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A Transitivity Analysis of some Compounds in the Computer Networking Jargon

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Abstract
There have been numerous attempts by linguists to investigate into the ideational function of language. However, most researches concerning transitivity analysis base themselves only on the clause. Scant attention has been paid to compounds, as linguistic devices that can be used to see how the experience of computer networking is represented. This study uses Hallidayan transitivity to analyze some compounds found in computer networking jargon, as most of the words in it are compound nouns. The study aims to identify how language is manipulated by computer networking persons to construe the experience of computer networking. To conduct this study, a sample of 166 was drawn from the population of 262 compounds that were collected from different books on computer networking. The collected compounds were those expressing technical terms of computer networking. The findings reveal that mental processes are not used to construe the experience of computer networking. By contrast, material and relational processes are used to construe the experience of computer networking. These processes are realized in different configurations.

Keywords: **Transitivity**, **compounds, computer networking**

Résumé

La fonction idéationnelle du langage a fait l'objet de plusieurs recherches menées par les linguistes. Cependant, la plus part de recherches sur la transitivité ne se sont basées que sur la proposition, négligeant ainsi les mots composés comme moyens linguistiques pouvant être utilisé pour voir comment l'expérience du réseau informatique est représentée. Cette étude se sert de la transitivité hallidayenne pour analyser quelques noms composés du jargon du réseau informatique, étant donné que la plus part de mots de ce jargon sont des noms composés. Elle cherche à voir comment la langue est manipulée par les ingénieurs du réseau informatique afin de représenter l'expérience du réseau informatique. Pour mener cette étude, un échantillon de 166 mots a été tiré de la population de 262 mots techniques collectés de différents livres du réseau informatique. Les résultats révèlent que le procédé mental n'est pas utilisé dans la représentation de l'expérience du réseau informatique. Par contre les procédés matériels et relationnels sont les plus utilisées dans la représentation de l'expérience dans cette branche de l'informatique. Ces procédés sont construits selon différentes configurations.

Mots clés : Transitivité, mots composés

1. Introduction

This article sets out to investigate into the language of computer networking with the purpose of finding out how language is manipulated to construe the experience of this subfield of computer science. The analysis will be based on some compounds taken from different books of computer networking. The choice of this topic is motivated by the fact most of the words formed in this field are compounds which express technical terms of computer networking. These compounds may cause learning problems to EFL students of computer networking. Besides, most researches on transitivity use only the clause to study the ideational function of language in a given piece of communication. Put differently, there is not any work using compounds as semantic construct in order to see how the experiential function of language is expressed. This study will show that compounds can also be used as linguistic units that can be used to study the

ideational function of language. The focus will be put on the experiential function of language expressed through transitivity. Hopefully, this study can make many contributions to ESP teachers/learners involved in the field of computer networking. Hutchinson and Waters (1987 p.34) stress the importance of language-based analysis as this one by showing that the use of discourse analysis in ESP has been through materials which aim to explain how meaning is created.

2. Review of literature

2.1. Transitivity.

The term *transitivity* is used in different senses. Hartmann and Stork (1972 p.242) define it as those grammatical features which are used systematically to express certain relationships between the participants in a communicative situation and the actions, states or circumstances in which they are involved. Similarly, Crystal (2006 p.494) defines *transitivity* as a category used in the grammatical analysis of clause/sentence constructions, with a particular reference to the verb's relationship to dependent elements of structure. As can be seen, these authors define *transitivity* in the sense of the verbs which must be completed by an object in the sentence or not. It follows that there are verbs which must be used with direct object, indirect object or not. As a consequence, there are transitive verbs and intransitive verbs depending on whether they have an object or not.

In his definition of *transitivity*, Thompson (2014 p.94) stresses the fact that *transitivity* refers to a system for describing the whole clause, rather than just the verb and its object. The term clause is taken here as the grammatical means of encoding patterns of experience. This grammatical unit enables to organize semantically and syntactically the inner and outer experience into a manageable number of representational patterns (or schemas). This fundamental property of language is done though transitivity. It is worth pointing out that this definition fails to show that compounds can also be taken as grammatical means for encoding patterns of experience. This article will show that compounds can express transitivity, and can be used to study the experiential function of language. Before going further, it is worth pointing out that in this article, the term *transitivity* is used in its broadest sense in accordance with Downing and Locke (2006 pp.122-123) who show that *transitivity* encompasses not only the verb, but the semantic configuration of the situation types. Accordingly, *transitivity* can be defined as a tool that enables to conceptualize and describe the experience, whether of the actions and events, people and things of the external world, or of the internal world of the thoughts, feelings and perceptions. To put it in other terms, *transitivity* is a grammatical system for construing the experience of the world around and inside us. This system consists potentially of the following components outlined by Downing and Locke (2006 pp.122-123): (1) a set of process types by which the world of experience is construed, (2) the type of the participants (participation) involved in the process, (3) the circumstances attendant on the process, and (4) the attributes ascribed to the participants.

