

**FROM CORNER SHOP TO CORNER MAN: CONCEPTUAL RELATIONS
AND CONTEXT IN THE CREATION AND INTERPRETATION
OF NOUN-NOUN SEQUENCES¹**

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ABSTRACT. *In this paper it will be argued that there are two different and equally relevant factors intervening in the creation and interpretation of noun-noun sequences in English. On the one hand, the concepts denoted by the nouns involved will determine some preferences to combine with other nouns, since certain semantic relations are cognitively salient with each semantic type of noun and are therefore privileged. By means of corpus data it will be shown that there are two main types of conceptual relations holding between the two nouns in a sequence, depending on the semantics of the nouns, namely argument relations and adverbial relations. On the other hand, it will be claimed that conceptual combination is a dynamic process that must take context (either world-knowledge, co-text, or situational context) into account.*

Keywords: Noun compounds, noun phrases, semantic relations, thematic relations, conceptual combination, context.

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DE CORNER SHOP A CORNER MAN: RELACIONES CONCEPTUALES Y CONTEXTO EN LA CREACIÓN E INTERPRETACIÓN DE LAS SECUENCIAS DE NOMBRE-NOMBRE

RESUMEN. *En este artículo se argumentará que hay dos tipos diferentes e igualmente relevantes de factores que intervienen en la creación en interpretación de las secuencias de nombre-nombre en inglés. Por una parte, los conceptos denotados por los nombres implicados determinarán preferencias para la combinación con otros nombres, puesto que ciertas relaciones semánticas son más relevantes desde un punto de vista cognitivo y son, por tanto, prioritarias. Mediante datos de corpus se mostrará que hay dos tipos principales de relaciones conceptuales entre los dos nombres en una secuencia, que dependen de la semántica de estos nombres, en concreto, relaciones argumentales y relaciones adverbiales. Por otra parte, se sostendrá que la combinación conceptual es un proceso dinámico que debe tener el contexto (ya sea el conocimiento del mundo, el co-texto o el contexto situacional) en cuenta.*

Palabras clave: Compuestos nominales, frases nominales, relaciones semánticas, relaciones temáticas, combinación conceptual, contexto.

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1. INTRODUCTION

This paper is organized as follows. In section 2, the subject under analysis will be introduced by pointing out the controversial status of noun-noun sequences, which can be located at the crossroads between syntax and morphology. In section 3, I will offer a brief revision of some of the traditional proposals to account for the meaning of noun-noun compounds. In section 4, it will be shown that the concepts denoted by the first or the second noun in a sequence will determine the possibility to combine with certain other nouns as well as the frequency of combination with these nouns, so that nouns create some expectancies as regard the likelihood to combine with certain other nouns. In section 5, it will be argued that the expression of the most expected conceptual relations can nevertheless be overridden by contextual factors, like our knowledge of the world, co-text, or situational context. Finally, in section 6 some concluding remarks will be put forward.

2. NOUN + NOUN SEQUENCES: PHRASES OR COMPOUNDS?

Establishing dividing lines between compounds and phrases is beyond the scope of this paper, though mentioning this issue is unavoidable since noun-noun sequences can be treated either as noun phrases with nominal modifiers or as

compounds. There is, in fact, considerable disagreement regarding the treatment of noun-noun combinations and many consider as compounds collocations that others regard as phrases (see Carstairs-McCarthy 2002: 69).

An example of this can be seen in Stockwell and Minkova's (2001: 13) distinction between syntactic and lexical compounds. In their view, syntactic compounds are formed by regular rules of grammar, like sentences, and their meaning can always be figured out, while lexical compounds have to be looked up in a dictionary since their meaning cannot be figured out just from the rules of grammar. Besides canonical examples of compounds like *shoemaker*, *washing machine*, *candlelight*, *birdcage* or *playgoer*, they cite *quartet playing* in *Quartet playing is fun* (as an alternative formulation to *Playing quartets is fun*) as an example of syntactic compound. This implies that many cases that would be regarded as phrases by other scholars are considered a specific type of compound by these authors. On the other hand, lexical compounds would be cases like *ice cream*, *crybaby*, *girlfriend*, *sweetheart*, *highlight* or *bull's eye*, since their meaning is not transparent. A reason for this morphological approach to all noun plus noun combinations seems to be that some linguists are reluctant to analyse nouns as modifiers within a phrase. Consequently, they do not distinguish structurally between noun-noun compounds and phrases with pre-modifier nouns.

The opposite approach is that of proponents of a syntactic view of noun-noun combinations. For them the very productive class of noun-noun compounds in particular is the output of a syntactic rule, schematised below (Plag 2003: 159 ff.):

NP → article {adjective, noun} noun

This rule states that a noun phrase may consist of an article, an adjective, and a noun, or an article, a noun, and a noun.

The main argument in favour of this syntactic approach is that several of the syntactic criteria which are frequently used to distinguish compounds from free combinations have been shown to fail (Bauer 1998: 77). For example, *public lending right* is possible in English, although it is usually claimed that adjectival modification of the first member of a compound cannot occur; it is also possible to say *cat and dog shows*, although compounds are assumed not to permit coordination. In addition, it is not always the case that they are referentially opaque (e.g. So, I hear you're a real *cat-lover*. *How many* do you have now?) and that they do not allow replacement of the head noun by *one* (e.g. He wanted a riding *horse*, as neither of the carriage *ones* would suffice). In view of this, Bauer concludes that the criteria which are usually assumed to distinguish between these compounds and phrases do not allow us to draw a clear and consistent distinction between a morphological and a syntactic construction. The process by which a

noun phrase consisting of a head noun and a pre-modifying noun is formed is probably similar to the process of noun-noun compound formation, although noun-noun compounds have made their way into the lexicon and are then subject to semantic change:

[...] it is claimed that the criteria to which reference is generally made do not allow us to distinguish between a class of noun + noun compounds and a class of noun + noun syntactic constructions. Rather the two should be treated as *variants of a single construction* (possibly morphological, possibly syntactic), at least until such time as a suitable coherent distinction can be properly motivated. (Bauer 1998: 1) (emphasis mine)

The difficulty in drawing the boundaries between noun plus noun compounds and noun phrases consisting of a pre-modifying noun and a head noun is then a consequence of the fact that the distinction is not clear-cut. However, not all cases of noun plus noun combinations must be regarded as compounds nor is it adequate to deny the existence of noun plus noun compounds and explain all cases by means of syntactic rules. Both noun-noun compounds and phrases with pre-modifier nouns exist but there is a grey area in between full of borderline or unclear cases formed by novel combinations.

