

## On Spanish dvandva and its restrictions

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*Abstract.* As noted by Bauer, real dvandva compounds –that is, coordinative compounds that properly express the aggregation of two different entities, not the intersection of properties in one entity– are extremely rare in English or Spanish. This article explores the empirical domain of dvandva compounding in Spanish, and notes that they are productive when not used as heads within their phrases. We propose that the explanation for this is that Spanish can only productively build dvandva compounds using flat structures without internal hierarchy. This causes the compound to look externally for a head noun that defines the interpretation of the relation established between the two members of the dvandva. The proposal also explains why proper names is preferred in dvandva compounding, given that they do not denote properties.

**Keywords:** compounding, dvandva, juxtaposition, relations, coordination

### 1. Introduction: what is a real dvandva?

Perhaps the main task of a linguist is to describe the range of variation in human language and attempt an explanation of why some combinations that one should expect possible are in fact impossible, sometimes universally, sometimes within specific languages.

A good specific example of this is the interpretation of compounds. Since Downing (1977), the idea that Noun-Noun compounding (henceforth, N-N) allows virtually any type of interpretation has become quite widespread (but see Rainer, 2013, in the context of the discussion on relational adjectives). The example in (1) has become quite famous in this respect (cf. Gleitman & Gleitman, 1970; Allen, 1978; Brekle, 1986; Sadock, 1998; Jackendoff, 2010; and the works included in Ten Hacken, 2016).

- (1) bike girl  
'girl with a bike'  
'girl that was biking now'  
'girl that likes bikes'  
'girl that looks like a bike'  
...

This claim works well as an initial observation about the allowed ranges of readings in compounding, but it makes the impossible interpretations all the more relevant and interesting for the linguist.

In one of his many significant contributions, Bauer (2008: 4-11) notes that dvandva interpretations of compounds are astonishingly rare in languages such as English, German or Spanish. Here Bauer identifies precisely the type of restriction that goes to the core of the linguist's task: why would a structure that in general seems very underspecified in terms of interpretation impose a strict ban on one particular meaning relation?

As Bauer (2008) underlies, dvandva is distinct from coordinative compounds (Bisetto & Scalise, 2005) whose distinguishing property is that the whole compound is interpreted as a new unity composed of the two entities named (Bauer, 2008: 2). An example like (2) would not count as a dvandva compound because the whole does not express a set of two individuals, one a poet and one a painter, but one single individual performing the typical activity of both poets and painters.

- (2) poet painter

The term *dvandva* comes of course from Sanskrit, where it was initially used with proper names, particularly in order to express dual divinities (3; cf. Wackernagel, 1905: §62-63), and at the initial stages it triggered dual or plural agreement, becoming singular at later stages in a process of grammaticalisation, allowing in a productive way also common nouns (4) (Whitney, 1924: §1252).

- |     |                         |                |
|-----|-------------------------|----------------|
| (3) | a. <i>mitrā-váruṇau</i> | 'Mitra-Varuna' |
|     | b. <i>ahura-mithra</i>  | 'Ahura-Mitra'  |
| (4) | <i>āpa-urvaire</i>      | 'water-plants' |

The goal of this contribution is quite modest. Our goal will be to concentrate on one particular language, Modern Spanish, and take the current snapshot of *dvandva* compounding within this language. Spanish is chosen because it is a good example of a language with restricted compounding: its restrictive character will allow us to see what is at the core of *dvandva* structures. We will provide a description using data of all available varieties that come both from corpora and data elicitation (section 2), and then try to provide some partial explanations of why *dvandva* favours proper names (section 3), and the conditions under which *dvandva* can be heads (section 4). Our goal here is not to advocate for a specific implementation of the generalisations, but rather to identify some generalisations that could be further integrated in different analyses, be it from a Neo-Constructionist perspective (Halle & Marantz, 1993), a Construction Grammar perspective (Booij, 2010) or another type of theory.

## 2. A snapshot of *dvandva* nominal compounds in contemporary Spanish

In this section, we present the empirical facts about *dvandva* in Spanish. Unless otherwise noted, the data come from Mark Davies' *Corpus del Español* and RAE's *CREA*, which contains written and oral texts from all geographical varieties of Spanish. We have restricted the domain to contemporary examples. In the cases where it was necessary to check whether a gap in the corpus data was accidental, native speakers –from European Spanish, plus several speakers from Venezuelan, Peruvian and Argentinean Spanish– have been tested. Although the corpora tend to contain always a higher number of European Spanish texts, we have not identified any significant dialectal variation in this area of word formation.

