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The Grammar of Relational Processes in English and Spanish: Implications for Machine-Aided Translation and Multilingual Generation

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ABSTRACT

The current paper concentrates on the grammar of relational processes in English and Spanish, both from a theoretical and an applied perspective. From the theoretical perspective, the study provides a contrastive account of relational processes within the systemic-functional framework provided by the extensive cartographic reference grammar of the English language developed by C. Matthiessen (1995). From the applied perspective, the paper takes as a point of departure the specifications contained in the English computational grammar Nigel, a component of the KPML multilingual generation environment (Bateman 1995, 1997), extending and modifying them to include the notion of ergativity, as a separate and necessary system within the paradigmatic potential of both English and Spanish. The contrastive account is shown to be of use in application contexts such as machine-aided translation and multilingual generation, where the grammatical specifications proposed are necessary for achieving accurate translations and the correct generation of lexical processes.

1. INTRODUCTION

This paper provides a contrastive account of the grammar of relational processes in English and Spanish in application contexts such as machine-aided translation (MAT) and multilingual generation (MLG) [1]. The theoretical framework from which we depart is the systemic-functional model, more specifically, the specifications contained in the computational grammar Nigel, a component of the KPML multilingual generation environment (Bateman 1995, 1997), and on the extensive cartographic reference grammar of the English language developed by C. Matthiessen (1995).

The design of nuclear transitivity in these grammars is based on the interaction of two simultaneous systems: a system of PROCESS TYPE, and a system of AGENCY. The former accounts for the semantics of the Process of the clause, while the latter has been traditionally considered to be concerned with the variable of "causation", i.e. with whether the process is caused by an external agent or not, thus cutting across all process types. This design, though used in MLG, blurs a fundamental distinction between the transitive and the ergative systems, which, as pointed out and demonstrated by different scholars (Davidse 1992, Lavid and Arús 1998), have different grammatical centers and different 'directionalities', and are realized by different lexical processes both in English and in Spanish. The relationship between the Process, realized by the verb, and the Medium, the most nuclear participant, is different in transitive and in ergative processes.

For those unfamiliar with systemic-functional grammar (henceforward SFG), it should be pointed out that the use of "transitive" and "ergative" does not exactly correspond to the traditional one. "Transitive" does not contrast with "intransitive", and "ergative" does not contrast with "accusative". The notion of ergativity, as used in SFG, has very little to do with the way it is used elsewhere. Dixon (1994) criticizes the use of this term for a phenomenon that has to do with "causation". Though we agree that the latter may be a more felicitous term, this paper will stick to that of "ergativity" to abide by the convention in SFG.

In the systemic-functional tradition, stemming from Halliday (1967, 1970, 1985, 1994), processes are middle or effective. If middle, they have only one nuclear participant. If we apply the above referred split transitivity/ergativity to material processes, which are the ones typically used to illustrate general explanations, that central participant is the Actor in transitive processes and the Affected in ergative ones, as shown in (1a, b) and (2a, b), respectively. If the process is effective, it extends to the right, in the case of a transitive process, including a Goal, as in (1c, d), or it opens to the left, to incorporate an Instigator, if the process is ergative, as in (2c, d). The most salient differences between transitive and ergative processes is that, among the former, verbal realizations can only perform either middle or effective processes. See, for instance, middle (1a, b), which has no effective pair (3a, b). Conversely, ergative verbs may take part in both middle and effective constructions, as shown in English (2a) and Spanish (2b), which have effective counterparts (2c) and (2d), respectively.

In a transitive construction like (1c) the relationship between the Process *threw* and the Goal/Medium[2] *the ball* is one where *the ball* is simply affected by the process, but does not actively participate in it. In an ergative construction like (2c) the relationship between *bounced* and the Affected/ Medium *the ball* is one where *the ball* is both the affected and the active participant in

the process, thus allowing the construction of the pair (2a, c), which is not possible with a transitive process like *run* or *throw*, as we see in (3) and (4), respectively. Notice that a realization like (4) implies a Goal, therefore being effective. The process would be incomplete if no Goal was implied.

(1) TRANSITIVE SYSTEM (PROCESS AND EXTENSION MODEL)

	Actor	+	Process	+	(Goal)	
(a)	John		is running			(transitive: middle)
(b)	Juan		está corriendo			
(c)	Peter		threw		the ball	(transitive: effective)
(d)	Pedro		lanzó		la bola	

(2) ERGATIVE SYSTEM (INSTIGATION OF A PROCESS MODEL)

	(Instigator)	+	Medium	+	Process	
(a)			The ball		bounced	(ergative: middle)
(b)			La pelota		botó	
(c)	Mary		bounced		the ball	(ergative: effective)
(d)	María		botó		la pelota	

(3) (a) *John is running the boy[3]
(b) *Juan está corriendo al niño

(4) (a) *Peter threw
(b) *Pedro lanzó

The transitive/ergative distinction is also important in considering how semantically related processes behave differently in English and in Spanish. Whereas examples like (1) and (2) above show a parallelism in both languages, there are cases in which the same process is expressed transitively in one language and ergatively in the other. Thus, in (5) and (6), the material process of motion lexified in English as *march*, and in Spanish as *marchar,* is ergative in the former and transitive in the latter, since both (5a) and (5b) are possible in English, but only (6a) exists in Spanish.