2.2. Compounds

A *compound* is a word formed by combining at least two free morphemes. To borrow Booij's terms (2007 p.5), in compounding, the constituents of the words are themselves lexemes, which is not the case with derivational mechanism. That is, compounds contain at least two bases that are both words, or at any rate, root morphemes (Katamba and Stonham, 2002 p.55).

Different classifications of compounds have been provided. However, most of these classifications neglect to tackle this issue in the field of Systemic Functional Grammar. That is, there is not any functional classification of compounds as it has been the case with the clause (material clauses, mental clauses, relational clauses). Classifying compounds, Lieber (2009 p.43) shows that there may be different ways of classifying compounds in English and in other languages. As he shows it, the head of the compound is an indispensable element that can help explain various types of compounds. Katamba and Stonham (2006 p.317) highlight what Lieber (2009 p.43) puts by stating that normally compounds are classified using two criteria. That is, to classify compounds, the presence or the absence of the head must be considered. Besides, if the compound has a head, the word-class of the head must be taken into account. The position of the head can also be considered to classify compounds.

In his classification of compounds, Lieber (2009 p.46) explains that compounds can also be divided into *root compounds* (also known as *primary compounds)* and *synthetic compounds* (also referred to as *deverbal compound*). *Synthetic compounds* are composed of two lexemes, where the head lexeme is derived from a verb, and the non-head is interpreted as an argument of that verb. That is, the first element is represented as

the object of the verb contained within the second component of the compound (McCarthy, 2002 p.63). Although Lieber (2009) refers to such compounds as deverbal compounds, Katamba and Stonham (2006) and McCarthy (2002) call them *verbal compound*. *Root compounds*, by contrast, are made up of two lexemes, which may be nouns, adjectives, or verbs, but the second lexeme is typically not derived from a verb.

Another way of classifying compounds is by considering the semantic and grammatical relationships holding between the elements that make them up. Accordingly, three types of compounds can be distinguished: (1) attributive compounds, (2) coordinative compounds and subordinative compounds.

In *attributive compounds* the non-head acts as a modifier of the head. This first element might express just about any relationship with the head. Regarding *coordinative compounds*, their first element does not modify the second; instead, the two have equal weight. In English, compounds of this sort can designate something which shares the denotations of both base elements equally, or is a mixture of the two base elements. By contrast, in *subordinative compounds*, one element is interpreted as the argument of the other, usually as its object. Typically this happens when one element of the compound either is a verb or is derived from a verb (Lieber, 2009 p.48). It should be pointed out that attributive, coordinative, and subordinative compounds can be further divided into *endocentric* or *exocentric compounds*. As its name suggests it, in *endocentric compound,* the referent is always the same as the referent of its head. By contrast, in *exocentric compounds***,** the referent of the compound as a whole is not the referent of the head.

As can be realized, all the above classifications fail to classify compounds with respect to the representation of meaning, as it is the case with the clause. All these classifications do not classify compounds with reference to the process encoded in the compound. They also fail to show that a given experience can be encoded by means of compounds. That is why this article comes up with another classification of compounds based on the experiential function of language.

3. Method

This study is a documentary research. To collect data, the book entitled '*Telecoms. De la Transmission à l'Architecture des Réseaux*' was read with a view to collect compound words used by computer scientists in the interconnection of computers in order to form a computer network. The choice of this book was motivated by the fact that it contains many technical compounds related to computer networking. Besides, as this book is written in French, it seemed a precious guide to find technical compound words related to computer networking, and which are really English. Data were also collected from the following books on computer networking which were read thoroughly in order to collect technical terms on computer networking, namely: (1) *Computer Networks* by Aderounmu (2008), (2) *Computer Networking. A Top-Down Approach* by Kurose and Ross (2013), (3) *Computer Networking: Principles, Protocols and Practice* by Bonaventure (2011), (4) *An Introduction to Computer Networking* by Dordal (2021), (5) *Data Communication and Computer Network* by Tutorials Point (2014), (6) *Fundamentals of Computer Networking and Internetworking* by Comer (2014), and (7) *Basic Computer Networking* by Robertazzi (2011). The choice of all the above was motivated by the fact that they deal only with computer networking. Besides, all of them contain nearly the same technical specific terms of computer networking used in the well known computer network architectures such as OSI (Open System Interconnection), DSA (Distributed System Architecture), SNA (System Network Architecture) and TCP/IP (Transmission Control Protocol/Internet Protocol). These data do not form a homogenous group. That is why they were stratified on the basis of their underlying structures.