Proper names are typical sources of *dvandva* (see Bauer, 2008: 4-11; Koptjevskaja-Tamm, 2009) (5). Crucially, *dvandva* compounds containing proper names can be heads within nominal phrases.

- |     |                    |
|-----|--------------------|
| (5) | a. Austria-Hungría |
|     | Austro-Hungary     |
|     | b. Castilla-León   |
|     | Castile-León       |

When the *dvandva* is the modifier of another noun, it can be formed of two proper names (6), but it can also involve common nouns (7), or relational adjectives corresponding to those nouns (8).

- |     |                                      |
|-----|--------------------------------------|
| (6) | a. <i>conflicto Palestina-Israel</i> |
|     | conflict Palestine-Israel            |
|     | b. <i>ruta Madrid-Valencia</i>       |
|     | route Madrid-Valencia                |
| (7) | <i>relaciones madre-hijo</i>         |
|     | relations mother-child               |

- (8) a. conflicto palestino-israelí  
 conflict Palestinian-Israeli  
 b. relaciones materno-filiales  
 relations materno-filial

Significantly dvandva compound involving two common nouns cannot be used as the head of the structure. An example like (9) are unattested in corpora and rejected by all native speakers consulted.<sup>1</sup>

- (9) \*El madre-hijo define una relación difícil.  
 the mother-child defines a relation difficult  
 \*'Mother-child defines a difficult relation'

### 2.1. Dvandva as heads

There is very little to add to the description in Bauer (2008) for the class of dvandva compounds that can be used as heads within their phrases. The two main groups in Spanish are geographical names obtained by the addition of two previously independent territories (10) and names of companies or institutions that were created by merge of two previous companies (11a) or that were founded by several individuals in cooperation (11b).

- (10) a. Schleswig-Holstein  
 b. Castilla-León  
 Castile-León  
 (11) a. PricewaterhouseCoopers  
 b. Hewlett-Packard

A potential counterexample noted by Bauer (2008) is geographical reference directions, like *norte* 'north', *sur* 'south', *este* 'east' and *oeste* 'west'. Reference directions are not proper names, as witnessed by the fact that in Spanish they cannot act as preverbal subjects without article (cf. Fernández Leborans, 1999) (12), but they can be combined acting as the head of the noun phrase (13).

- (12) \*(El) norte está por ahí.  
 the north is over there  
 'North is over there'  
 (13) a. sur-oeste  
 south-west  
 b. nor-este  
 north-east

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<sup>1</sup> A reviewer points to me the existence of an example like (i), found in a blog through Google:

- (i) Madre-hijo es una conexión natural  
 mother-son is a connection natural  
 'Mother-son is a natural connection'

Speakers consulted find this example ungrammatical, and only marginally accept it if 'madre-hijo' is interpreted as citative, as a proper name. Note that the dvandva form this example is an instance of a preverbal subject without a determiner, something that in Spanish is ungrammatical unless the subject is a proper name. Excluding the possibility that this is a typo in writing a spontaneous text, this should point out to a recategorisation of the frequent 'mother-son' dvandva as a name directly referring to a relation.

These, however, are not dvandva, because as Bauer (2008: 10) notes, the resulting combination does not express the addition of the two directions, but a compromise between the two.

Perhaps the most crucial observation with respect to dvandva used in the position of head is that they are almost not productive in Spanish, particularly when we contrast them with dvandva used as modifiers of a noun. In geographical names, *Castilla-León* and *Austria-Hungría* are the only example that is clearly created in Spanish, while the others correspond to names of territories that come from other languages. Even in these cases, *Castilla-León* alternates with the overtly coordinated expression *Castilla y León* 'Castile and León': in CREA –the Reference Corpus of Contemporary Spanish of the Academy of Language– *Castilla y León* appears 9057 times, while *Castilla-León* appears 172 times. As for *Austria-Hungría*, it alternates with the phrase *Imperio austrohúngaro* 'Austro-Hungarian empire', both being roughly equally frequent in the corpus. When it comes to names of companies and institutions, again, the usual cases refer to foreign companies and we could not identify clear cases formed in Spanish. The conclusion is that the use of dvandva as heads of noun phrases is severely restricted in Spanish, almost exclusively reduced to borrowings from other languages.

## 2.2. Dvandva as modifiers

For Spanish, I have identified four relevant classes that depend on the meaning of the head noun. The first two classes are already noted by Bauer, and allow both proper names and common nouns.