(5) (a) The soldiers marched for two hours
(b) The sergeant marched the soldiers for two hours

(6) (a) Los soldados marcharon durante dos horas
(b) *El sargento marchó a los soldados durante dos horas

As will be shown in the rest of this paper, the transitive/ergative distinction is also fundamental for the contrastive analysis of relational processes in both languages, and has important implications both for human and machine-aided translation and multilingual generation: failing to account for such distinction in the system networks representing the grammatical organization of each language would result in a higher probability of inaccurate translations and in the generation of incorrect language pairs.

The paper is structured as follows: section 2 presents an overview of nuclear transitivity in the computational grammar Nigel, providing a revision of the original network to include the system of ERGATIVITY, concerned with the notion of "causation", while keeping the system of AGENCY to deal with the presence or absence of an Agent. Section 3 provides an introduction to the grammar of relational processes within the framework of Systemic-Functional Grammar. Section 4 presents a contrastive account of this type of processes in English and Spanish applying the transitive/ergative distinction which has been found to be relevant for other process types. Section 5 shows how lexically delicate systems can also account for relevant differences between both languages which must be taken into account when applied to MAT and MLG. Finally, section 6 winds up and offers some concluding remarks.

2. NUCLEAR TRANSITIVITY IN THE COMPUTATIONAL GRAMMAR "NIGEL"

The large computational grammar Nigel (Matthiessen 1988a, 1988b, 1988c; 1990, 1995) of the KPML multilingual generation environment (Bateman 1995, 1997) contains the lexicogrammatical systems which capture the interrelated options available in the grammar of English from the point of view of the three systemic metafunctions –ideational, interpersonal and textual– and at the hierarchical level of the clause and the group. The ideational metafunction, which is divided into experiential and logical, is the resource for construing our experience of the world, by means of configurations of processes, participants, circumstances, etc. The interpersonal metafunction is the resource for enacting roles and relations in dialogic

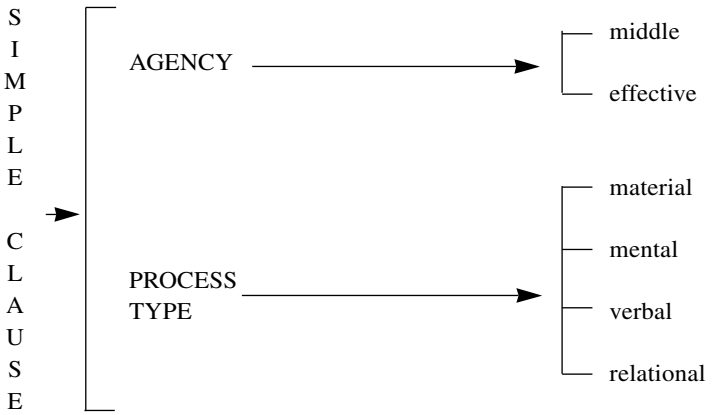


Figure 1. Two simultaneous Systems in Nuclear Transitivity, adapted from Nigel (Matthiessen 1988a, b, c, 90, 95)

interaction. The textual metafunction enables the speaker to present ideational and interpersonal meanings as information organized into text that unfolds in discourse (*Cf.* Matthiessen 1995:85). The ideational metafunction at clause level is mainly represented in this grammar by the system of TRANSITIVITY, which consists of two large sub-systems: NUCLEAR TRANSITIVITY and CIRCUMSTANTIAL TRANSITIVITY. Nuclear Transitivity deals basically with Process and Participants.

The system network does not generate grammatical structures; it represents a purely paradigmatic grammar and it needs a realization component to produce grammatical structures. The grammatical potential is stated in terms of the system network. Realization statements for building structure are associated with systemic features in this system network; they specify the grammatical structure of a unit step by step. The potential is actualized by means of the grammatical generation algorithm. The generation algorithm traverses the system network of the unit of a particular unit of rank *n*, say clause rank, by selecting features in systems. At the same time any realization statements associated with the features selected are executed, leading to a specification of a fragment of structure. The result of the traversal is a record of the features selected, the *selection expression*, and a grammatical structure for the unit being generated –a particular actualization of the potential–. The grammar is entered first at the highest ranks of the rank scale. After the traversal has been completed, the grammar is re-entered to develop each of the constituents of the structure generated (unless they are specified lexically). Unless there is rankshift, these constituents will all be units of the

rank next below rank *n (n + 1)*, i. e. group/phrase rank if the previous rank was clause rank.

