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## IDENTIFYING COMPOUNDS AND COLLOCATIONS AMONG ADJECTIVE-NOUN CONSTRUCTIONS IN ENGLISH

### 1. The intricacies of compound recognition

Compounds establish a tricky category in linguistics. As their very existence rests on the requirement that they consist of more than one word, it is not at all clear what counts as a compound and what as an ordinary syntactic phrase. Thus all of the structuralist criteria for the definition of this category (Olson 2000: 898) impose problems in practice. This is particularly true of English which eschews prescriptive ambitions by favouring variation instead. Diachronically, compounds have resulted from multi-word phrases by a tighter integration of their individual constituents. Descriptively, the criterion of integration should therefore distinguish phrases from compounds across different levels. Orthographically, this integration is not easily discernible in Germanic languages as on different occasions of use the same words may be written in different ways. This is most notably the case in English (*car park*, Lehnert 1971; Sinclair 1996, *carpark*, Sinclair 1996, *car-park*, Cowie 1989; *farm-house*, Lehnert 1971; *farm-*

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*house*, Cowie 1989; *farm house*, Sinclair 1996). Phonologically, the forestress rule does not regularly apply, in particular not with adjectival modifiers. Morphologically, English behaves even worse. Not only is a tighter integration in terms of a formal reduction materialized in a restricted way in English as a non-inflecting language. On a par with other Germanic languages, there are some morpho-syntactic remnants in English which seem to run counter to the distinction between ‘word-forming’ derivation as a lexical process and ‘stem-forming’ inflection as a syntactic process (Blevins 2006: 524). This concerns for instance the distribution of synthetic comparative and superlative forms which are normally treated as inflectional (Blevins 2006: 523). Yet, as such, they may participate in derivational processes, in particular in composition: *older-seeming*, *faster-growing*. This paradox is accounted for by the label of ‘inherent’ inflection (Booij 1996) which may be observed with other compositions in English, for instance with the strong noun plurals in *oxen cart*, *teeth cleaner*, *lice-infested*. Furthermore, English abounds with remnants of the apparently possessive function. In *savings bank*, *arms race*, *systems analyst*, *customs union*, *admissions office*, the originally inflectional genitive –s is treated as linking element. What is more, some possessive remnants in compounds lexically co-exist with their fully-fledged genitive inflections, as e.g. in *girls school* as opposed to *girl’s school* and *girls’ school* (Quirk 1985: 149). Other compounds vary between possessive and non-possessive forms. For instance, the non-possessive compounds *insider report*, *driver licence* exist alongside with their possessive alternations *insider’s report*, *driver’s licence* (Taylor 1996: 309ff). We may find even fully concatenated spellings among these remnants, as in *menswear*, *salesman*, *bridesmade* (Taylor 1996: 307f). The morpho-syntactically marked possessive construction may at the same time orthographically mark the derivational status by being hyphenated, rivalling with the parallel morpho-syntactically unmarked constructions (Bauer 2006: 491):

- (1)  
 (a) *cat’s-cradle*, *cat’s-eye*, *cat’s-tail*  
 (b) *cat door*, *cat-gut*, *catnap*, *cat-walk*

This constructional variability invites generativists to put into question the true compound status of the above possessive constructions, by analyzing them as lexicalized syntactic phrases or collocations instead. Cognitively, the observed usage variability rather gives rise to methodologically refraining from framing the notion of a word into a clear-cut category and thereby discarding a strict distinction between lexicon and syntax (Taylor 2002: 173). Even generativists pay lip service to this insight (Bauer 1998: 410; Clahsen 1999; Pinker 1999; Pinker 2002), yet not taking this conclusion to its consequence. Empirically, their

methodological distinction between rule-governed productivity and prototypically organized semiproductivity remains unwarranted. In particular, the subsystems are not distinguished in terms of a relative threshold or quality, as the frequency measures remain absolute token counts. In this way no account is given of how speakers would switch from the processing of prototypically organized schemas to the processing of hard-wired rules. Thereby inductive processes, occurring for instance in language acquisition and language development, remain unexplained (Bybee 1995: 449f).