Bauer (1998: 81) points out that what we have are two distinct categories which are prototypical categories. This would explain why the criteria used to draw the distinction between phrases and compounds work in some cases, most prototypical cases. Thus, **ice and custard creams* is not possible because *ice-cream* is a lexicalized compound. However, the coordination of *theatre* and *cinema* in *theatre and cinema goers* sounds perfectly alright, since the meaning of the compounds *theatre goer* and *cinema goer* is compositional and can be predicted. Less prototypical cases are then half-way between phrases and compounds: they are created by the same process that creates phrases and the semantic relations involved may be exactly the same in both cases.

As the process by which phrases and compounds are created is the same as well as the semantic relations denoted, the aim of the present paper will be noun-noun sequences, no matter whether some authors consider them as phrases or compounds or whether a combination created as a phrase eventually becomes a compound.

3. NOUN-NOUN SEQUENCES AND SEMANTIC RELATIONS

Different scholars have proposed taxonomic lists of types of semantic relations between compound members. For example, Jespersen (1961: 142-145) made an attempt to classify concrete noun-noun compounds and distinguished different groups of compounds in which the first element denotes any of the following

relations: the place where the second is located (e.g. *garden-party*), what the second is meant for (e.g. *keyhole*), a tool or instrument by means of which the second is brought about (e.g. *gunshot*), something contained in the second (e.g. *mountain-range*), or the material out of which the second is made (e.g. *stone wall*). However, he concludes by saying that “the number of possible logical relations between the two elements is endless”, so that “the analysis of the possible sense-relations can never be exhaustive” (138, 143).

Other linguists have provided similar semantic classifications. Marchand (1969: 45-52), for example, establishes different groups on a syntactic rather than semantic basis, although each set covers different semantic groups: (i) The Subject type: e.g. *bulldog* ('B is like A'), *sugar loaf* ('B consists, is made up of A'), *arm chair* ('B has, possesses, contains A'), etc; (ii) The Object type: Affected object, e.g. *steamboat* ('A operates B'), etc, Effected object, e.g. *beet sugar* ('A produces B'), etc; (iii) The Adverbial Complement type: e.g. *corn belt* ('A grows in B'), etc. In a similar fashion to Jespersen, Marchand concludes that “it is no use trying to exhaust the possibilities of relationship; many compounds defy an indisputable analysis” (Marchand 1969: 22).

Adams (1973: 61) offers a rather rich taxonomic list of types of semantic relations obtaining between compound members, like Appositional, Associative, Instrumental, Locative, Resemblance, Composition/Form, Contents, Adjective-Noun, Names, and a mysterious category that she refers to as “Other”. Although she includes a very large amount of data as examples of her categories, there is no systematic organization to it.

Levi (1978) identifies nine “recoverably deletable predicates”, that is, relationships which any noun-noun compound can potentially embody: CAUSE, HAVE, MAKE, USE, BE, IN, FOR, FROM, and ABOUT. However, she admits that her predicates are so abstract that there is sometimes no way to decide which of the predicates a given form is derived from.

Warren (1978) is probably the most complete descriptive treatment of noun-noun compounds. It is based on a systematic analysis of a large corpus, which allows her to make predictions about the relative frequencies of the different types of compounds.

Adams' (2001: 82-86) sets coincide to a large extent with those established by Levi (1978).

The problem of these and similar attempts at classification is that they rely on rather loosely defined distinctions. For example, the concept “source” may have different meanings depending on the entities involved. In addition, the number of semantic features characterizing the nouns is not limited to one, which means that the relationship between them is not expressible by a single verb, though in real use there will only be one actual meaning.

The lack of agreement on an exhaustive list of relations has led some authors to disregard the relevance of such taxonomies. Plag (2003: 148), for example, argues that “given the proliferation and arbitrariness of possible semantic categories [...] such semantically based taxonomies appear somewhat futile”, so that “what is more promising is to ask what kinds of interpretations are in principle possible, given a certain compound”.

It is clear then that taxonomies should be avoided and interpretation should be given priority. However, the difficulty in reaching consensus on the number of possible relations as well as the lack of exhaustiveness has made some scholars deny the linguistic relevance of some noun-noun sequences.

Selkirk (1982), for example, draws a distinction between verbal and nonverbal compounds. The author defines verbal noun compounds as “endocentric noun [...] compounds whose head [...] noun is morphologically complex, having been derived from a verb, and whose non-head constituent is interpreted as an argument of the head [...]” (23). By “argument” Selkirk means “an element bearing a thematic relation such as Agent, Theme, Goal, Source, Instrument, etc to the head”. Some examples of verbal compounds would be *wine-drinker*, *housecleaning* and *church goer*. On the other hand, nonverbal compounds are those in which the non-heads “add a locative, manner, or temporal specification to the head, but would not be said to bear a thematic relation to, or satisfy the argument structure of, the head” (24). For example, *party drinker*, *spring-cleaning* or *concert singer* are nonverbal compounds. As regards this second type of compounds, Selkirk argues that “the range of possible semantic relations between the head and the non-head is so broad and ill defined as to defy any attempt to characterize all or even a majority of the cases” and that “it is a mistake to attempt to characterize the grammar or the semantics of non verbal compounds in any way” (25). In her view, the only compounds whose interpretation appears to be of linguistic interest are the set of verbal compounds.