A quite productive class is the one where the head noun denotes an event that imposes or allows a reciprocal interpretation of its participants (14), which Bauer calls co-participant compounds. Some of these nouns are deverbal, while others such as *diálogo* 'dialogue' or *conflicto* 'conflict' are not.

- (14)
- a. pacto Ribbentrop-Molotov  
pact Ribbentrop-Molotov
  - b. relaciones chico-chica  
relations boy-girl
  - c. comunicación médico-paciente  
communication doctor-patient
  - d. conflicto México-Estados Unidos  
conflict Mexico-USA
  - e. negociación España-Francia  
negotiation Spain-France
  - f. discusión gobierno-oposición  
discussion government-opposition

In the case of common nouns, the general tendency is to use nouns that are naturally related to each other by their conceptual meaning, typically the two poles of a kinship (15) or social (16) relation, or opposite values for the same type of entity; these types of relations are also attested significantly in co-compounds (cf. Wälchli, 2005).<sup>2</sup>

- (15)
- a. relaciones madre-hijo  
relations mother-child
  - b. relaciones abuelo-nieto  
relations grandfather-grandchild

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<sup>2</sup> In fact, see also Wälchli (2015: 718), where it is argued that natural coordination is also a relevant component in the dvandva using proper names.

- (16) a. relaciones empleado-empleador  
relations employee-employer
- b. relaciones abusador-víctima  
      relations abuser-victim
- (17) a. relaciones hombre-mujer  
      relations man-woman
- b. relaciones chico-chica  
      relations boy-girl

The second class noted by Bauer, traslative compounds, involves the coordination of two geographical names, which are related to each other as the initial and final point of a movement path. The head nouns are typically nouns denoting paths (18), or vehicles that follow those paths (19).<sup>3</sup>

- (18) a. la ruta Madrid-Barcelona  
      the route Madrid-Barcelona
- b. la carretera Madrid-Chinchón  
      the road Madrid-Chinchón
- (19) a. el autobús Madrid-León  
      the bus Madrid-León
- b. el tren Barcelona-Badalona  
      the train Barcelona-Badalona

Even though it is less frequent, it is also possible to denote 'temporal paths', that is, time periods obtained by adding the period corresponding to each one of the members of the dvandva compound. (20) refers to a time period that extends from the early fall to the end of the winter.

- (20) temporada otoño-invierno  
      season fall-winter

The third class involves head nouns that express collective entities, with or without a particular cardinality value. *Par* 'pair' involves two entities, while *familia* 'family' or *grupo* 'group' express indefinite pluralities. In such cases the members of the dvandva compound are plainly interpreted as the entities that compose the collectivity.

- (21) a. familia González-Pérez  
      family González-Pérez
- b. federación Guatemala-Nicaragua-Honduras  
      federation Guatemala-Nicaragua-Honduras
- c. par letra-número  
      pair letter-number

The fourth and final group that I have been identified is slightly more eclectic in terms of the nature of the head noun. Most of the nouns denote representation of information, generally

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<sup>3</sup> Bernhard Wälchli (p.c.) points out to us that cases where the trajectory is interpreted metaphorically are also possible, something confirmed by native speaker intuitions. In (i), the transformation involves a metaphorical path whose starting point is the caterpillar and the endpoint is the butterfly.

- (i) el proceso de transformación oruga-mariposa  
      the process of transformation caterpillar-butterfly

within scientific theories, such as *teoría* 'theory', *hipótesis* 'hypotheses', *conjetura* 'conjecture' or *generalización* 'generalisation', and the dvandva compound is interpreted as the different individuals that co-produced that scientific representation, or that reached it through independent means. However, other head nouns are possible (cf. 22d) provided that they represent entities that are part of said theories. (22d), for instance, refers to a particular state of matter that was hypothesised in joint work by Bose and Einstein. The noun *temática* 'issue' can also be found in such cases.