In view of the structuralist difficulties with the notion of a compound, the cognitive stance seems more promising for coming to grips with the variability of this category. From this view, the much-pursued generativist distinction between lexicalized phrases or collocations and compounds becomes a non-issue. Favouring a gradient distinction in terms of degrees of lexicalization, we refrain from a formal definition of a compound and will be concerned with the speaker's motivation which gives rise to the integration of two or more stems. More specifically, we explain this motivation in terms of certain constituent meanings changing in the first place, bringing about a formal change in the second place. In this paper we investigate adjective-noun constructions with respect to their liability to lexicalize in collocations and compounds where the motivating force is the development of the adjectival meaning. Constructions are form-meaning correlations instantiated by a prototypically organized network of instances (Goldberg 1995). Our ultimate aim is to recognize these instances through their formal and possibly semantic characteristics in order to implement this procedure in a Natural Language Processing system. The linguistic analysis of this paper is intended to evaluate the possibilities of such an automatic procedure.

## **2. Why attributive adjectives are disposed to undergo composition**

Adjective-noun compounds often eschew the forestress criterion for compound status. By contrast, all compounds and even lexicalized collocations obey the generic reference condition of the modifying constituent. As so-called synthetic or non-inherent modifiers attributive adjectives change the reference or intension of only a subclass of nominal meanings in a similar way as nouns in noun-noun compounds (Quirk et al. 1985: 7.43; Giegerich 2006; Fradin 2008). Being confined to the attributive position, these adjectives are particularly disposed to undergo lexicalization and develop into a compound modifier in combination with the respective nominal meanings. The generic reference of the

modifier in compounds becomes clear by considering the semantic difference of the adjective *sweet* in the synthetic and absolute use. In the noun phrase a *sweet potato* the modification consists in a qualification or description of the referent of the head noun, i.e. absolutely used adjectives delimit the extension or set of entities, as that of potatoes. Extensional evidence of referent modification is provided by the attribution applying equally to the superordinate category in the semantic network of the speakers' knowledge representation (Quillian 1968). Thus, the presence of a SWEET POTATO within their vicinity necessarily entails the presence of a SWEET VEGETABLE. By contrast, the synthetic meanings of attributively used adjectives classify or change the reference, i.e. the intension or type of the modified noun, as in the compound *sweet potato* written as one word in the forestressed and non-inflected German equivalent *Süßkartoffel* (Taylor 1992; Lewis 1976: 10-11; Bolinger 1967; Siegel 1976). This intensional change is achieved through an implicit predication applying to the meaning of the modifying adjective which in turn creates a new type of the entity denoted by the head noun.<sup>2</sup> Extensionally, the modification of a different nominal type does not apply to the superordinate category. Thus, the compound *sweet potato* does not entail the meaning of a vegetable qualified as sweet. Instead, the compound denotes a tropical climbing plant with an edible starchy tuber similar to an ordinary potato in form, but generally sweeter in taste (Quirk 1995; Cowie 1989). The reference-modifying function of the adjective in the compound is obvious from its stronger integration with the noun. Syntactically, this semantic integration is iconically motivated through the adjectival ground being adjacent to the nominal figure. This is always manifested by the adjective's non-modifiability, including its non-gradability, thereby conforming to the non-inflecting condition, as in the German equivalent. Semantically, this behaviour makes synthetic adjectives very similar to nouns, which as modifiers in noun-noun constructions are equally likely to undergo composition. The predicative function of the absolute adjectival use, by contrast, is more contingent to the noun it qualifies. This is equally iconically represented by the more distant position of the adjective in the equative construction.

While many adjectives are polysemous by embodying both absolute adjectival meanings used predicatively and synthetic meanings used attributively,<sup>3</sup>

<sup>2</sup> The distinction between attributive and referential use has been introduced with respect to definite descriptions in noun phrases by (Donnellan 1966) with the ambiguous sentence *Smith's murderer is insane* to point out the difference between the identity of the referent in the referential reading and the non-identity in the attributive reading.

<sup>3</sup> This polysemization becomes particularly evident with the development of a number of synthetic uses of originally gradable, qualifying adjectives: The German adjective-noun compound *Süßwasser* ("fresh water") means "low-salt water of inland waters". *Weit-*

adjectives exclusively confined to the attributive function are always synthetic. It is therefore reasonable to start from this class of adjectives in order to narrow down the instances of adjective-noun constructions to the number of putative compounds and collocations.