The most general system of NUCLEAR TRANSITIVITY in the Nigel grammar presents two interrelated systems, as illustrated in Figure 1: a system of PROCESS TYPE and a system of AGENCY. The former deals with the semantic type of process involved, and the latter distinguishes between processes caused by an external agent (i.e. effective) and those which are not (i.e. middle).

While we agree that the system of AGENCY refers to whether there is an agent or not, it does not necessarily imply "causation", as has been traditionally understood. The transitive effective process in (1c, d) incorporates an Agent, *Peter/Pedro*, but this Agent is not the "causer" of the process of "throwing". By contrast, *Mary/María* causes the bouncing of the ball in (2c, d). Therefore, we believe that the notions of "causation" and "agency" should be kept separate and captured by two different systems: the system of ERGATIVITY, capturing the notion of "causation" or "instigation" of the process, and the system of AGENCY, dealing with the presence or absence of an Agent. These two systems, together with the one of PROCESS TYPE, are illustrated in Figure 2 below[4].

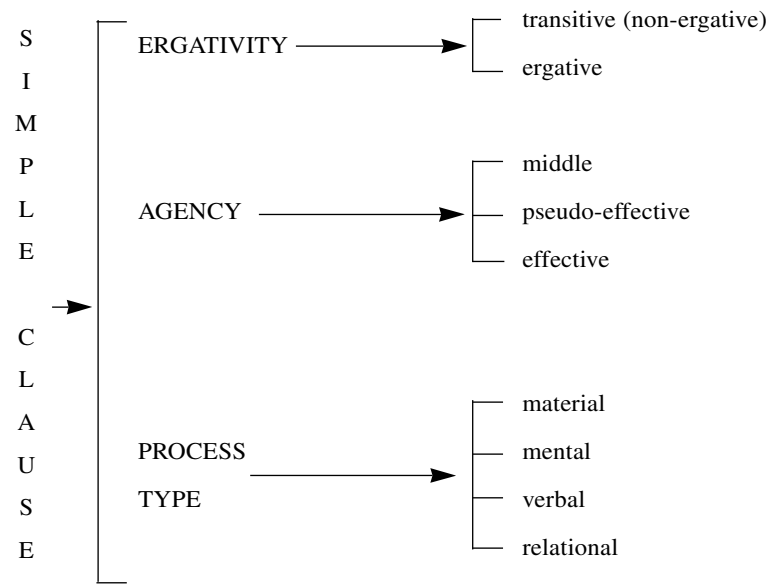


Figure 2. Three simultaneous systems in Nuclear Transitivity

The distinction between transitive and ergative processes has been mainly circumscribed in the literature to material processes in English (cf. Davidse 1992, 1999), and contrasted with Spanish (Lavid and Arús 1998). However, its potential applicability to other process types is a matter of current research (Lavid and Arús in preparation). As a first contribution to this research, in this paper we will explore the functionalities of this fundamental distinction when applied to relational processes, thus providing a contrastive account which might be useful both for theoretical purposes and in applied areas such as MAT and MLG.

3. THE GRAMMAR OF RELATIONAL PROCESSES IN ENGLISH: A SYSTEMIC-FUNCTIONAL PERSPECTIVE

Within the theoretical framework provided by Systemic-Functional Grammar (SFG), relational processes can be of two types: *Attributive* or ascriptive and *Identifying* or equative, depending on the authors (see Halliday 1985, Matthiessen 1990, 1995). Each of the two types represent three kinds of relations: *Intensive*, *Possessive* or *Circumstantial.* In attributive processes "an attribute is ascribed to some entity" (Halliday 1985:113), whereas in identifying processes "one entity is used to identify another" (*Ibid.*). Intensive attributive processes ascribe or attribute a quality, called Attribute, to an entity, the Carrier, as shown in (7). In the possessive type, the attributive relationship is one of ownership; the Carrier possesses the Attribute, e.g. (8). In circumstantial attributive processes, the Attribute is a circumstantial element ascribed to some entity, the Carrier, as shown in (9).