As a recall, *transitivity* is defined as a tool that enables to conceptualize and describe the experience, whether of the actions and events, people and things of the external world, or of the internal world of the thoughts, feelings and perceptions. Consisting of different elements, this grammatical system is the resource for construing the experience of the world around us and inside us. First, it has a set of process types by which the world of experience is construed. Second, it includes the type of the participants (participation) involved in the process. Third, it may involve the circumstances attendant on the process (time, space, cause, manner, etc.). Finally, it is made of the attributes ascribed to the participants.

Accordingly, to analyze collected data, this study will resort to transitivity analysis. This choice is justified by the fact that it is mainly concerned with the experiential function, and *transitivity* is part of the ideational

function of language. It carries out this ideational function through different processes. Six processes are outlined in *Systemic Functional Grammar*. However, this study will look only at the main processes, viz, material processes, mental processes and relational processes as the other processes do not apply to the data collected for this research. To this end, the compounds will be reconstructed with reference to their underlying structure with the purpose to identify the process that has been at work in order to construct the meaning. This will help to point out compounds expressing material processes, mental processes and relational processes.

For the material processes, the analysis will attempt to find out if the structure is made of the Actor+Process, of the Process+Actor, or of the Actor+Process+Goal. Then an explanation will be given about the absence of such or such an element which could be included in the process. As to the relational processes, the analysis will examine the structure of sub-processes and see whether it is made of all elements or not. That is, the analysis will examine (1) the intensive attributive relational processes, (2) possessive processes, (3) intensive identifying processes (4) circumstantial attributive relational processes, and (5) circumstantial identifying processes.

4. Analysis of Data and Results

Compounds were analyzed and classified with reference to the process they contain. This helped to sort out compounds containing material processes and relational processes. However, the study reveals the absence of compounds containing mental processes. Accordingly, compounds were classified as material compounds (henceforth MACO), relational compounds (from now on RECO) and mental compounds (hitherto MECO), depending on the process that they contain. Some compounds, notably, headless compounds, were not classified since their underlying structures did not reveal whether it is the one of material process or of mental process. Table 4.1 provides the statistics of the compounds identified in the corpus.

Table 4.1: Functional Repartition of Compounds

TYPES	**MACO**	**RECO**	**MECO**	**UNCLASSIFIED**	**TOTAL**
OCCURENCE	105	56	0	5	166
PERCENTAGE	63,3	33,7	0	3	100

Table 4.1 reports that *mental compounds* are not used to construe the realities of the computer networking jargon since 0% percent of occurrence of these processes springs out from Table 4.1. This may be due to the fact computer scientists are not concerned with construing their inner experience in the field of computer networking. By contrast, this table reveals that *material* and *relational compounds* are used to construe the experience of the computer networking jargon. As the statistics in Table 4.1 show, *material compounds* are dominant in the construction of the experience of the computer networking jargon since the percentage of their occurrence is 63, 3%. They are followed by *relational compounds* which have collected 33, 7%. It seemed difficult to classify some compounds, for instance headless compound. Table 4.1 reports 7, 3% of unclassified compounds whose underlying structures do not reveal whether they were material process or not.

4.4.1 Material Compounds

Material compounds refer here to those compounds whose underlying structures express material process, that is, they construe doings and happenings in the field of computer networking. The analysis will try to see whether the underlying structure of the compound is made of all the participants or not, and account for the absence or the presence of such or such an element. After having scrutinized *material compounds* identified in the corpus, it was found that there are *material compounds* which imply *Actor+Process*, *Process+Goal* and Actor+*Process+Goal*. Table 4.2 provides the statistics of the occurrence of the subtypes of *material compounds* found in the corpus.