## 2.1. Metonymically extended attributive adjectives

We have seen that semantically, adjectives may be confined to the attributive position if their meanings are metonymically extended in reduced constructions. Functionally, constructions are represented as figure-ground relations (Talmy 2000). The reduced predicate of synthetic adjectives may be represented in terms of this relation (Pustejovsky 1995). Constructionally, adjectives are treated as relational predications embodying a valency structure (Langacker 1991: 159ff) according to which they ‘literally’ function as grounds attributing their meanings to specific figures. Semantically, synthetic adjectives do not function as grounds of the meaning of the head noun figure, but of the typical process performed by this (Quirk et al. 1985: 7.31ff). Thus, formally the metonymy arises from the missing predicates of the nominal figures (Pustejovsky 1995). In contrast to Pustejovsky’s notion of ‘logical metonymy’ (Pustejovsky 1995; Fradin 2008), rich frame-semantic knowledge is necessary to explain the mismatch between the nominal figure and the adjectival ground in constructions (Zelinsky-Wibbelt 2000: 210ff).

Examples (2) to (4) illustrate that the interaction between the adjectival attribution and the head noun’s meaning is instantiated by the construction. Semantically, this interaction results in the nominal’s figure being characterized in terms of the MANNER OF ACTING. Formally, this MANNER OF ACTING is related to the intransitive verb construction in the examples given in (2), according to which the nominal figure functions as subject. A system which is described as

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*sprung* (“long jump”) refers to “a jumping exercise in sports defined by a jumping-off point after run-up into a sand hole”. *Heißluft* (“hot air”) means “artificially heated air”. But also general language compounds bear evidence of the adjectives having undergone semantic extension through the interaction with the meaning of the noun. Thus in the compound *Weitsicht* (“farsightedness”), both constituents have developed metaphorical senses, the whole meaning “ability to evaluate the future”. In the compound *Hartnäckigkeit*, (“persistence, stubbornness”) the metaphorical sense of the synthetic adjective combines with the partitive sense of the head noun, “neck” for “person”, whereby “persistent (neck) behaviour” emerges. While the semantic specialization of these synthetic adjectival uses goes hand in hand with their morphological reduction in German compounds, in a non-inflecting language, such as English, this process remains morphologically unmarked. This is why these compounds are difficult to identify in English.

robust implicates a system which is working robustly. A fault described as intermittent makes reference to a fault occurring intermittently.

By contrast, the data described as malicious or corrupt in (4) are data, which are intended to harm others. In these examples, the interaction between the adjectival ground and the nominal figure's meaning is induced by the construction, in which semantically, the MANNER OF ACTING is coupled with a covert AGENT affecting the overt PATIENT.

(2) MANNER-OF-ACTING (SUBJ)

**ADJ(-ly V-ing) S**

(a) *robust system*

(b) *intermittent fault*

(3) MANNER-OF-ACTING (AGENT-ON-PATIENT)

**ADJ(-ly V-ing) AP**

(a) *fault-tolerant multi-processor system*

(b) *self-diagnosable system*

(4) MANNER-OF-ACTED-ON (PATIENT)

**ADJ(-ly V-ed) P**

(a) *malicious data*

(b) *corrupt data*

## 2.2. Denominal attributive adjectives

Morphologically, adjectives which are derived from nouns may be initially confined to the attributive position (Dirven 1999). In being NON-GRADABLE, they are devoid of the typical morpho-semantic feature of adjectives. In addition to the reference-modifying function, this morpho-semantic behaviour renders these adjectives more similar to their nominal origin than to their adjectival derivation (Quirk et al. 1985: 7.31ff). Being formally distinguished in different ways, the constructions of synthetic adjectives described in this section are counterevidence of Blevins' (2006: 523) claim about the distinction between synthetic and absolute adjectival meanings being generally formally unmarked.