However, Selkirk misses an important fact: non verbal compounds are a very productive class that are created and interpreted by speakers too frequently as to deny their linguistic relevance. As a matter of fact, only a minority of nouns are likely candidates to be the head of verbal compounds, that is, only a few nouns take one or more arguments, which is related to the fact that nouns typically perform different roles from verbs within the clause. Speakers are, nevertheless, able to create and interpret noun plus noun combinations containing a second non-derived noun in the same way as those with a second derived noun, as the examples in (1) illustrate (Costello and Keane 2000: 303):

- (1) *Street knife*: an easily concealed knife used by muggers and petty criminals.
Street flower: a small weed that grows through cracks in the pavement.
Street brush: a wide tough brush that street-sweepers use.

People are able to interpret all these combinations using different knowledge about the concept street and the concepts with which it combines. What matters in all these combinations is not that one of the nouns functions as an argument of the other or not but the fact that speakers create and are able to interpret all these combinations easily. Therefore, they are equally relevant from a linguistic point of view.

In a similar vein to Selkirk, Downing (1975, 1977: 839, 841) claims that some kinds of facts underlying compounding need not be included into the grammar, because they derive from cultural values associated with different entities and from the fact that speakers code what they regard as salient in a given context. Unlike traditional treatments, Downing based her work on novel compounds and non-lexicalized established compounds. In her view, context and pragmatic and discourse factors may determine some constraints and preferences in compounding, so that these cannot be captured by the categories proposed in linguistic studies. She declares that “the appropriateness of a given relationship in a given context depends on the semantic class of the head noun, the predictability of the relationship, and the permanence of the relationship” (1977: 828).

The suggestion put forward by Selkirk, and also implicitly by Downing, that some noun-noun compounds are linguistically irrelevant should be taken with care. Whereas the goal in traditional treatments had been to describe patterns found in established sequences, the goal should now be to attempt to predict the interpretation for novel sequences. If the emphasis should be on interpretation rather than on trying to confine sequences to the labels of ready-made taxonomies, any sequence that is used and can be interpreted is linguistically relevant.

4. NOUN-NOUN SEQUENCES AND CONCEPTUAL RELATIONS

In this section it will be argued that conceptual relations play a primary role when two nouns are combined in a sequence. By means of a corpus search it will be shown that there are different types of conceptual relations holding between the two nouns in a sequence, depending on the semantics of the nouns involved.

4.1. INTRODUCTION

Noun-Noun sequences are interpreted in terms of the typical relations linking the two nouns. The different types of relations denoted are usually connected to the distinction between two semantic types of head noun: relational versus non-relational or sortal nouns (Fillmore 1968: 61ff., Plag 2003: 148ff., Keizer 2007: 218ff.). Relational nouns denote relations between a specific entity and another conceptually necessary entity. For example, the entity denoted by *poetry* is closely

related to the concept denoted by the relational noun *writer*. On the other hand, non-relational or sortal nouns denote an entity which is not necessarily related to any other particular entity, that is, when these nouns are combined with another noun, the concept denoted by this noun is not required for the expression to be meaningful. Examples of non-relational nouns would be *man* or *table*.

Many relational nouns are derived from verbs or adjectives and they inherit their argument structure. For example, *writer* is derived from *write* and has an argument with the semantic function of Result. Relational nouns can therefore be compared to verbs since they have an argument structure and impose restrictions on the number, semantic roles and semantic features of their arguments. Consequently, the conceptual relation linking the two nouns in these cases is made explicit through the presence of the verbal element.

Other relational nouns are basic. For example, *surgery* is closely connected with the entity affected by the action denoted, so that the first nouns in sequences with *surgery* are normally interpreted as the entity affected by the action of the second noun (e.g. *brain surgery*). The conceptual relation linking the two nouns is not explicit in these cases, although it is also easily activated.

Finally, non-relational nouns would, in principle, pose more difficulties for interpretation in noun-noun sequences, since the relationship linking these nouns with other nouns in a sequence has to be chosen from a number of equally possible options. For example, *computer man* might be interpreted as “a man that works with computers”, “a man that sits by a computer”, “a man keen on computers”, “a man appearing on the computer screen”, and the like.

The various semantic compounding relationships have also been suggested to depend on the semantic class of the head member of the compound, that is, the type of entity denoted, as advanced by Downing (1977: 829). She divides the compounds considered in her paper into five groups (human, animal, plant, natural object, synthetic object) and she offers the most frequent interpretation for the resulting compounds in order to show that “relationships which are of classificatory relevance with respect to one type of entity appear to be irrelevant with respect to another, [...]”. For example, she remarks that “naturally existing entities (plants, animals, and natural objects) are typically classified, at least in our culture, on the basis of inherent characteristics; but synthetic objects are categorized in terms of the uses to which they may be put” (831). Downing only incorporates one semantic type of entity, since human, animal, plant, natural object and synthetic object are all subtypes of first order entities, which Lyons (1977: 443) defined as those entities that are “relatively constant as to their perceptual properties”, that “are located [...] in a three-dimensional space”, “are publicly observable”, “may be referred to, and properties may be ascribed to them [...]”.

Drawing partially on Downing, the aim of the following section is to develop

her suggestion by extending the analysis to second order entities, defined by Lyons as “events, processes, states-of-affairs, etc, which are located in time and which, in English, are said to occur or take place”, and to places (for a discussion on the distinction between first order entities and places, see Mackenzie 1992). Additionally, the distinction between relational and non-relational nouns will be considered.

I wish to put forward the suggestion that corpus research on the noun-noun sequences in which different semantic types of nouns occur may cast some light on conceptual combination. In order to show the possible conceptual relations between the two nouns in a sequence, the results from a corpus search of the most frequent sequences with a set of different nouns will be offered.² Specifically, the nouns *shopping*, *surgery*, *table* and *corner* have been searched and 200 noun-noun sequences have been analysed (the 50 most frequent sequences with each search noun). The choice of these nouns was justified by the fact that they denote different types of entities, namely second order entities (*shopping* and *surgery*), a first order entity (*table*) and a place (*corner*). In addition, most of these nouns are relational (*shopping*, *surgery*, *corner*), while *table* is non-relational. This variety will allow drawing some conclusions on the interaction between the semantic type of the noun (either in terms of the distinction between relational and sortal nouns, or in terms of the different entity types denoted) and the likelihood to combine with certain other nouns. This sample is intended to serve as an illustration of the kind of survey that can be done on a larger scale to draw generalizations on conceptual combination.