Table 4.2: Subtypes of Material Compounds founds in the Corpus

TYPES	**APRO**	**PROGO**	**APROGO**	**TOTAL**
OCCURENCE	2	25	73	100
PERCENTAGE	2	25	73	100

From Table 4.2, it can be noticed that *material compounds* involving *Actor*, *Process* and *Goal* dominate the corpus since the percentage of their occurrence reported in the Table is 73. Regarding the processes involving the *Process* and the *Goal*, Table 4.2 reveals that 25% of these compounds are found in the corpus. Another inference that can be made from the above table is that very few cases of *material compounds* involving *actor* and *process* are identified in the corpus since their percentage of occurrence is 2%.

4.1.1. Material Compounds Involving Process+Goal

These are compounds whose underlying structures are made only of the process and the goal. In such compounds the *Actor* is not explicitly present, but implied. The following example drawn from the corpus is just an illustration:

(1) Transmission Control

As can be noticed, the example in (1) is comparable to the phrase $Controls_{Process}$ $Transmission_{Goal}$. From the underlying structure of the compound noun in (1), it can be realized that the Actor of the process *controls* is missing. The absence of the actor in this process can be due to the fact that the meaning is centered on the action of *controlling* and to *what is controlled* rather than on the actor performing the action of controlling. However, the implied agent appears in the definition of the compound noun in (1) that can be paraphrased as: *The layer that controls the transmission*. The word *Layer* does not appear in the compound noun in (1), but it is implied because the stress is not put on the *layer* that performs the action.

4.1.2. Material Compounds Involving Actor+Process+Goal

The corpus is also characterized by material compounds containing the Actor, the Process and the Goal. These are compounds whose underlying structures are the ones of material processes; they contain all the participant of material processes, namely, the Actor, the Process and the Goal. The example in (2) illustrates such compounds identified in the corpus.

(2) Transmission Control Protocol

A closer look at the compound noun in (2) can reveal that it has an underlying phrase structure of material processes. It can be compared to the phrase $Protocol_{Actor}$ $Controls_{Process}$ $Transmission_{Theme}$. From this underlying structure, it can be seen that the role of participants in the process is realized by the Actor *Protocol* and by the Goal *Transmission*, and the process is realized by the verb *Controls.* Briefly put, the stress is put on the *Protocol* perhaps to show that it is the *Protocol* that performs the transmission on the net, not any other thing. This kind of precision may have been given in order to give the precise meaning of the protocol and to avoid confusion with other devices or protocols that may also perform the action of controlling.

4.1.3. Material Compounds Involving Actor+Process

The scrutinization of the compound nouns found in the corpus helped to identify material compound involving only the *Actor* and the *Process*. That is, the underlying phrase structure of the compound does not contain the *Goal* of the process. The example in (3) is an illustration of material compounds involving *Actor+Process,* and identified in the corpus.

(3) Synchronization Bit.

From the compound noun in (3), it can be observed that its underlying structure can be paraphrased as: Bit_{Actor} $synchronizes_{\text{Process}}$. The process in (3) is realized by the action-verb *synchronize*. However, it is incomplete since it lacks another participant: *the argument object*. The absence of the *Goal* in this example

may be due to the fact that the computer scientists who formed this compound noun put the stress on the action of *synchronization* and on the thing that performs this action of *synchronization* rather than on what is being synchronized.

4.2. Relational Compounds

By *relational compounds* is meant here those compounds in which a given relationship can be established between the constituents of the compounds as it will be brought out in the following lines. Accordingly, the analysis will turn around intensive attributive compounds (henceforth INACO), intensive identifying compounds (from now on INTICO), possessive compounds (hitherto POCO), circumstantial attributive compounds (henceforth CIRCACO) and circumstantial identifying compounds (from now on CIRCICO), depending on the relationship that can be established between the constituents of the compounds. Table 4.3 presents the statistics of the relational compounds found in the corpus:

Table 4.3: Relational Compounds Identified in the Corpus

TYPES	**INACO**	**POCO**	**CIRCACO**	**CIRCICO**	**INTICO**	**TOTAL**
OCCURENCE	20	19	5	7	5	56
PERCENTAGE	35,8	33,9	8,9	12,5	8,9	100

The statistics presented in Table 4.3 reveal that *INACO* are more used than other relational compounds since it shows that their percentage of occurrence is 35, 8%. However, they are counterbalanced by *POCO* that have collected 33,9%. Besides, Table 4.3 indicates that CIRCICO have 12,5% of occurrence in the corpus. Furthermore, it can be concluded from Table 4.3 that INTICO and CIRCACO have the same percentage of occurrence in the corpus since they both have 8,9%.