(7)	John	is	a poet	(attributive & intensive)
	Carrier	Process	Attribute	
(8)	John	has	a car	(attributive & possessive)
	Carrier	Process	Attribute	
(9)	John	is	at a party	(attributive & circumstantial)
	Carrier	Process	Attribute	

In intensive identifying processes, on the other hand, something, the Identified, has an identity, the Identifier, assigned to it, as illustrated in (10a, b). Possessive identifying processes present the possession in the form of a relationship between the Identified and the Identifier, as in (11a, b). Finally, circumstantial identifying processes have a Circumstance taking the form of

a relationship of time, place, manner, etc, between the Identified and the Identifier; the circumstantial relationship in (12a, b) is one of time.

The reason why identifying processes have an additional variable regarding the functions of the participants is due to the fact that these processes not only have an entity which identifies another, but what the Identifier identifies can be either the Token by which it is represented (decoding direction), or the Value which it represents (encoding). The nuances that these combinations account for are not of special relevance for our goal in this study, therefore we will not delve into them. The fact that identifying processes present a relation of identity allows them to reverse the equation, as in (10-12). It is also important to remark that both attributive and circumstantial processes present further divisions, both in the attributive and the identifying modes, depending on whether the possession or the circumstance are expressed by the Process or by the Participants. Since we just want to exemplify in a general manner the different kinds of relational processes, those variants have not been included[5].

(10)	(a)	John Token/ Identified	is Process	the poet Value/ Identifier	(identifying & intensive: active & decoding)
	(b)	The poet Value/ Identified	is Process	John Token/ Identifier	(identifying & intensive: passive & encoding)
(11)	(a)	The car Token/ Identified	is Process	Peter's Value/ Identifier	(identifying & possessive: active & decoding)
	(b)	Peter's Value/ Identified	is Process	the car Token/ Identifier	(identifying & possessive: passive & encoding)
(12)	(a)	Today Token/ Identified	is Process	the second Value/ Identifier	(identifying & circumstantial: active & decoding)
	(b)	The second Value/ Identified	is Process	today Token/ Identifier	(identifying & circumstantial: passive & encoding)

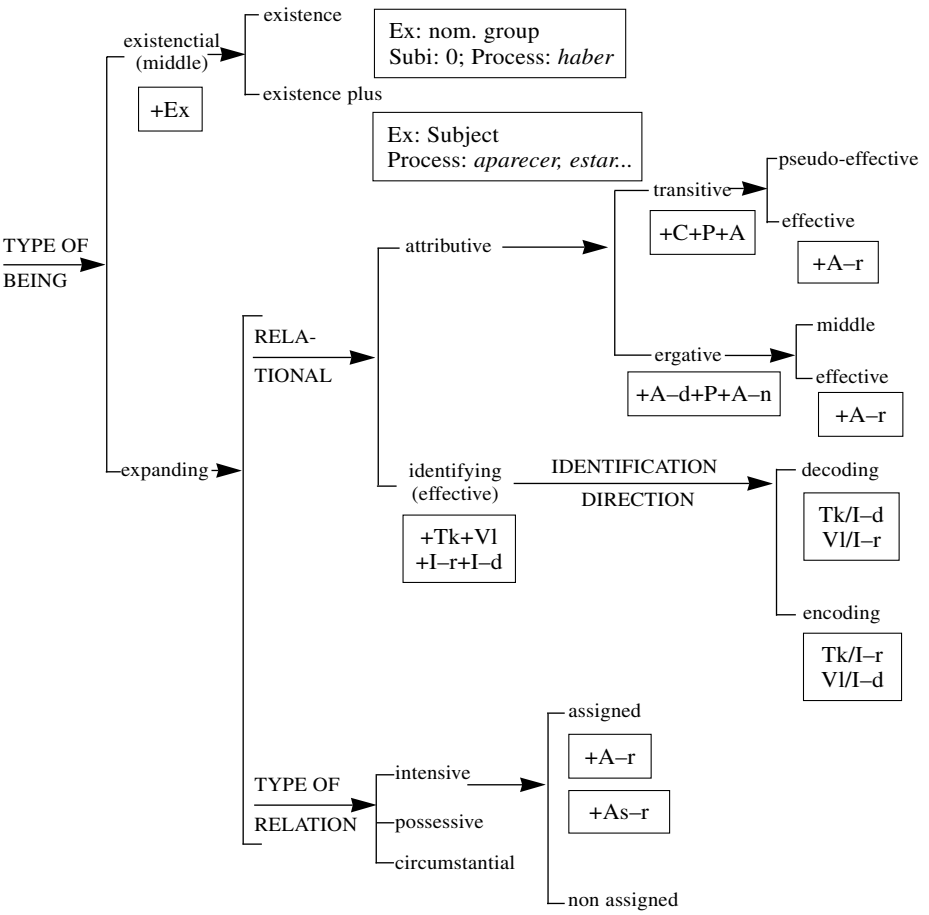
The identifying intensive type has been subject to reductions and extensions in the systemic literature. The paradigm on which Halliday (1985, 1994) relies is the so called 'four cell paradigm', which is the mutilated version of the 'eight cell paradigm' which was previously presented by himself (1967), and defended as the most appropriate one by other scholars (Davidse 1996). According to Davidse (1996: 371), it is important to account not only for the coding directionality and the voice of the identifying intensive process, but also for its "symbolic directionality, which can be 'upward', from the less to the more abstract symbolic stratum as in John (Tk) is the leader (Vl), or 'downward' from the more to the less abstract symbolic stratum as in The leader (Tk) is John (Vl)" [6]. Simplified versions, on the other hand, have been advocated by scholars like Fawcett (1987), who provides the major alternative description of relational processes to Halliday's. Fawcett (1987: 139) sees no reason to differentiate attributive processes from identifying ones. For him, the reversibility criterion wielded by Halliday as characterizing identifying processes is "no more than an accidental by-product of the equativeness of the nominal groups that fill the two roles". Halliday seems to be taking a turn in this direction, since in his second edition of *IFG* (1994: 167) he considers the possibility of analyzing decoding identifying processes in the same terms as attributive ones concerning the ergative functions of the participants [7].