4.2. CORPUS RESULTS AND DISCUSSION OF N-N SEQUENCES WITH SHOPPING

In this section, combinations in which *shopping* appears in second position in a noun-noun sequence will be analysed. The corpus results with *shopping* are given in Table 1.

All these combinations of noun plus noun contain the same second noun *shopping*, which denotes the act of going to shops and buying things. This meaning makes it possible for this noun to combine with a number of other nouns whose meaning is relevant to that denoted by *shopping* in some way.

To start with, *food shopping* denotes “the action of going to shops and buying food”. In this case, the noun *food* may be seen as satisfying an argument position of the second noun, in spite of the fact that the verb from which *shopping* is derived is usually intransitive (or takes a prepositional object headed by *for*).

² The Corpus of Contemporary American English (henceforth COCA) (Davies 2008-) has been used. This corpus allows sorting the results by raw frequency (the default sorting), where the most frequent results appear first.

Table 1. *Top 50 most frequent sequences with SHOPPING*

GROCERY SHOPPING	Location	326	DOCTOR SHOPPING	Theme	13
HOLIDAY SHOPPING	Time	248	CATALOG SHOPPING	Means	12
CHRISTMAS SHOPPING	Time	226	MALL SHOPPING	Location	12
HOME SHOPPING	Location	224	SHOE SHOPPING	Theme	12
COMPARISON SHOPPING	Other ³	113	WEB SHOPPING	Means	12
STRIP SHOPPING	Location	63	BOUTIQUE SHOPPING	Location	10
WINDOW SHOPPING	Means	63	CENTER SHOPPING	Location	10
FOOD SHOPPING	Theme	54	GIFT SHOPPING	Theme	10
STREET SHOPPING	Location	26	PRICE SHOPPING	Other	10
TV SHOPPING	Means	26	HOUSEHOLD SHOPPING	Purpose	9
PLAZA SHOPPING	Location	25	MYSTERY SHOPPING	N ₂ is N ₁	9
INTERNET SHOPPING	Means	24	BARGAIN SHOPPING	Theme	8
TELEVISION SHOPPING	Means	23	FORUM SHOPPING	Theme	8
CAR SHOPPING	Theme	22	OAKS SHOPPING	Theme	8
NEIGHBORHOOD SHOPPING	Location	22	PARK SHOPPING	Location	8
CLOTHES SHOPPING	Theme	21	SOUVENIR SHOPPING	Theme	8
SQUARE SHOPPING	Location	20	AVENUE SHOPPING	Location	7
UPSCALE SHOPPING	N ₂ is N ₁	20	AREA SHOPPING	Location	7
OUTLET SHOPPING	Location	19	COMPUTER SHOPPING	Means	7
STOP SHOPPING	Other	15	DIAMOND SHOPPING	Theme	7
VILLAGE SHOPPING	Location	15	FURNITURE SHOPPING	Theme	7
DISCOUNT SHOPPING	Other	14	IMPULSE SHOPPING	Other	7
SIDEBAR SHOPPING	Location	14	POWER SHOPPING	Other	7
SUPERMARKET SHOPPING	Location	14	CATALOGUE SHOPPING	Means	6
CITY SHOPPING	Location	13	CLOTH SHOPPING	Theme	6

This example provides illustration that a relevant factor in noun plus noun combinations is thematic relations, i.e. relations in which the non-head constituent is interpreted as an argument of the head and denotes participant roles like Agent, Theme, Goal, Result, Patient, and the like. Thematic relations are relevant with combinations containing a derived relational head or verbal head, though the expression of thematic relations is not exclusive to them.

³ In a few cases where the adverbial relation denoted is not clearly identifiable the label “Other” has been used.

However, most of the other sequences with *shopping* are different from this one. For example, *strip shopping* is “the shopping at a commercially developed area, especially along a highway”. *Strip* designates a Location and, therefore, the association that links this noun to *shopping* is adverbial-like. A similar case is *Christmas shopping*. This combination refers to “the kind of shopping typically done at Christmas time”. As *shopping* designates an event both the Location and the Time where this takes place are classificatory properties and hence, the combination is a conceptually natural one and its interpretation is easily activated. Sequences with *shopping* may also refer to the Means through which the shopping is done. For example, *web shopping* denotes “a type of shopping by which some goods are purchased on the Web”.

In the light of the corpus data, it can be established that there are two main types of relations that the first noun in sequences with *shopping* expresses, namely thematic relations and adverbial type relations, of which the latter type is predominant. The frequency score and percentage of these two types of conceptual relation found with *shopping* are given in Table 2 below:

Table 2. *Percentage of thematic versus adverbial relations in noun-noun sequences with SHOPPING*

	Thematic relations	Adverbial relations
Frequency score	184	6597
Percentage	2.70%	96.87%

We can also encounter cases like *upscale shopping*, where the first noun denotes a property of the second noun (in this case, “the shopping is upscale”), although examples like this one are scarce. Additionally, it is possible for the first noun to denote a descriptive characteristic in terms of which both concepts are compared (Clark and Clark 1977, Ryder 1994: 78). For example, *marathon shopping* (attested in the corpus, though not included among the 50 most frequent cases) might refer to “a kind of shopping that shares features with marathons” (for example, speed of the action).

Finally, resorting to context is necessary in cases like *price shopping* or *power shopping*, where it is only by reading the surrounding co-text that an interpretation can be activated (see section 6).