4.2.1. Intensive Attributive Compounds

INACO refer to compounds in which an intensive attributive relation can be established between the components making up the compound. A close examination of the phrase structure of the compound nouns comprised in the corpus helped to realize that INACO were used in the construction of meaning conveyed by the compound as can be seen in the example (4) taken from the corpus as an illustration

(4) Shielded Twisted Pairs

The phrase structure underlying the example in (4) is *Pairs are twisted and shielded.* The process in this structure is realized by the verb *are.* In addition, it appears from this phrase that the attribute *Twisted and shielded* is ascribed to *Pairs*, which plays the role of *carrier* in the process. Differently put, the compound in (4) is an INACO since an intensive attributive relation can be established between *Pairs* and *Twisted and shielded* .This means *Twisted and Shielded* qualify the *Pairs.*

4.2.2. Possessive Compounds

The analysis of the corpus reveals that a possessive relationship can be established between the constituents of some compounds found in the corpus. Such compounds are referred to here as POCO, as illustrated in the example (5) below.

(5) Network User Address

As can be observed, the underlying structure of the compound in (5) can be reconstructed as *the address of the user of network* or *the user of the network has an address.* When this structure is scrutinized, it can reveal that the relationship of possession can be established between *network user* and *Address* which are the constituents of the compound in (5), which means that the entity *network user* possesses the entity *protocol.* In this way, the relationship of possession is construed as the process by the verb *has* which lies in the underlying structure of the compound in (5). That is, *network user* is the Carrier and *address* is the Attribute. The relation of possession in (5) can also be reconstructed as *The address is Network User's.* When this strucure is expressed in this way, *the address* is the carrier and *Network User's* is the Attribute.

4.2.3. Circumstantial Identiying Compounds

This point starts by showing that CIRCICO are compounds in which a circumstantial identifying relation can be established between the constituents of the compounds as can be seen in the analysis of the compound in (6) taken from the corpus.

(6) Local Area Network.

It can be observed from the compound in (6) that a circumstantial relationship of place can be established between *Local Area* and *Network.* This compound can be reconstructed as follows: *network covers local area or network spans local area.* The structure of this compound shows that the entity *Network* is being related to *Local Area* by a feature of place. Here, both *Network* and *Local Area* are not circumstantial elements of place. That is, they are not construed as circumstance. By contrast, the circumstance is construed as process by means of *covers/spans,* which means that the circumstance of place is encoded in the circumstantial verb *covers/spans.* Another possibility would be to reconstruct the compound in (6) as: *Network is in local area.* Reconstructed in this way, the circumstantial relationship of place is expressed by the prepositional phrase *in local area.*

4.2.4. Circumstantial Attributive Compounds

CIRCACO refers here to compounds in which a circumstantial attributive relation can be established between the constituents of the compound. The example in (7) is just an illustration of such compounds emerging from the corpus.

(7) Bull Cabling system

A closer investigation into the compound in (7) can help to establish a circumstantial relationship between *Bull* and *Cabling System.* This can be done by reconstructing the underlying structure of this compound. That is, the compound in (7) can be reconstructed as : *Cabling system by Bull or Cabling sysem is from Bull.* To put it in other terms, the circumstantial element *from Bull* is an Attribute that is being ascribed to the entity *Cabling System.* The implication is that *from Bull* is construed in the form of the Attribute, which is realized by the prepositional phrase (*from Bull).*

4.2.5. Intesive Identifying Compounds

INTICO refers to compounds in which an intesive identifying relation can be established between the constituents of the compounds, as can be seen through the compound in (8) taken as an illustration from the corpus.

(8) Star topology

An intensive relationship of identification can be established beween *topology* and *star*, which are the constituents of the compound in (8). This relation can be established by reconstructing the underlying structure of this compound. That is, the compound can be reconstructed as : *The topology is star.* A close look at this structure can make realize that the form of the topology is compared to the form of the star. Stated in other words, the form of the topology is identified as the one of star. This implies that *star* serves to identify this type of topology of a network, which means that *star* is the identifier whereas *topology* is the identified. As an intensive identifying relation can be established between the constituents of the compound in (8), the compound is then called INTICO.

4.3. Mental Compounds

As Table 4.1 reveals, there is no case of mental compounds pointed out from the corpus. This table reports 0% of mental processes identified in the corpus. This result can be attributed to the fact that computer scientists are not concerned with construing the experience of their inner world. They are not concerned with expressing their feelings, attitude and emotions regarding what they experience in the field of computer science. By contrast, they are concerned with describing objectively the realities of the field they are involved in. That is why mental compounds are not at work in the construction of meaning in the computer networking jargon.