Let this apparent digression from our main goal serve to illustrate the complexity of the semantics involved in relational processes. Such complexity is not fully grasped, though, if the transitive/ergative distinction is not included in the picture, as will be shown in the next section.

4. TRANSITIVITY/ERGATIVITY IN ENGLISH AND SPANISH RELATIONAL PROCESSES

In this section, we propose to study the relevance of the transitive/ergative distinction when applied to relational processes both in English and in Spanish. With that purpose in mind, we have designed a representation in the form of a system network, which captures the paradigmatic potential of relational processes in both languages when the transitive/ergative distinction is included as part of the functional features necessary for the correct generation of examples in both languages. The network, illustrated in Figure 3 below, is presented in a consolidated way for the sake of clarity [8], and includes existential processes, which are dealt with as "other process types" in Halliday (1985, 1994), but which are included among relationals in the grammar Nigel (Matthiessen 1990, 1995).

In this consolidated type of network, the three systems of ERGATIVITY, AGENCY, and PROCESS TYPE illustrated in Figure 2 above, have already



The abbreviations should be read as follows: C = Carrier; P = Process; A = Attribute; A-r = Attributor; A-n = Attribution; A-d = Attributed; Tk = Token; Vl = Value; I-d = Identified; I-r = Identifier; As-r = Assigner.

Figure 3. Relational Transitivity Network for English and Spanish

been traversed, and we are now at the point where the TYPE OF BEING system is entered. This system has two options, Existential or Expanding, and under Expanding, the systems of RELATIONAL Abstraction and TYPE OF RELATION. If we concentrate on the system of RELATIONAL Abstraction, we can see that, as a result of selections in the ERGATIVITY and AGENCY systems done before, attributive processes can be transitive, and, within these, pseudo-effective (example 13 below) or effective (example 14). The other

alternative for attributive processes is to be ergative, in which case they choose between middle (example 15) and effective (example 16).

Conversely, identifying processes are always transitive (example 17). There is a clear reason for this. Identifying processes, as we see in the network, are always effective (the Token is always Agent), whereas a relevant feature of ergative processes is that the same verb can take part in a middle and an effective process. If identifying processes are never middle, they cannot be ergative. Examples (13-17) include the different selection expressions from the network in Figure 3. The rest of the discussion concentrates on intensive processes.

(13) (a) The grass is green (relational: expanding: attribut. &
Carrier Process Attribute & inten. & trans.& pseudo-effect.)

(b) La hierba está verde
Carrier Process Attribute

(14) (a) The news made me happy (relational: expanding: attributive
Attributor Process Carrier Attribute & intensive & trans. & effective)

(b) La noticia me hizo feliz
Attributor Carrier Process Attribute

(15) (a) The grass turned brown (relational: expanding: attributive
Attributed Process Attribution & intensive & ergative & middle)

(b) La hierba se puso marrón
Attributed Process Attribution

(16) (a) The sun turned the grass brown (relational: expanding: attributive
Attributor Process Attributed Attribution & intensive & ergat. & effective)

(b) El sol puso la hierba marrón
Attributor Process Attributed Attribution

(17) (a) Nicholas was the winner (relational: expanding: identifying &
Token/Identified Process Value/Identifier & inten. & transit. & effect: decod.)