Summing up, different possible associations are found with *shopping*. On the one hand, there are cases like *food shopping*, where one noun satisfies an argument slot of the argument structure of the other and that can be regarded as thematic-relation associations. On the other hand, another more frequent type of association covers cases where one noun denotes an adverbial relation like

Location (e.g. *strip shopping*), Time (e.g. *Christmas shopping*), Means (e.g. *web shopping*), and the like. Finally, there are few cases of associations of the type 'N₂ is (like) N₁' (e.g. *upscale shopping*) or where N₁ denotes a property of N₂ (e.g. *marathon shopping*). Therefore, in spite of being a derived relational noun, the noun *shopping* does not combine more frequently with nouns satisfying an argument slot but with a different type of conceptual relation. This results from the fact that *shopping* is a noun denoting a second order entity, which are located in time and are said to occur or take place. Thus *shopping* (and second order entity denoting nouns) can be classified by the Location where they take place, the Time when they happen, or the participants involved (e.g. *food shopping*), among other features.

4.3. CORPUS RESULTS AND DISCUSSION OF N-N SEQUENCES WITH SURGERY

In this section, sequences of two nouns which *surgery* in second position will be analysed. The corpus results with *surgery* are given in Table 3.

Table 3. *Top 50 most frequent sequences with SURGERY*

KNEE SURGERY	Theme	474	WRIST SURGERY	Theme	26
BYPASS SURGERY	Purpose	405	ANKLE SURGERY	Theme	25
HEART SURGERY	Theme	394	OUTPATIENT SURGERY	Theme	25
BRAIN SURGERY	Theme	317	HERNIA SURGERY	Purpose	23
LASER SURGERY	Means	172	BLADDER SURGERY	Theme	21
NECK SURGERY	Theme	169	PLACEBO SURGERY	N ₂ is N ₁	21
SHOULDER SURGERY	Theme	158	REASSIGNMENT SURGERY	Purpose	21
ELBOW SURGERY	Theme	123	LASIK SURGERY	Means	20
CANCER SURGERY	Purpose	123	STAPES SURGERY	Theme	20
BACK SURGERY	Theme	122	HAND SURGERY	Theme	18
EMERGENCY SURGERY	N ₂ is N ₁	118	OFFSEASON SURGERY	Time	17
EYE SURGERY	Theme	112	ROUTINE SURGERY	N ₂ is N ₁	16
SINUS SURGERY	Theme	110	SPINE SURGERY	Theme	15
REPLACEMENT SURGERY	Purpose	96	FUSIONSURGERY	Theme	14
TRANSPLANT SURGERY	Purpose	66	GALLBLADDER SURGERY	Theme	13
BREAST SURGERY	Theme	58	CUFF SURGERY	Theme	12
CATARACT SURGERY	Purpose	52	THROAT SURGERY	Theme	12

EAR SURGERY	Theme	47	ARTERY SURGERY	Theme	10
PROSTATE SURGERY	Theme	45	COLON SURGERY	Theme	10
REVISION SURGERY	Purpose	43	SKIN SURGERY	Theme	10
FOOT SURGERY	Theme	40	LUNG SURGERY	Theme	9
EYELID SURGERY	Theme	35	SEPARATION SURGERY	Purpose	9
HIP SURGERY	Theme	33	STOMACH SURGERY	Theme	9
IMPLANT SURGERY	Purpose	27	CORD SURGERY	Theme	8
VALVE SURGERY	Purpose	26	ARM SURGERY	Theme	8

The corpus data show a predictable fact about *surgery*. This noun is relational and, therefore, it is closely associated to another concept. In particular, the use of *surgery* generally causes the activation of the entity on which the action denoted by this noun is performed, that is, the affected entity and, in fact, sequences like *knee surgery* display the highest frequency score overall. In cases like this one, the first noun can be seen as the argument of the second noun, in spite of the fact that *surgery* is not a deverbal noun.

However, additionally, *surgery* also combines quite easily with other nouns denoting adverbial type relations, such as the Purpose of the action (e.g. *replacement surgery*) or the Means by which the action denoted by this noun is performed (e.g. *laser surgery*). Besides, *surgery* resembles *shopping* in the denotation of a second order entity and the possibility to combine with a noun denoting Time, as the sequence *offseason surgery* shows. Cases like this one are not relevant with *surgery*, though, as this is the only example found.

The frequency score and percentage of these two main types of conceptual relation found with *surgery* are given in Table 4 below:

Table 4. *Percentage of thematic versus adverbial relations in noun-noun sequences with SURGERY*

	Thematic relations	Adverbial relations
Frequency score	2490	1100
Percentage	66.48%	29.37%

Finally, some marginal cases like those found with *shopping*, which can be interpreted as N_2 is N_1 , are also found (e.g. *routine surgery*).

4.4. CORPUS RESULTS AND DISCUSSION OF NOUN-NOUN SEQUENCES WITH TABLE

The results of the corpus search with the noun *table* are given in Table 5 below.

Table 5. Top 50 most frequent sequences with TABLE

KITCHEN TABLE	Location	2541	DRAFTING TABLE	Purpose	82
COFFEE TABLE	Purpose	1631	GLASS TABLE	Composition	81
DINNER TABLE	Location	1060	HEAD TABLE	N_2 is N_1	78
ROOM TABLE	Location	636	TEA TABLE	Purpose	75
DINING TABLE	Purpose	560	LUNCH TABLE	Purpose	73
BEDSIDE TABLE	Location	462	EXAMINATION TABLE	Purpose	71
PICNIC TABLE	Purpose	425	FORMICA TABLE	Composition	69
CONFERENCE TABLE	Purpose	424	METAL TABLE	Composition	69
NEGOTIATING TABLE	Purpose	381	HALL TABLE	Location	64
POOL TABLE	Purpose	377	ROUTER TABLE	Part-Whole	63
BREAKFAST TABLE	Purpose	370	SUPPER TABLE	Purpose	63
CARD TABLE	Purpose	322	WRITING TABLE	Purpose	60
NIGHT TABLE	Time	284	MAHOGANY TABLE	Composition	58
DRESSING TABLE	Purpose	262	BLACKJACK TABLE	Composition Purpose	56
OPERATING TABLE	Purpose	244	POKER TABLE	Purpose	56
SIDE TABLE	Location	234	BUREAU TABLE	Part-Whole	52
BARGAINING TABLE	Purpose	202	COCKTAIL TABLE	Purpose	52
END TABLE	Location	199	PINE TABLE	Composition	52
DINING-ROOM TABLE	Location	175	TRAY TABLE	N_2 is N_1	52
BUFFET TABLE	Purpose	162	WOOD TABLE	Composition	50
CORNER TABLE	Location	162	FAMILY TABLE	Purpose/Size	49
DEFENSE TABLE	Purpose	136	DRAWING TABLE	Purpose	48
OAK TABLE	Composition	108	PATIO TABLE	Location	48
WORK TABLE	Purpose	99	BANQUET TABLE	Purpose	47
PEACE TABLE	Purpose	88	CRAPS TABLE	Purpose	46

