like weekly is, from the viewpoint of the morphotactic structure, basically an adjective that functions as a noun. Still, on the whole, the existence of two metaphorical rules of word-formation that only diverge as to their reciprocal directionality and do not show consistent semantic subcategorisation criteria, suggests the analyst to score these rules as fifth degree morphometaphors.

6.6. Sixth degree (or ambiguity of directionality): nouns/verbs of feelings
I could only find a very small number of morphometaphors showing ambiguity of directionality. Abstract nouns denoting feelings or moods can be either viewed as source or target of a morphometaphorical process (cf. Marchand 1974a, b), e.g. hate, love, desire, etc. In these cases there is no synchronic device for attributing unequivocally the roles of source and target.

6.7. Seventh degree: multifunctionality
The last and most unnatural degree of the scale is represented by closed-class items that may function in different ways; for instance, after is either a preposition, a conjunction, or an adverb. This phenomenon of multifunctionality, which is frequently attested in relation to closed-class items, characterises English as well as other Indo-European languages.

There is however a number of open-class lexical items that show at least double functionality in respect to two major word-classes. There is
indeed a certain overlap between the adjective and adverb class. For instance, fast in a fast car and drive fast! has identical form in both adjective and adverb function. In standard use, only a limited number of adverbs are formally identical to adjectives. By contrast, in non-standard or very familiar English, the use of the adjective for the adverb is widespread, e.g. don’t talk daft!, she pays her rent regular, they played real good. Whenever the source of morphomorphotic is easily retrievable as an adjective, there is no doubt that the morphomorphotic can be regarded as an example of third-degree directionality, i.e. inversion of directionality. Indeed, the occurrence of a parallel adverb demonstrates that the morphomorphotic adverb is the result of a rule of conversion from an adjective. Still, some words in -ly can function both as adjectives and adverbs, e.g. an early train vs. we finished early today. These instances of double word-class membership are undoubtedly multifunctional items and do not pertain to the system of word-formation.

7. FINAL REMARKS
In section 5, I predicted that the definition of morphomorphoticity and the elaboration of a seven-degree-scale would have implied a reconsideration of all types of conversions that occur in English. The application of the scale to the English data has indeed permitted the classification under the label of conversion, i.e. morphomorphoticity, of a number of phenomena that traditionally are not included within word-formation. These phenomena concern in particular the various first-degree morphomorphs. Furthermore, whenever the principle of scalarity is applied by Natural Morphology, the identification of the extremes of a scale, i.e. the most natural and the most unnatural degree, redefines the area of phenomena under analysis. For instance, adjective-adverb multifunctionality appears as the most unnatural phenomenon that is somehow related to the problem of directionality of morphomorphs. Multifunctionality does not show rule directionality and consequently cannot be assigned to the domain of word-formation.

On the whole, the spectrum of English conversion rules appears to range from a maximum to a minimum of morphomorphoticity, at least as far as the directionality scale is concerned. This is not surprising though, as English does show a great variety of morphomorphorical patterns and a high token frequency as well.

Furthermore, the rules and the phenomena classified according to the scale of directionality go from a maximum to a minimum of naturalness. Unnatural degrees imply more natural ones. And both type and token frequency decrease from the first to the last degree. Nouns and adjectives in -ing, and adjectives in -ed are very productive because they are natural
morphometaphors that show immediate and unequivocal retrievability of directionality. Second and third degree morphometaphorical rules are relatively less productive, but certainly frequent. Fifth and sixth degree rules are comparatively less productive and frequent. Multifunctionality is limited to one case of word-class overlapping and, moreover, it only regards a part of the items of the two classes of adjectives and adverbs.

There is however a question that requires explanation. Fourth degree morphometaphors, i.e. denominal verbs and deverbal nouns, are frequent and productive rules, although they are assigned to the fourth degree of the scale. Indeed, the semantic criterion is a sort of default criterion that emerges whenever more straightforward and formal criteria do not intervene. Natural morphometaphors need some categorial or membership or distributional feature for the identification of directionality. Intrinsic semantic features are on the contrary relatively vague and imprecise. However, if a pair of inverse directed rules coexist and there is no possibility of fixing any formal or distributional criterion, semantics plays a crucial role. Morphometaphoricity is an adiagrammatic morphological technique; in other words, it always changes the grammatical properties and sometimes the semantic content of the base, while leaving its phonological and prosodic structure intact. Therefore morphometaphoricity raises certain special problems of analysis. In the first place we are faced with the problem of deciding which is the original form and which the morphometaphorical. That is why rule directionality constitutes a fundamental criterion for the scalarisation of the parameter of morphometaphoricity. Nevertheless, English has two directionally opposite rules of conversion for denominal verbs and deverbal nouns that predominantly rely on semantic subcategorisation for the distinction between source and target. Natural Morphology claims that the morphological type of a language is a determinant factor for the evaluation of the degree of naturalness/markedness of its morphological system. Techniques, operations, and rules are selected and preferred not only in accordance with general principles of universal naturalness, but also in relation to the typological structure of the morphological component. English is a relatively isolating language and, more specifically, a non-inflecting language. Its poor inflectional device cannot guarantee a sharp formal distinction between different word-classes and, in particular, between nouns, verbs, adjectives, and adverbs. It is therefore not by chance that, apart from the first and most natural degrees of the scale of directionality, English favours fourth degree rules of metaphoricity which only rely on semantic criteria. The scarcity of formal cues does not prevent the language from adopting the technique of morphometaphoricity which is a typical isolating morphological technique. Morphometaphoricity still presupposes the presence of word-classes differentiations, but it can do without sharp
inflectional or formal distinctions and hinge on intrinsic features of lexical items or semantic criteria of rules of word-formation.

To summarise, the analysis of English conversion supports the scalarisation of the parameter of metaphoricity, in relation to directionality, and shows a type specific preference for fourth degree rules which are indeed very productive in English, since in this language the typological structure values this morphometaphorical pattern.

8. REFERENCES