(b) Nicolás fue el vencedor
Token/Identified Process Value/Identifier

It is important to observe that we are assigning different names to participants in ergative attributive processes from the participants in transitive attributive ones, as can be seen in examples (13-15), regarding Attribute and Attribution. The reason for this is that the role fulfilled by those participants is different in each system. In the transitive system, the Attribute is a real participant. It is not so easy to test in English as it is in Spanish. For example, pronominal substitution of the Attribute with *lo* is possible in Spanish. Thus, the answer to a question like *¿Está verde la hierba?* can be *Sí,* ***lo*** *está*. This is not possible with the Attribution in ergative processes *–¿Se puso marrón?, *Sí (se) lo puso–* which leads us to consider it not as a participant function of its own, but rather as a complementation of the Attributed, the two of them making up the Medium of the process.

Examples (15) and (16) show the same pattern of ergativity as we previously saw in material processes (2): they maintain the same lexical realization for the verb in the middle (15) and effective (16) version of the same process. Also, in both (15) and (16) it is the grass that turns brown, the same as we saw in the material process (2), above, that it is the ball doing the bouncing both in the middle and the effective. It should also be observed that the Spanish versions in (15) and (16) reflect a typical feature of ergative processes in that language, namely the pronominalization of the verb playing the role of Process. Most ergative verbs do actually behave that way in Spanish, not only among relational processes, but also in material and mental:[9] *despertar(se), levantar(se), convencer(se), abrirse(se), cerrar(se), asustar(se)*, and many others.

Processes (13-17) are perfect matches in English and Spanish regarding the transitive/ergative distinction. However, for the transitivity/ergativity issue to yield fruitful insights in the domain of relational processes in application contexts such as MAT or MLG, we need to do the same as in the material examples (5) and (6) above. That is, we should compare processes that do not behave in equal transitive/ergative terms. Take, for example, the English relational process (18a) *They call me George*, which has a perfect match in Spanish (18b) *Me llaman Jorge*. This may lead us to think that this process follows the same path along the system network in both languages. Yet if we try to find a middle version for the effective process in (18), we run into important differences in both languages. Whereas there is no (19a) **I call George*, Spanish (19b) *Me llamo Jorge* is the logical middle counterpart of (18b). In order to get the right middle version of a process like (18a), as well as the appropriate translation to (19b), we need to resort to a change in the lexical realization of the verb functioning as Process: (20) *My name is George*. Processes (18-20) are analyzed below and their selection expressions specified.

(18) (a) They call me George (relational: expanding: attributive &
Assigner Process Tk/I-d Vl/I-r & intensive & transitive & effective)

(b) (Ellos) me llaman Jorge (relational: expanding: &
Attributor Attributed Process Attribution attributive & intensive &
ergative & effective)

(19) (a) *I call George
(b) Me llamo Jorge (relational: expanding: attributive &
Attributed Process Attributor & intensive & ergative & middle)

(20) My name is George (relational: expanding: identifying &
Vl/I-d Process Tk/I-r & intensive & transit. & effect.: encoding)

The analyses and selection expressions of (18-20) show that if the transitive/ergative distinction is not included in the network, the system could generate wrong translations, as (19a). By specifying in the lexicon that a Process like *llamar(se)* is attributive ergative and *call* is attributive transitive and effective, the generator will never try to provide a translation for the middle version of *llamar* with a middle version of *call*, since that option is excluded from the network.

5. LEXICAL DELICACY IN RELATIONAL PROCESSES

Once the transitive/ergative paradigms have been proved to be relevant for the accurate translation and generation of lexical pairs, this section concentrates on a second relevant issue for the correct generation and translation of relational processes in English and Spanish: lexical delicacy. In the computational environment we have used for the current study, any grammar fragment can be represented in system network notation until it reaches the last distinguishing grammatical feature, called the logical endpoint which is the last selection that can be made in the network before lexical realization.

As an illustration of this issue, we present a computational representation of attributive intensive processes in Spanish in the form of a system network in Figure 4.

The lexical realizations corresponding to the features of the network in Figure 4 show that, within attributive intensive relational processes, the