The majority of nouns in sequences with *table* denote either Purpose or Location, while in a small number of cases the denotation is Composition and in still fewer cases it is Part-Whole. Additionally, there are some examples where the sequence can be interpreted as “N₂ is N₁”.

As can be seen, the first noun in sequences with *table* only expresses adverbial type relations. These findings are not surprising, since *table* denotes a first order entity, more specifically, a synthetic object, which are typically created with some goal in mind and are categorized in terms of their Purpose (e.g. *picnic table*), the Location they occupy (e.g. *bedside table*) or their Composition (e.g. *oak table*) (see Downing 1977: 830-831).

As compared to the nouns *shopping* and *surgery*, the denotation of the first noun in sequences with *table* is not semantically compatible with argument status. However, this is not a generalization for all nouns denoting first order entities. Other first order entities like human beings are often categorized in terms of the occupation they are involved in. Thus when a noun denoting a human entity is deverbal, it is common for this noun to combine with other noun satisfying an argument slot, that is, expressing a thematic relation, resulting in sequences like *poetry writer*. The expression of thematic relations can also be extended to cases in which the noun is non-relational. For example, a *garbage man* is interpreted as “a man that collects garbage”, that is, as a *garbage collector*; where the first noun is understood as an argument of the second, although the verbal association linking both nouns is not made explicit in the sequence.

4.5. CORPUS RESULTS AND DISCUSSION OF NOUN-NOUN SEQUENCES WITH CORNER

In this section, combinations in which *corner* is combined with other nouns are considered. In this case, the search noun is placed in first position, so that the influence of the semantics of the noun can be checked in the opposite direction, that is, from the first noun to the second one. The results from the corpus search are given in Table 6.

All these combinations contain the same first noun *corner*, which denotes “a place angle formed by the meeting of two converging lines or surfaces”, “the space within the angles formed, as in a room” or “the place where two streets meet”. This meaning makes it possible for this noun to combine with a number of other nouns for which the meaning denoted by *corner* is relevant in some way. This means that not only the concept denoted by the head noun but also the semantic class of the first noun are relevant factors to be considered in noun plus noun combinations.

In the case of *corner*, the corpus data reveal that the majority of sequences are similar to *corner shop* or *corner table*, that is, the most likely combinations with

Table 6. *Top 50 most frequent sequences with CORNER*

CORNER OFFICE	Place	239	CORNER APARTMENT	Place	16
CORNER STORE	Place	177	CORNER CHAIR	Object	15
CORNER TABLE	Object	162	CORNER DELI	Place	15
CORNER GROCERY	Place	49	CORNER SUITE	Place	14
CORNER LOT	Object	46	CORNER FITTINGS	Object	13
CORNER BOOTH	Object	44	CORNER GAS STATION	Place	12
CORNER ROOM	Place	44	CORNER RESTAURANT	Place	12
CORNER CUPBOARD	Object	35	CORNER KICK	Action	11
CORNER POSTS	Object	35	CORNER KICKS	Action	11
CORNER BAR	Place	34	CORNER BAKERY	Place	10
CORNER STORES	Place	30	CORNER STONE	Object	10
CORNER CAFÉ	Place	28	CORNER STUDS	Object	10
CORNER DRUGSTORE	Place	27	CORNER GROCERIES	Place	9
CORNER POCKET	Place	27	CORNER SEAT	Object	9
CORNER HOUSE	Place	26	CORNER TAVERN	Place	9
CORNER SHOP	Place	23	CORNER DESK	Object	8
CORNER WINDOW	Object	23	CORNER JOINTS	Object	8
CORNER CABINET	Place	21	CORNER MAN	Human	8
CORNER CENTER	Place	21	CORNER SHELF	Object	8
CORNER MARKET	Place	20	CORNER PIECE	Object	7
CORNER OFFICES	Place	20	CORNER SHOPS	Place	7
CORNER POST	Object	20	CORNER BRACKETS	Object	6
CORNER BLOCKS	Object	19	CORNER BODEGA	Place	6
CORNER BUILDING	Object	17	CORNER GROCER	Human	6
CORNER PUB	Place	17	CORNER LIQUOR STORE	Place	6

corner are nouns denoting objects or places specifically designed to be used as the setting for certain kinds of activities (for example, *shops* are created to sell goods).

Corner shop is defined as “a small shop, especially on a corner of a road, which sells common foods and other objects that are useful in the house”. *Corner* designates a position or place and this is a property of shops, which can be classified not only in terms of the goods sold but also in terms of the place where

they can be found (cf. *airport shop* or *high street shop*). Therefore, the combination *corner shop*, though not completely transparent nowadays (since there are corner shops that are not situated on corners), was based, at least in its origin, on a possible natural conceptual relationship between both concepts, so that both concepts are closely associated and the correct interpretation is easy to achieve.