5. Discussion of the Findings

On the question of how the ideational function of language (experiential function) is expressed to construe the experience of computer networking, the current study reveals that it is realized through material and relational processes, with material processes dominating relational ones. It is interesting to note that compounds are the linguistic units used to realize these processes, although most of the literature on transitivity concentrate only on clauses. On the contrary, this study has shown that transitivity can also be expressed by means of compounds since they have underlying phrase structures that can be reconstructed in order to discover the process that has been at work in order to form them. In other words, by reconstructing the underlying phrase structures of compounds found in the corpus, it became possible to discover how the computer networking persons use the English language in order to represent their experience in computer networking, which is a subfield of computer science.

The analysis of data indicates that mental compounds are not used to construe the experience of computer networking. This may be due to the fact that computer scientists are not concerned with construing the experience of their inner world. That is, they are not concerned with the representation of their feelings, attitudes and emotions regarding what they experience in the field of computer networking. On the contrary, they are concerned with representing the doings and happenings in the computer networking field.

As already pointed out in the point related to the analysis of data, material compounds are more used than relational ones in order to construe the experience of computer networking. This may be due to the fact that most of the time the experience in computer networking is construed in happening/doing mode than in relational mode. As regards material compounds, the study shows that they are realized in three configurations depending on what must be construed: (1) actor+process, (2) process+goal, and (3) actor+process+goal. A closer look at these different material compounds configurations can give a clear idea about how language is used by computer networking persons in order to construe the field of computer networking.

The configuration *actor+process+goal* dominates the other configurations mentioned in the above paragraph. The presence of all these semantic roles in this configuration can be justified by the fact that, as these processes construe the happenings and the doings; computer networking persons would like to put a stress on the action being done, on the doer of the action and on what the action is extended to. By doing this, the confusion that might rise from the absence of a given semantic role can be avoided since its absence can refer to another experience than to the experience that must be really construed.

Regarding the configuration *Process+Goal*, its use can be justified by the fact that it is only the action and the goal which play an important role in the construal of the experience. That is, the actor is not essential to the process, because what matters here is the action performed and the goal to which it is extended. It is noteworthy here that the actor is implied below, but above the actor is present. With regard to the configuration *Actor+Process*, it is worth pointing out that when the goal is not necessary in the semantic configuration of a fragment of experience, there is no need construing it because the process refers only to one object in the field of computer networking. Although only the actor and the process are construed in this configuration, the goal is implied. To put it in other terms, the action and the doer of the action are sufficient to construe the experience.

All the configurations of material compounds identified in the corpus prove the fact that, in some cases, a participant may not be explicitly mentioned in the configuration of the process. This is in according with the assertion put forward by Thompson (2014 p.93) who shows that the participant which is not explicitly mentioned is understood as part of the experiential meaning. What Thompson (2014 p.93) shows implies that for one to interpret the material process construed by the compound, she/he must use his/her knowledge of the computer networking, not only his linguistic knowledge.

Concerning relational compounds, the study reveals that they are realized in five configurations, notably, (1) intensive attributive compounds, (2) possessive compounds, (3) circumstantial attributive compounds, (4) circumstantial identifying compounds, and (5) intensive identifying compounds. The configuration intensive attributive compounds is more used than the other types relational compounds listed above since its percentage of occurrence is greater than the ones of other configurations.

The underlying structure of compounds in which an intensive attributive relation can be established between the components of the compounds indicates that intensive attributive processes underlying the

compounds are realized by means of the static verb *be*. That is, the attributes ascribed to the carriers are current attributives. The configuration of possessive processes can be expressed either in attributive mode or in identifying mode depending on how the possessive relation that can be established between the constituents of the compounds. The results also show that a circumstantial identifying relation, a circumstantial attributive relation, and an intensive identifying relation can be established between the constituents of some compounds of the networking jargon.

Hence, the use, in this article, of the terms such as intensive attributive compounds, intensive identifying compounds, possessive compounds, circumstantial attributive compounds, and circumstantial identifying compounds to refer respectively to compounds in which an intensive attributive relation, an intensive identifying relation, a possessive relation, a circumstantial attributive relation, and a circumstantial relation can be established between the constituents of the compounds. . All these subtypes of compounds fall under the type of *relational compounds*. That is, compounds in which a given relation can be established between the constituents of the compounds. For compounds with the underlying structures of material processes, the term *material compound* is used in this paper to refer to them.