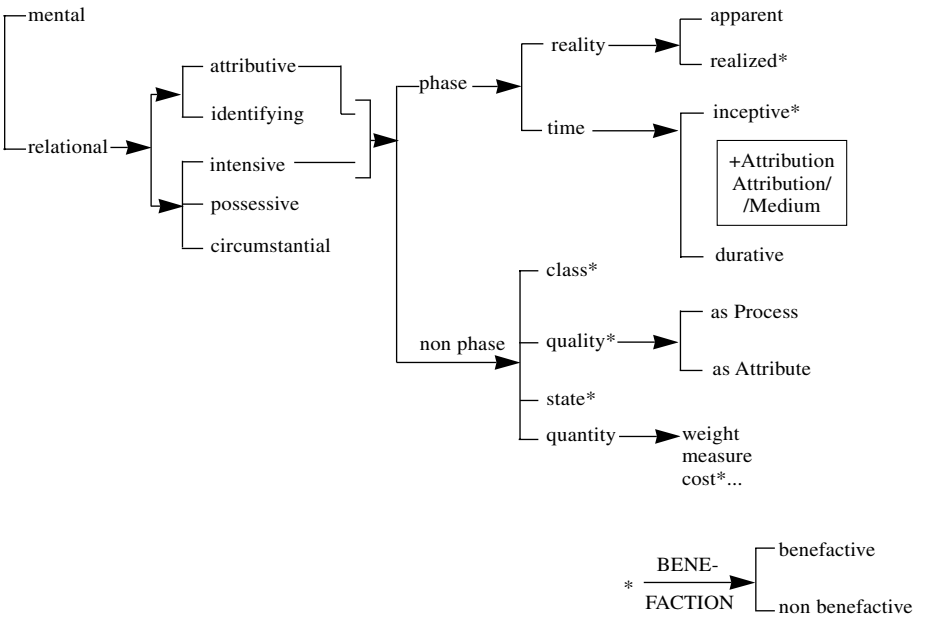


Figure 4. Semantic representation of attributive intensive relational processes

selection of [non phase] plus [state] leads us to the lexical realization in *estar*, as opposed to *ser*, which is the unmarked realization in the other logical endpoints within [non phase]:

Process: phase
reality: apparent (*parecer*)/realized (*mostrarse, revelarse*)
time: inceptive (*hacerse, volverse*)/durative (*seguir,continuar*)

Process: non-phase
quantity (*ser, costar/pesar/…*)
quality: as Attribute (*ser*)/ as Process (*importar, bastar…*)
class (*ser*)
state (*estar*)

We will also be able to isolate the only other realization in *estar* if we consider now the delicate network for attributive circumstantial relational

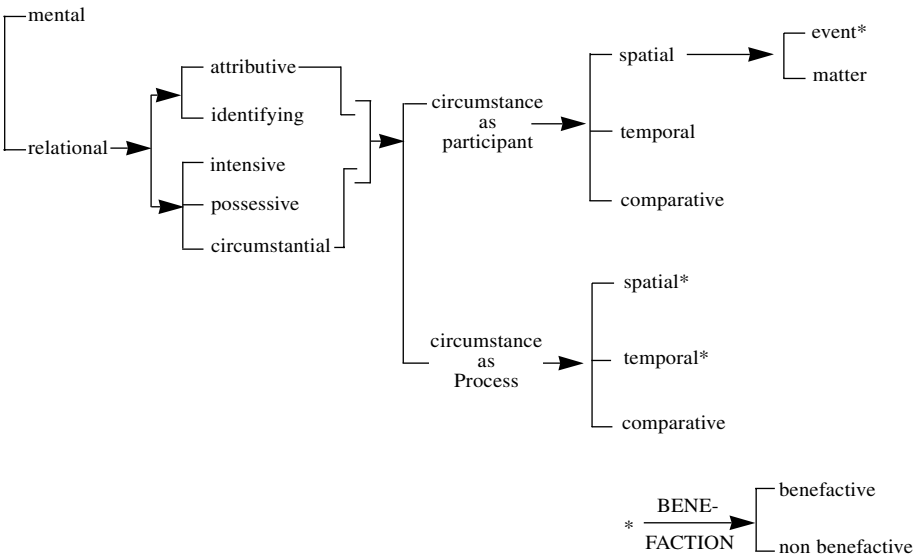


Figure 5. Semantic representation of identifying circumstantial relational processes

processes. The features selected would be [Circumstance as participant] followed by [spatial] and [matter], as shown in Figure 5.

The lexical realizations for these selections would be the following:

Circumstance as participant:

spatial: event (*ser, tener lugar, ocurrir*)/matter (*estar, hallarse, encontrarse*)
comparative: *ser*

Circumstance as Process:

spatial: *ocupar, abarcar, extenderse*
temporal: *ser, tener lugar, durar*
comparative: *parecerse*

The asterisks in both systems indicate that it is possible to choose between having Beneficiary or not, as in [intensive: class] *El libro (**me**) costó muy caro*.

The two delicate subsystems in Figures 4 and 5 allow us to identify the logical endpoints at which *estar* is the lexical realization of a given process. Examples (21) y (22) with their selection expressions offer the contexts in which *estar* is the required translation of *be*, whereas (23) presents a translation of *be* as *ser* in a semantic context very close to (22).