A similar case is *corner table*. This combination refers to a class of tables that are specifically designed to be placed in the corner of a room. Being a piece of furniture as they are, tables are decorative objects with specific physical properties (shape, size, composition, etc), placed on specific locations and which have been created with a given purpose. Since Location is a classificatory property of furniture, the combination of *corner* and *table* is a conceptually natural one. Consequently, the first noun creates some expectancies about the types of nouns that can follow in a sequence, because it denotes one of the cognitively important features that can be used to characterize the head noun, that is, an object. A noun denoting Location is, however, not expected to appear in combination with another noun denoting a personal entity. In this respect, Quirk et al. (1985: 1331) point out that while a phrase like *the table for the corner* could yield *the corner table*, a similar phrase like *the man in the corner* cannot yield *the corner man*.

4.6. CONCLUSIONS

The examination of the corpus data reveals that conceptual relations are primary when two nouns are combined in a sequence. For one thing, the type of entity denoted by the head noun will determine which combinations are cognitively more natural with it. Likewise, the semantics of the first noun creates expectancies on the types of nouns with which it is more likely to combine. Conceptual relations linking the two nouns in a sequence vary from thematic relations to other types of relation, like adverbial relations. The distinction between relational or non-relational nouns is not relevant, however, since relational nouns are not exclusively combined with nouns expressing thematic relations. Thus the first noun in sequences with *shopping* or *surgery* is, in many cases, semantically not compatible with argument status: most of the nouns with *shopping*, for example, do not denote participants functionally related to the head but adverbial features like Location, Time, Means or Purpose. In addition, not only relational but also non-relational nouns show preferences to combine with (and are therefore closely related to) other specific nouns. As an example of this, the noun *table* has been shown to have specific preferences to combine with other nouns denoting either Location, Purpose, or Composition.

To sum up, in isolation, noun-noun sequences are created and interpreted following the cognitively salient relations linking the two nouns. However, the remainder of this article will be devoted to show that, in addition to conceptual

relations, there are further factors to consider in conceptual combination. In fact, sequences like *corner man* have been found among the corpus results. This example is remarkable in that it does not instantiate cognitively salient relations between the concepts denoted by each noun. The occurrence of sequences like this one entails that there must be intervening factors different from conceptual relations when two nouns are combined in a sequence, as already advanced by different scholars (Downing 1975, 1977, Levi 1978).

5. NOUN-NOUN SEQUENCES AND CONTEXT

In the lines above it has been argued that conceptual relations are crucial in the creation and interpretation of noun-noun sequences. However, the use of a noun-noun sequence or the activation of the appropriate interpretation might be dependent on the particular context.

There are four different ways in which context may be seen as having an influence on the interpretation of a noun plus noun combination.

Firstly, our knowledge of the world can be a relevant factor to create and interpret a sequence of two nouns. Several scholars agree that the fact that a given combination expresses one of the typical relationships is not sufficient to guarantee the right interpretation since these semantic relations leave out of account most of the specific knowledge required, that is, world knowledge (see Downing 1977, Levi 1978, Adams 2001). Conversely, a given noun-noun sequence might not illustrate the typical relation between the nouns involved. As Adams (2001: 86) remarks, “in most circumstances, compounds [...] are easy to invent, use and understand because they name entities in culturally relevant ways”.

The kind of world knowledge required to derive an interpretation can be very specific sometimes. As an example of this, consider *corner man*. *Corner man* is attested in the corpus and it is also listed in some dictionaries. However, Quirk *et al.* (1985) mention it as an impossible combination, which is probably connected with the fact that it belongs to a sports context, and to a quite specific sport: a *cornerman*, or simply *corner*, is a combat sports term for “a coach or team mate assisting a fighter during the length of a bout”.

Similar examples are *corner girl* (not included in the corpus, though it is attested), *corner grocer* or *corner drug dealer*, both attested in the corpus. A *corner girl* is a prostitute, while *corner grocers* and *corner drug dealers* are groceries and drug sellers, respectively. In cases like these, it is our knowledge of the world that licenses these noun plus noun combinations since we all know that corners are the place where prostitutes work and also the place where groceries and drug are sold, at least prototypically.

Likewise, *corner* could be combined with actions typically carried out in this location, like selling drug, drinking or kicking a ball. Thus, examples like *corner drug selling*, *corner drinking* or *corner kick* are also attested, in spite of being more marginal cases than those in which the second noun denotes a place or an object.

Almost any noun is likely to appear in atypical sequences. Further evidence of the role of world-knowledge in noun-noun sequences is provided by the sequence *night table*, where *night* cannot be regarded as expressing a cognitively salient property of tables but can be easily interpreted since it is common in our culture to have tables beside our beds to use at night.

In short, given the appropriate context, any noun could be combined with a variety of different nouns other than the expected ones.

Secondly, noun-noun sequences are a good example of the dynamic construction and interpretation of linguistic expressions. Thus, although a noun-noun combination may normally have a particular meaning, it might have a different one under certain conditions. For example, *holiday shopping* refers to the type of shopping done at Christmas time in the corpus examples, which are similar to that shown in (2):

(2) There are more consumers waiting to finish their *holiday shopping* on Dec. 24 than any other time in the last five years (COCA, USA Today 2004)

However, provided the appropriate context, this sequence might be interpreted differently. For example, in a text dealing with different means for buying holidays, example (3) could be found:

(3) Many of us will do *holiday shopping* on the Internet this year

In this case, *holiday* could be seen as satisfying an argument position of *shopping*, that is, that which is bought.

As a different example, *corner* could be found in less predictable combinations than those attested in the corpus, like *corner brush*. A *corner brush* is “a brush designed to clean corners, crevices, and other hard-to-reach areas”, where *corner* does not express the typical relation found with this noun. This would be the most natural meaning for *corner brush*, as a cognitively salient property of synthetic objects is their purpose. In this case, a brush is used to clean some surface. In an advertisement about a new cleaning instrument (where the example was found) this interpretation will be kept since there is no clash between the context and the salient relation conveyed by *brush*. However, in a context where the hearer should differentiate between different brushes and pick up the one in the corner,

the same combination of two nouns might have to be interpreted differently, as “brush placed in the corner”.