5.1. Conclusion

This analysis has shown that compounding is a word formation mechanism whereby information can be compressed without losing its content. In other words, compounds can embody different processes which can help see how the representational function of language is realized. To disclose these processes, one should resort to the reconstruction of the underlying structure of the compound as it has just been done in the above analysis. This implies that, by looking at compounds in a functional way, it is possible to discover how the experience of given field is represented.

The study showed that transitivity is used to construe the computer networking realities at experiential level. This experiential function of language is expressed by means of compounds since most of the words formed to express the experience of computer networking are compound nouns. Clearly, material compounds are more used than relational compounds in order to construe the experience of the computer networking. The analysis also showed that mental processes are not used to construe the experience of computer networking. Hopefully, this study can help EFL learners/teachers involved in Computer networking enhance their learning/teaching of English related to this subfield of computer science.

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Appendix

1. Material Compounds

The following subcorpus includes some material compounds found in the computer networking jargon. By *material compound* is meant here the type of compounds whose underlying structure is the one of material processes.

1.1. Material Compounds Involving Process and Goal

The following subcorpus contains material compounds made only of Process+Goal (The Actor does not apprear in the underlying structure, but it is implied.

N°	COMPOUNDS	UNDERLYING STRUCTURES
1	Amplitude Modulation	Modulates amplitude
2	Cell Relay	Relays cells
3	Command Reject	Rejects a command
4	Computer Networking	Networks computers
5	Data Compression	Compresses data
6	Device Control	Controls device
7	File Separator	Separates files
8	Frame Reject	Rejects frames
9	Frame relay	Relays frames
10	Frequency Multiplexing	Multiplexes frequencies
11	Group Separator	Separates group
12	Line Coding	Codes line
13	Link Control	Controls link
14	Neighbors Discovery	Discovers neighbor
15	Path Control	Controls path
16	Terminal Management	Manages terminal
17	Transmission Control	Controls transmission

1.2. Material Compounds Involving Actor and Process

The subcorpus below comprises material compounds whose underlying structure is made of Actor+Process (Here the goal is missing, but it is implied).

N°	COMPOUNDS	UNDERLYING STRUCTURES
1	Synchronization Bit	Bit synchronizes
2	Transmission Medium	Medium transmits

1.3. Material Compounds Involving Actor, Process and Goal

This subcorpus presents some material compounds whose underlying structure is made of actor+process+goal.

N°	COMPOUNDS	UNDERLYING STRUCTURES
1	Address Resolution Protocol	Protocol resolves address
2	Advanced Data Communication Control Protocol	Protocol controls advanced data communication
3	Application Programming Interface	Interface programmes application
4	Cluster Control Node	Node controls cluster
5	Communication Unit Control Node	Node controls communication unit
6	Convergence Sublayer Information	Sublayer informs convergence
7	Data Encryption Standard	Standard encrypts data
8	Data Network Identification code	Code identifies Data network
9	Datagram Congestion Control Protocol	Protocol controls datagram congestion
10	Digital Data Communication Protocol	Protocol communicates digital data
11	Dynamic Host Configuration Protocol	Protocol configurates dynamic host
12	Explicit Forward Congestion Identification Protocol	Protocol identifies explicit forward congestion
13	File Transfer Protocol	Protocol transfers file
14	Frame Check Sequence	Sequence checks frame
15	Interior Gateway Routing Protocol	Protocol routes interior gateway
16	International Data Encryption Standard	Standard encrypts international data
17	Internet Message Access Protocol	Protocol accesses internet message
18	Layer Mangement Interface	Interface manages layer
19	Light Emitting Diode	Diode emits light
20	Lightweight Directory Access Protocol	Protocol accesses lightweight directory
21	Link Access Protocol	Protocol accesses link
22	Link Control Mode	Mode controls link
23	Mail Delivery Agent	Agent delivers mail
24	Mail Submitter Agent	Agent submits mail
25	Mail User Agent	Agent uses mail
26	Message handling system	System handles message
27	Network Control Program	Program controls network
28	Network Control Protocol	Protocol controls network
29	Network Intrusion Detection System	System detects network intrusion
30	Network Management System	System manages network
31	Network Service Access Point	Point accesses network service
32	Resource Management Cells	Cells manage resource
33	Service Access Point	Point accesses services
34	Simple Mail Transfer Protocol	Protocol transfers simple mail
35	Simple Network Management Protocol	Protocol manages simple network
36	System Service Control Protocol	Protocol controls system service
37	Transmission Control Protocol	Protocol controls transmission
38	Transport Service Access Point	Point accesses transport service

39	Trivial File Transfer Protocol	Portocol transfers trivial file

2. Relational Compounds

The term *relation compounds* is used here to refer to compounds in which a given relation can be established between the constituents of the compound.