More specifically, we will categorize denominal adjectives as instances of morpho-semantic constructions. On the one hand, the examples are meant to illustrate that a number of adjectives derived from nouns are initially confined to the attributive position, due to their synthetic meanings. On the other hand, the distinction between the synthetic and absolute use of denominal adjectives is as-

sumed to hinge on the ability of absolute adjectives to qualify the referent of the noun in the equative construction. The corresponding semantic representations are intended to point out the reduction of the absolute sense. This more general meaning is the result of a metaphorical projection into a broader usage domain, as most clearly evidenced with synthetic *logic-al* being used in terms of a formal definition in contrast to its absolute opponent having been broadened to a common-sense understanding of “expected, necessary, inevitable”. Or synthetic *urban* characterizing a spatial district in contrast to its absolute correspondent having been transferred to the behavioural sense describing the people living in this district. All examples originate either from the ReSIST corpus<sup>4</sup> or from English monolingual dictionaries (Sinclair 1996; Cowie 1989; Quirk 1995).

### 2.2.1. *The N-al N construction*

#### FORMAL/LOCATIONAL ORIGIN – KIND OF

In the synthetic use the adjectivals specify the form or location from which the head noun’s denotation originates, in contrast to the absolute uses equating the entity denoted by the head noun with a contingent kind of state.

synthetic: ORIGINATES FROM (PHENOMENON, LOCATION/FORM)

- (5) *residu-al design fault* “located in”
- (6) *intern-al fault* “located in”
- (7) *logic-al fault/ hardware fault* “form of”
- (8) *statistic-al failure data* “form of”
- (9) *artifici-al insemination/ intelligence/ respiration* “ form of”
- (10) *proportion-al representation* “form of”
- (11) *unidirection-al fault* “form of”

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<sup>4</sup> The ReSIST (*Resilience for Survivability in IST*) network of excellence was carried out as a collaborative effort between the *Center for Computational Linguistics at Vytautas Magnus University* in Kaunas, Lithuania and the *Institute for Applied Information Science* associated with the University of the Saarland, Germany. It was sponsored by the Information Society Technology (IST) priority in the EU 6th framework programme (FP6) under the contract number IST 026764 NoE. Thanks go to Gintare Grigonyte for providing me with her term extraction data base composed within this research project. These data have been manually approved by experts with respect to their termhood. As termhood is generally defined in terms of unithood (Kageura and Umino 1996; Nakagawa 2000), these approved terms are licensed as lexicalized compounds and collocations.

absolute: BE (PHENOMENON, KIND OF)

- (12) *logic-al explanation* “this explanation sounds logical”
- (13) *fundament-al differences*
- (14) *relation-al meaning*
- (15) *proportion-al payment*

PART OF CONVENTION – KIND OF

Synthetic adjectives of this category undergo a particularly redundant combination in characterizing the institutions denoted by the head noun as being part of more inclusive conventions in contrast to the absolute uses being reduced to the equation with a contingent kind of state:

synthetic: PART OF (INSTITUTION, CONVENTION)

- (16) *institution-al investors*
- (17) *government-al institutions*
- (18) *convention-al hardware redundancy*

absolute: BE (PHENOMENON, KIND OF)

- (19) *tradition-al costumes, She's so traditional in her views.*
- (20) *convention-al opinion, She's so conventional in her opinion.*
- (21) *constitution-al reform, The new law was not constitutional.*
- (22) *artifici-al flowers*
- (23) *exception-al musical ability*

EVENT-STRUCTURAL ORIGIN – KIND OF

The synthetic adjectival meanings describe the head noun's entity as resulting from the event structure denoted by the adjectival base noun, whereas in the absolute use the event structural meaning of the nominal base has bleached out in favour of a related more stative meaning directly equated with the head noun's entity.

synthetic: ORIGINATES FROM (PHENOMENON, EVENT STRUCTURE)

- (24) *development-al needs*
- (25) *tid-al wave*
- (26) *habitu-al N*
  - (a) *his habitu-al geniality/ \* character* “regular, usual”
  - (b) *habitu-al criminals/ \* people* “acting by habit”
- (27) *consequenti-al loss*
- (28) *accident-al error*
- (29) *sequenti-al redundancy*
- (30) *increment-al implementation*



absolute: BE (PHENOMENON, KIND OF)

(31) *their habitu-al moaning/ behaviour* “done constantly/ as a habit”

(32) *factu-al comparison, incident-al expenses, procedur-al design, emotion-al response*

Caused ATTITUDE – KIND OF

The synthetic meanings designate an attitude as being conventionally caused by the head noun’s denotation, whereas speakers attribute the absolute adjectival meanings to selected referents of the head noun.

synthetic: CAUSE (PHENOMENON, ATTITUDE)

(33) *critic-al computer system, security-critic-al data, safety-critic-al system*

absolute: BE (PHENOMENON, KIND OF)

(34) *confidenti-al data, controversi-al debate*

### 2.2.2. The *N-ar N* construction

The synthetic adjectival conventionally attributes a CONSTITUTION to the entity denoted by the head noun. By contrast, the corresponding absolute use designates the speaker’s selection of a kind of entity referred to by the head noun. This is most evident with *popular*.