This means that the decision of which features will match the two nouns may occur in an online fashion since the interpretation of *corner brush* largely depends on the surrounding discourse. Although certain relations seen in compounds are privileged, the context overrides the out-of-context meaning and dictates which interpretation is more appropriate (Levi 1978, Gagné *et al.* 2005).

A related effect of context in the online interpretation of a noun plus noun combination was examined by Wisniewski and Love (1998: 197). In their study on the use of relations versus properties in conceptual combination the authors found that prior use of a property versus a relation interpretation strategy increased its subsequent use. For example, after interpreting *knife chisel* as “very sharp chisel”, that is, using a property interpretation, subjects tended to interpret a combination like *book magazine* using a property of the first noun, as in “a thick magazine” (instead of “a magazine that reviews or sells books”). Similar cases are found in the corpus. Thus, *television shopping* is easily interpreted as “shopping by means of/ on television”, rather than “shopping of televisions”, after other sequences like *Internet shopping* or *home shopping*, where the most likely interpretation would be “shopping by means of/ on the Internet” or “shopping from home”.

The example of *corner brush*, where the sequence is used to refer to a particular entity, that is, “the brush placed in the corner”, brings us to the next case of context conditioning for the use and interpretation of a noun-noun sequence. This use of *corner brush* shows that a noun-noun sequence can refer to some piece of extralinguistic reality, where the sequence is a sort of *deictic* device (Downing 1977: 822).

As a different example, consider the sequence *corner man*. We could think of an appropriate context in which *corner man* would be a felicitous combination with a different denotation from the attested *corner man*. For example, we could imagine a conversational situation in which someone had to identify a man placed at the corner of a church within a group, as shown in (4):

- (4) A: Look at the man!
 B: Which one?
 A: The *corner man*

As Downing points out, these online combinations are based on relationships derived from temporary states of affairs, and are not usable and interpretable from situation to situation but only in the presence of contextual support (the presence of a given referent in the situation that must be distinguished from others licenses the creation of the compound). Most of them do not survive beyond the situation

in which they are created. In addition, they are not long range category labels, i.e. they do not refer to specific subcategories of entities. *Corner man* in the example above does not refer to a class of men in the same way as *corner shop* refers to a specific class of shops.

Furthermore, these combinations are subjected to less severe constraints since they do not exhibit the natural/ dominant relations usually holding between concepts. As mentioned previously, Location is not a cognitively salient property in terms of which human beings are classified.

A different way in which the context has an influence on the interpretation of a noun plus noun combination can be seen in those cases where the primary function of a noun-noun sequence is a discourse referential one. A noun plus noun combination can be used to refer back to some explicit part of the co-text, taking it up again in condensed form, that is, for *anaphoric reference*, as can be seen in example (5):

(5) Elisabeth ordered Catherine to *brush* the floor of the courtyard, being especially careful with *corners* since the wind tended to push all dry leaves there. She got very angry when she came back and saw that the maid had forgotten the *corner-brush* (my own example).

Kastovsky (1982, 1986) points out that the function of compounds in these examples is that of *syntactic recategorization* rather than a lexical, labelling or naming function.

The meaning of a noun plus noun combination may also be explained further by the following co-text. This is particularly important for writing headlines or advertisement texts. Consider in this respect example (6), where it is only the following context that reveals the meaning of the combination.

(6) *Corner men* leave Liverpool exposed
Liverpool's struggle to find quality *full-backs* leaves them looking vulnerable at Chelsea today.
Benitez, such a defensive expert generally, has inexplicable difficulties finding good *men to play on the flanks of his rearguard*
(*The Sunday Times*, 26 October 2008)

In the case of noun plus noun combinations like these, contextual dependence is crucial. Turning to the previous examples: in (5) we need to resort to the previous discourse to get to the right interpretation “the brushing of the corners” and, more importantly, to produce such an online compound. In (6) we have to look at the following co-text to get at the interpretation “full-backs” or “men to play on the flanks of his rearguard”.

Resorting to the previous or following co-text is also required in some sequences attested in the corpus, like *price shopping* or *power shopping*, as examples (7) and (8) illustrate:

(7) The United States forbids wholesalers and retailers from buying drugs at lower prices in other countries. Such *price shopping* is encouraged elsewhere, especially Europe. Great Britain fills one of eight prescriptions with drugs imported from other European countries. If the price of a drug is lower in Spain, for example, Great Britain will import the drug from Spain. (COCA, USA Today 1999)

(8) While many luxury products have entered the consumer mainstream, the idea of luxury has ascended to the level of opulence. It's a movie star concept. Turn on the television or flip through a magazine, and you can see Oscar winners strolling down red carpets in designer gowns and tuxes, or pop-music moguls *power shopping* for clothes, jewels and cars. (COCA, Marion Asnes, *The Affluent American*, Vol. 32, Iss. 13, p. 40, 2003)

While one can probably figure out an interpretation for *price shopping* in the absence of any context, it is only by looking at the accompanying text that the interpretation "shopping at the lowest possible price" is made clear. Other cases like *power shopping* are more context-dependent. As Adams (2001: 88) declares, examples like these illustrate that "a compound guarantees only the fact of a connection in some context of the referents of its components". In agreement with Downing (1977: 828), any model aiming at explaining the compounding process should have to account for the fact that noun-noun compounding is a productive process and that compounding relationships are neither finite nor static, since they vary from context to context.

6. CONCLUDING REMARKS

What has emerged from the examination of noun-noun sequences with *shopping*, *surgery*, *table* and *corner* is that combinations of two nouns reflect different types of conceptual associations existing between the concepts denoted, like thematic relations and adverbial relations. The semantics of the nouns involved will determine some preferences to combine with certain other nouns. More specifically, the type of entity denoted rather than the distinction between relational and non-relational nouns has been shown to be determinant in conceptual combination.

In addition, different types of contextual factors are relevant not only for the creation but also for the correct interpretation of noun-noun sequences as they may trigger conceptual combinations or interpretations other than the expected ones.

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