2.1. Intensive Attributive Compounds

The subcorpus below comprises some intensive attributive compounds found in the computer networking jargon. Intensive attributive compounds are compounds in which an intensive attributive relation can be established between the constituents of the compound.

N°	COMPOUNDS	UNDERLYING STRUCTURES
1	Asynchronous Balanced Mode	Mode is balanced and asynchronous
2	Basic Activity Subset	Subset activity is basic
3	Basic Combined Subset	Subset is combined and basic
4	Basic Synchronized Subset	Subset is synchronized and basic
5	Binary Synchronous Bit	Bit is binary and synchrounous
6	Binary Synchronous Communication	Communication is binary and synchronous
7	Coaxial Cable	Cable is coaxial
8	Connetionless oriented Network Service	Network service is connectionless-oriented
9	Logical Unit	Unit is logical
10	Normal Response Mode	Response mode is normal
11	Shielded Twisted Pairs	Pairs are twisted and shielded
12	Unshielded Twisted pairs	Pairs are twisted and unshielded
13	Variable Bit Rate	Bit Rate is variable
14	Virtual Computing Network	Network computing is virtual
15	Visual Interface Protocol	Interface protocol is visual

2.2. Possessive Compounds

The subcorpus below contains some possessive compounds found in the computer networking jargon. The term *possessive compound* is used here to refer to those compounds in which a relation of possession can be established between the constituents of the compound.

N°	COMPOUNDS	UNDERLYING STRUCTURES
1	Communication Architecture	Communication has an architecture (the architecture of a communication)
2	Data Link Layer	Data Link has a layer (The layer of Data Link)
3	Internet Protocol	Internet has a protocol (The protocol of internet
4	Network Architecture	Network has an architecture (The architecture of network)
5	Network Interface Card	Network has an interface card (the interface card of network)
6	Network Layer	Network has a layer (the layer of network)
7	Network Topology	Network has a topology (the topology of network)
8	Network User Address	Network User has an address (the address of the network User
9	Office Document Architecture	The Office document has an architecture (the architecture of the office document)
10	Post Office Protocol	The post office has a protocol (the protocol of the post office)

11	Session Layer	The session has a layer (the layer of session)
12	System Network Architecture	The system network has an architecure (the architecure of the system network)
13	User Application Process	The user has application process (The application of the user
14	User Data Protocol	The user has Data Protocol (The data protocol of the User)

2.3. Circumstantial Attributive Compounds

The subcorpus below comprises some circumstantial attributive compounds found in the computer networking jargon, which are compounds in which a circumstantial attributive relation can be established between the constituents of the compound.

N°	COMPOUNDS	UNDERLYING STRUCTURES
1	Bull Cabling System	Cabling system is from Bull
2	Joint Picture Expert Group	Joint Picture is from Expert Group
3	Microcom Networking Protocol	Networking Protocol is from Microcom
4	Moving Picture Expert Group	Moving Picture is from Expert Group

2.4. Circumstantial Identifying Compounds

The following subcorpus comprises some circumstantial identifying compounds found in the computer networking jargon. The term circumstantial attributive compound is used here to refer to compounds in which a circumstantial identifying relation can be established between the constituents of the compounds.

N°	COMPOUNDS	UNDERLYING STRUCTURES
1	Local Area Network	Network spans local area (a network which covers a local area
2	Metropolitan Area Network	Network spans metropolitan area (a network which covers a metropolitan area
3	Personal Area Network	Network spans personal area (a network which covers a personal area)
4	Wide Area Network	Network spans wide area (a network which covers a wide area

2.5. Intensive Identifying Compounds

The subcorpus below comprise some intensive identifying compounds found in the computer networking jargon, which are compounds in which an intensive identifying relation can be established between the constituents of the compounds.

N°	COMPOUNDS	UNDERLYING STRUCTURES
1	Bus topology	Topology is bus
2	Mesh topology	Topology is mesh
3	Ring topology	Topology is ring
4	star topology	Topology is star

3. Unsclassified Compounds

This subcorpus comprises some headless compounds found in the computer networking jargon, and whose underlying structures do not show whether it is the one of material processes or relational processes

N°	COMPOUNDS
1	Firewall

2	Gateway
3	Mailbox
4	Network