CONVENTIONAL-CONSTITUTION – CONSTITUTION

synthetic: CONVENTIONAL (PHENOMENON, CONSTITUTION)

(35) *molecul-ar structure/ \*make-up, modul-ar system, unfamili-ar data, popul-ar song (in the sense of pop song), line-ar measurement*

absolute: BE (PHENOMENON, CONSTITUTION)

(36) *popul-ar song* “this song is very popular”

(37) *line-ar thinking* “her line of thought is absolutely linear”

LOCATIONAL-CONSTITUTIONAL

The locational sense of this adjectival implicates a particular constitution exclusively attributed to the head noun in the synthetic use, thereby forming a terminological collocation.

synthetic: CONSTITUTION (ENTITY, LOCATION)

- (38) *pol-ar bear/ \*animal, vascul-ar tissue/ \*object, uvul-ar glottis/ \*object, column-ar comment/ \*remark*

### 2.2.3. *The N-ic N construction*

The synthetic adjectival designates the FORM or CONVENTION of the DOMAIN denoted by the head noun. Therby both constituents are forming collocational units in contrast to the absolute uses in which the adjectivals clearly attribute contingent kinds of states to the head noun:

FORM-OF DOMAIN – KIND OF

synthetic: FORM-OF (PHENOMENON, DOMAIN)

- (39) *geriatr-ic care, galact-ic formation, probabilist-ic approach/ fault/ behaviour/ (bi-)quorum system, asymmetr-ic error, realist-ic failure data, volcan-ic eruption, geograph-ic area, geometr-ic means, energet-ic balance*

absolute: BE (PHENOMENON, KIND OF)

- (40) *energet-ic support, determinist-ic rule, therapeut-ic effects, futurist-ic film, tourist-ic journey*

CONVENTION OF DOMAIN – KIND OF

synthetic: CONVENTION OF (PHENOMENON, DOMAIN)

- (41) *scholast-ic era, syntact-ic structure, Cathol-ic Church (as institution), linguist-ic theory*

absolute: BE (PHENOMENON, KIND OF)

- (42) *poet-ic text, syntactic/ semantic analysis, linguistic explanation, catholic church (the purpose of the building)*

### 2.2.4. *The N-y N construction*

The synthetic adjectival designates the TEMPORAL DISTRIBUTION of the entity denoted by the head noun, thus establishing unit status, in contrast to a contingent attribution to a selected referent in the absolute use, where the original sense has been broadened to a KIND OF TEMPORAL DISTRIBUTION:

TEMPORAL DISTRIBUTION – KIND OF TEMPORAL DISTRIBUTION

synthetic: DISTRIBUTED (PHENOMENON, TEMPORALLY)

- (43) *year-ly income, dai-ly basis, hour-ly warning, month-ly publication*

absolute: BE (PHENOMENON, KIND OF TEMPORALLY DISTRIBUTED)

- (44) *time-ly delivery, winter-ly snowstorm, easter-ly sermon, summer-ly weather*

2.2.5. *The N-an N construction*

The synthetic meanings specify LOCATIONS and POSSESSORS as ORIGINS and PARTICIPANTS as AGENTS or PATIENTS of the phenomenon denoted by the head noun, thereby creating a unit in contrast to the contingent attribution of these roles as KINDS in the absolute sense:

LOCATIONAL ORIGIN – KIND OF

synthetic: ORIGINATES –FROM (PHENOMENON, LOCATION)

- (45) *Americ-an dream, Europe-an parliament, laborator-ian analysis*

absolute: BE (PHENOMENON, KIND OF)