(21) (a)	Peter is fat	(relational: expanding: attributive & intensive & transitive & pseudo-effective: non-phase: **class/state**)
(b)	Pedro está gordo	(relational: expanding: attributive & intensive & transitive & pseudo-effective: non-phase: **state**)
(c)	Pedro es gordo	(relational: expanding: attributive & intensive & transitive & pseudo-effective: non-phase: **class**)
(22) (a)	Peter is at home	(relational: expanding: attrib. & circumst.& transitive & pseudo-effect.: circumst. as Partic.: spatial: **matter**)
(b)	Pedro está en casa	(relational: expanding: attrib. & circumst.& transitive & pseudo-effect.: circumst.as Partic.: spatial: **matter**)
(23) (a)	The party is at home	(relational: expanding: attrib. & circumst.& transitive & pseudo-effect.: circumst. as Partic.: spatial: **event**)
(b)	La fiesta es en casa	(relational: expanding: attrib.& circumst.& transitive & pseudo-effect.: circumst. as Partic.: spatial: **event**)

As we see in (21), the selection of the last feature determines the translation. If it is [state], the translation will be *estar*, which becomes *ser* if that feature is replaced with [class]. Examples (22) and (23) also illustrate how very delicate distinctions can be accounted for through the use of functional-systemic features. Both (22) and (23) refer to spatial Circumstance, but the inclusion of the feature [matter] (22) against [event] (23) determines the selection between one lexical realization versus another. The comparison of these two examples also shows the relevance that system networks may have in the field of Second Language Teaching. English speakers usually have great trouble to discriminate correctly the use of *ser/ estar* in cases like (22) and (23).

6. SUMMARY AND CONCLUDING REMARKS

In this study, we have shown how a revision of the traditional account of relational processes both in the computational Nigel grammar, and in the specification proposed for Spanish, yields a more accurate account of the linguistic behavior of this type of processes in both languages. This revision is based on a redefinition of the notion of "Agency" and on the introduction of a new system, i.e., ERGATIVITY, which, together with the system of PROCESS TYPE, results in a more complete specification of the grammar of relational processes in both languages, thus contributing to the generation of correct translations from one language into the other.

Another important issue in the specification of the grammar of relational processes is the delicate design of logical endpoints in the system network. Thus, English and Spanish share semantic systems at a less delicate level, but differ from each other when choosing the grammatical paradigms for the same process. The ultimate distinction, of course, is that of the lexical realization, since they are two different languages. The notion of "lexis as most delicate grammar" (*Cf.* Hasan 1987) has been proved to be operative and useful in the generation of the correct lexical choices in an MLG system.

This study, in conclusion, has tried to offer some guidelines for the correct design of relational transitivity networks, which could, in principle, be applied not only to translation but also to parsing or generation in general (*Cf.* Matthiessen and Nesbitt 1996: 77). Hopefully, the results of this initial investigation will be complemented with the study of other process types within the overall grammar of transitivity. This, however, is the matter of future research.

NOTES

[1] Multilingual generation has been recently proposed as a reasonable alternative to machine translation in computational linguistic circles, and for certain applications. Therefore, our discussion will be mainly centered in this field. The work reported in this paper has been financed by the Education Council of the Madrid Community as part of the project number 06/0084/1999 in the area of Humanities and Social Sciences.

[2] In transitive material processes, the Actor is Medium, i.e. the most nuclear participant, in middle category, whereas the Medium conflates with the Goal in effective processes. In ergative material processes, on the other hand, the Medium conflates with the Affected in both the middle and the effective categories, the Instigator being Agent in the latter.

[3] It is sometimes hard to say that processes like (3a) are incorrect in English. This can be put down to the increasing ergativization of English (Cf. Halliday 1994:163). Davidse and Geyskens (1997) also deal with the ergative causitivization of intransitives like *Have you walked the dog?*

[4] The reason why the system of AGENCY in Figure 2 presents an extra alternative, pseudo-effective, is due to the fact that we follow Davidse in the treatment of ranged structures as an

independent category. Thus, a process like (i) *Peter climbed the mountain* is pseudo-effective, since it has Range *the mountain*. In the ergative system, pseudo-effective structures are those of the type (ii) *Peter broke an arm*, with Setting-Subject *Peter*. For a full treatment of pseudo-effectives, see Davidse (1992, 1999).

[5] See Halliday (1985:125-7) for examples of the different combinations.

[6] See Davidse (1996) for a detailed study of the eight cell paradigm and its implications.

[7] In the first edition of IFG (Halliday 1985) attributive processes consist of Carrier/ Medium. Process. Attribute/Range, versus a Token/Agent. Process. Value/Medium configuration inidentifying. In the second edition of the same grammar (1994), decoding identifying may be analyzed as consisting of Token/Medium. Process. Value/Range. For the most part, we are not including those conflations in the examples used in our paper in order to avoid a terminological overload.

[8] For the notions of consolidated versus displayed networks, see Fawcett (1988:14-8).

[9] Verbal processes are the only ones not presenting ergative realizations, both in English and Spanish.

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