- (46) *Afric-an system, urb-an population, paradis-ian landscape*

POSSESSIVE ORIGIN – KIND OF

synthetic: ORIGINATES – FROM (PHENOMENON, POSSESSOR)

- (47) *av-ian flue, Victor-ian era, Republic-an victory, Presbyter-ian Church, librar-ian profession*

absolute: BE (PHENOMENON, KIND OF)

- (48) *Marx-ian theory, pedestr-ian lifestyle*

ACT OF/ON PARTICIPANT ROLE – KIND OF

synthetic: ACT OF/ ON (ACTION, AGENT/ PATIENT)

- (49) PATIENT: *senator-ian election, establishmentar-ian opposition*  
(50) AGENT: *protector-ian meeting*

absolute: BE (ACTION, KIND OF)

(51) *Republic-an opposition*

### 2.3. Attributive adjectives composed of submorphemic units

The class of morphologically identifiable adjectives restricted to the attributive position may be extended significantly, if we consider that English abounds with foreign loans, particularly from the Romance languages. By having recourse to the nominal bases in the donor language French, we can discern a number of synthetic adjectives. Due to their Romance origin, these loans are particularly disposed to develop specialized meanings in collocations with other stems on the path towards lexicalization. Even if strictly speaking, many affixes and bases are not productive in English (Blevins 2006: 507), they display partially productive forms of behaviour, and the significant type frequency of particular patterns should prevent us from discarding these paradigms as taking part in the monolingual speakers' induction of morphological schemas (Bauer 1998: 410). Diachronically, the adjectival derivations of the following collocations are hypothesized to have originated in French and Latin by the Oxford English Dictionary (Onions 1973). Synchronically, they are decomposable into a Romance nominal base and an English productive suffix, as for instance the Latin base *vas-cul* "small vessel" and the adapted English suffix *-ar* in (52), the French base *arbitre* "freedom of will" and the integrated English suffix *-ary* in (53), the Latin base *urb-* "city" and the integrated English suffix *-an* in (54):

(52) *vas-cul-ar tissue*

(53) *arbitrar-y error*

(54) *urb-an population*

### 2.4. Participial adjectives confined to the attributive position

Present and past participles may gradually develop into fully-fledged adjectives. Being initially restricted to the synthetic use, only a subset of participles used in the attributive position are fully adjectival, i.e. display the typical adjectival property of gradability and are functionally equivalent in the predicative position. In the following, we distinguish the synthetic and absolute use of participial adjectives in terms of their formally marked semantic behaviour, and thereby reject Blevins' claim (2006) about their indiscernibility.

### 2.4.1. Present Participles

Adjectives which can be emphasized by adverbials are gradable and may be used predicatively, as illustrated by the absolute adjective *interesting* in example (55a), which originates from a present participle. By contrast, adjectives which don't take modifiers in the attributive position cannot be used predicatively either, as illustrated by the remaining participial adjectives in (55). In this case the participial function of the verb is used in the predicative position to express the PROGRESSIVE aspect. This is in strong conflict with the generic force of the synthetic function of adjectives. The synthetic constraint applies generally to participles formed from intransitive verbs, as exemplified in (55b-55e), and (57).

(55)

- (a) *an interesting story/ a very interesting story/ the story is interesting*
- (b) *a developing country/ \* a very developing country/ a highly developing country/ \* the country is developing*
- (c) *the finishing touches/ \* the very finishing touches/ \* the highly finishing touches/ \* the touches are finishing*
- (d) *the declining stocks/ \* the very declining stocks/ a strongly declining stocks/ \* the stocks are declining*
- (e) *a vanishing point/ \* a very/ hardly vanishing friend/ \* her illness is vanishing*

The adjective-noun collocations in these examples are instances of the construction  $V - ing_{ADJ} N$  with the meaning 'permanently  $V - ingS$ ' (the intransitive subject). Clearly, the participial adjective predicates a non-accidental property in this construction which is difficult to reconcile with the predicative position.

Participial adjectives displaying definitely absolute functions, by contrast, are often based on transitive verbs expressing a mental contact, such as *interesting, touching, striking, embarrassing, astonishing, surprising, convincing, offending, promising, bewildering, confusing, demanding*. In contrast to participles derived from intransitive verbs, these participial adjectives, if used predicatively, rely on the speakers' conceptual knowledge of a transfer taking place to the mind of the recipient. This is to say that conceptually, the meanings of these absolute adjectives are attributed by the covert RECIPIENT *everybody* to the *story* in (56b): while a story interests someone, a story which is interesting has this quality for someone.

(56)

- (a) *The story interests everybody.*
- (b) *The story is interesting (for everybody).*

(57)

- (a) *Look, the vanishing crowd!*
- (b) *The crowd is vanishing.*

In conformity with the referent-modifying function of the absolute use of *interesting* in (56b), the aspect of permanency is also less pronounced. A story which is interesting for one recipient, may not be interesting for another. Being distributionally equivalent to the original participial function expressing the PROGRESSIVE Aspect, the absolute function of *interesting* is also less STATIVE than the synthetic functions of the adjectives given above in (55b-e).

We can also observe that the use of emphasizees as modifiers of present participles follows a cline of referentiality. Typically, those participles used least referentially, i.e. most generically or attributively, are most resistant to modification. These participles are most likely to undergo lexicalization in collocations or even in compounds, as in *declining stocks*, *finishing touches*, *developing country*, *vanishing point*, ordered according to their increasing degree of lexicalization. Note that *declining*, *vanishing* and *finishing* are not categorized as adjectives on their own, although they adopt this function in the respective collocations, whereas *developing* is granted the adjectival grammatical category due to a limited number of collocations establishing an initial mini-paradigm (Cowie 1989).

#### 2.4.2. Past Participles

Past participles used in the attributive adjectival position typically modify the patient argument, as they derive from verbal participles in the passive voice. Therefore intransitive participles may not fulfil this function, as illustrated in (58a) and (58b). The pseudo-passive origins of transitive past participles do not combine with the agent argument, as in the absolute use of the participial adjective in (59b).

(58)

- (a) *a played child*
- (b) *a recently played sonata*

(59)

- (a) *a limited amount of time*
- (b) *my time is more limited now (\* by my duties)*

In the same way as present participles, past participles are often restricted to adopt the attributive function in combination with specific nouns or a sub-class of nouns, where they display, among other semantic extensions, the *STATIVE* meaning. This combinatorial restriction correlates with their semantic integration which also prevents them to “dislocate” themselves into the predicative position, as the examples in (60a) to (60c) point out. These examples illustrate that once these participial forms have developed into meanings which license their attributive adjectival function, they seem to display similar lexicalization trends as the present participles. The normally *TELIC* meanings of the verbal base have become *STATIVE* (Dirven 1999: 59, 62). Again, lexically these forms are not categorized as adjectives, i.e. they only adopt this function in combination with specific noun meanings, which is formally marked in their being confined to the attributive position.

(60)

- (a) *radiation-induced error/ \* the error is induced (by the scientist)/ has been induced by the radiation*
- (b) *undetected error/ \* the error is undetected (by the user)/ has not been detected by the user*
- (c) *uncorrelated fault/ \* the fault is uncorrelated (by the system)/ has not been correlated by the system*

Analogous to the present participial forms given above, the original past participles express the typical meaning of transitive verbs, the change brought about in the patient argument (Bolinger 1967: 19), i.e. they are + *TELIC*. This requires the use with the *CHANGE-OF-STATE* auxiliary *have* in the *DYNAMIC* construction.

The absolute function seems to be confined to participles derived from verbs of creation, which Grimshaw and Vikner (1993) assume to be semantically incompatible with the attributive position. By going further into this issue, Ackerman and Goldberg (1996) refine this assumption, by pointing out that the resultant state expressed by the adjective has to be sufficiently informative vis-à-vis the semantics of the head noun, in order for the attributive modification to be acceptable on its own, without further linguistic modification. They give the following examples:

(61)

- (a) *? a built house*
- (b) *a recently built house/ \* the house is recently built*
- (c) *the frozen river/ the river is frozen*

(61a) seems odd, as Ackerman and Goldberg point out, because the adjectival meaning does not embody the informativeness contributed by the linguistically more complex modification done in (61b). Contrary to Grimshaw's claim, the adjectival modification derived from a CHANGE-OF-STATE verb in (61c) is perfectly acceptable, as it is pragmatically sufficiently informative in relation to the meaning of the noun. What the authors do not mention, though, is the impossibility of the participles of the first two examples to move into the predicative position. The development of the predicative use seems to rely on a conceptual contrast with other qualifying adjectives, which the speaker wants to mark in this way, as in (61c). Rivers may come in a number of different forms, of which the resultant state of freezing is not the most usual or expected one. The unusualness or the contingent nature of this process seems to promote the adjectival into the predicative position. This hypothesis may be corroborated by analogous examples. In (62a) the predicative use distinguishes the letter from machine-written or computer-edited ones. In (62b) the predication is made in contrast to a previous state in which the cup was still intact. This contrastive absolute use nicely points out the intermediate, temporally limited degree of stative-ness. In (62d) the story is meant to contrast with true tellings. In (62e) the contrast with an external cause is intended to be focussed. In (62f) the pottery is set off from industrial mass production. Typically, this pragmatic focus applies to the referent of the modified noun. All participial adjectives have been semantically extended to express an intermediate degree of permanency. This enables them to enter the equative construction in which the referent of the subject noun phrase is compared with the adjectival predication. Due to their intermediate degree of stative-ness, they may contrast with semantically alternate adjectival attributions in this position which achieve the selection of different sets of referents. All this does not hold for the terminological collocations in (60a), (60b), and (60c) where the type of the nominal is generically changed by the participial adjective. This generic application of the modifier blocks the equative construction as no referent of the subject noun phrase may be selected by the adjectival predication. Since a new semantic type evolves from this modification, it is not possible to attribute the adjectival force to the superordinate category of the nominal meaning. Thus, *radiation-induced error* does not imply *radiation-induced result*, as the nominal hyponym represents a new category, incompatible with the hyperonym. By contrast, *a broken cup* implies *a broken piece of dish*, because the superordinate extension of the latter phrase encompasses the subordinate extension of the former. By the same token, *a handwritten letter* can also be referred to as *a handwritten document*.



(62)

- (a) *the handwritten letter/ the letter is handwritten (\* by her friend)*
- (b) *the broken cup/ the cup is broken (\* by the child)*
- (c) *the pre-programmed disaster/ the disaster is pre-programmed (\* by the terrorists)*
- (d) *the invented story/ the story is invented (\* by the child)*
- (e) *self-made misery/ her misery is self-made (\* by herself)*
- (f) *hand-crafted pottery/ the pottery is hand-crafted (\* by herself)*

Note that all of the examples given under (62) contain true adjectivals, displaying contingent stative meanings. This is most clearly pronounced in the copular construction of the pseudo-passive, which is incompatible with the semi-adjectival functions in (60a-60c) which are confined to their synthetic uses in combination with specific noun meanings.

## 2.5. Metaphorically extended attributive adjectives

Numerous adjectives providing grounds to nominal figures in technical domains are recognizable as having undergone metaphorical transfer, and as such are confined to the attributive position in collocations and compounds, by clearly creating a new metaphorical category in this combination, since the valency structure of these grounds 'literally' creates a mismatch with the semantics of the figure:

(63)

- (a) *cheap attack*
- (b) *worm attack*

(64)

- (a) *hard fault*
- (b) *dormant fault*
- (c) *short fault*

## Conclusion

In this contribution we have theoretically explained and empirically illustrated that adjectives are confined to the attributive position on morphological and semantic grounds. Morphologically, this functional constraint is explainable in terms of a number of nominal and verbal bases representing the origin of many synthetic adjectival functions. Semantically, these morphological derivations explain their metonymic extensions which we have pointed out to block their predicative use. These metonymic extensions restrict synthetic adjectival meanings to change the reference of just a subclass of nominal figures. Cognitively, these intimate adjective-noun relationships are very prone to undergo lexicalization. Yet, our examples also point out that the symbolic force of the morphological derivations is counterbalanced by their equally developed absolute functions in other semantic combinations. Depending on their ability to qualify the meaning of the noun, the same adjectival forms may dislocate themselves from these nouns into the predicative position within the equative construction. Computationally, an exclusively formally based fully automatic recognition of adjective-noun compounds has therefore been shown to be infeasible. In order to predict the success of a morphologically and syntactically based recognition of these compound constructions in terms of precision, a statistic evaluation of our data will have to be pursued as a next step.

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