- (22) a. hipótesis Sapir-Whorf  
       hypothesis Sapir-Whorf  
       b. generalización Chomsky-Borer  
       generalisation Chomsky-Borer  
       c. conjeturas Hardy-Littlewood  
       conjectures Hardy-Littlewood  
       d. condensado Bose-Einstein  
       condensate Bose-Einstein

There are two generalisations to make about these four classes of dvandva compounds used as modifiers. The first one is that, necessarily, the two (or more) members of the dvandva have to be interpreted as holding a particular relation with each other, be it a reciprocal interaction in an event (class 1), codefining a bound path (class 2), codefining a collectivity by aggregation (class 3) or coauthoring a particular representation (class 4). The second one is that the interpretation of the relation is entirely subject to the nature of the head noun they modify: head nouns denoting events impose reciprocal interaction readings, nouns related to spatial (or temporal) paths impose the codefinition of a path interpretation, nouns denoting collectivities impose the pure aggregation reading, and the objects that denote theoretical proposals or the objects contained in them impose the reading that the two entities collaborated in producing that representation. The reading of the two members of the dvandva, then, directly reflect the type of relation introduced by the head noun.<sup>4</sup>

### 3. On why proper names are privileged in dvandva.

Even in the early stages of Sanscrit, dvandva favours proper names. In this section we will discuss why this should be the case. Our explanation will first be stated in terms that are as theory-neutral as possible, and we will leave a particular technical formulation for section 5.

Following Bauer (2008), the main property of dvandva as opposed to other coordinative compounds is that dvandva expresses the aggregation of two different individuals inside a set, not the intersection of two distinct entities in one single referent. As an illustration, consider the combination of two nouns in (23).

- (23) chico-chica  
       boy-girl

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<sup>4</sup> In evaluating these cases, it is important to control for discourse N ellipsis, which might give the surface impression in some cases that the dvandva is acting as the head of the structure. A reviewer observes the following example:

- (i) El nicho de mercado para este servicio en el Madrid-Barcelona es muy grande.  
       the niche of market for this service in the Madrid-Barcelona is very big  
       'The market niche for this service in the Madrid-Barcelona [train] is very big'

Notice that nothing in the proposal prevents the head noun from undergoing discourse ellipsis within texts where the denotation of the noun would be recoverable.

The dvandva interpretation implies three steps: first, define an individual that is characterised by the properties described by 'boy'; second, define a second individual that is characterised by the properties of 'girl'; third, create a set that contains both the first and the second individual, and nothing more. The result is that the compound expresses a group formed by a boy and a girl that are in some type of relation with each other –depending on the head noun the compound modifies–. Coordinative compounds, in contrast, would involve the intersection between the denotations of both members within a single referent.

At this point, it becomes relevant to remember that noun phrases have two distinct functions, as discussed in formal semantics since at least Frege (1892) –see also Russell (1905), and in more recent times Barwise & Cooper (1981)–. On the one hand, a common noun defines a predicate through a set of properties that are expressed in its lexical content. What we call 'dog' is an entity that is identified by the set of characteristics that we associate to dogs, and the noun 'dog' acts as a predicate to the extent that it denotes the set of entities that fulfill those properties. On the other hand, a common noun is able to introduce a referent, and is endowed with an index of identity that allows the speaker to make statements of sameness or difference with respect to an entity that is classified as a 'dog' (Baker, 2002). Adjectives, like nouns, contain a predicative part because they denote sets of properties, but they are differentiated from nouns in that they lack the index of identity that is a prerequisite to identify a referent for 'dog'. In other words, it is possible to talk about 'the same dog' or 'a different dog' precisely because 'dog' can identify a referent, but it is impossible to talk about 'the same tall' and 'a different tall' because the properties of adjectives do not carry identity with them.

Thus, we have two parts in a common noun like 'dog':

- (24) a. a set of dog-properties  
b. an index of identity that makes it possible to talk of different individuals that satisfy the set of dog-properties

Importantly, the contrast between dvandva and other coordinative compounds can be operationalised through these two levels of meaning. A coordinative compound involves combining sets of properties (that is, the meaning in 24a); a dvandva compound involves combining two distinct individuals which in principle carry different indexes of identity (that is, they involve combining the meaning in 24b).

The empirical fact is that dvandva is severely restricted in a language like Spanish. We propose that this restriction should be seen from the perspective above: Spanish has a tendency to prefer combination of properties when producing NN compounds, as noted by the preference for compounding involving the predication of properties (Varela, 1990), and not the combination of indexes of identity.

So what happens with proper names? There is a central fact about proper names that I believe should be taken as a starting point to distinguish them from common nouns: proper names are nominal expressions that are referential by themselves and lack a predicative part (see among many others Donnellan, 1966; Evans, 1973; Kripke, 1980; Salmon, 1981; Recanati, 1983; Lewis, 1986; Fernández-Leborans, 1999 for discussion). In logical terms, the proper name itself expresses an entity of type  $\langle e \rangle$ , a constant, that satisfies the argument position of a predicate. Being of type  $\langle e \rangle$  itself, it lacks a predicative part, which would be of type  $\langle e, t \rangle$ . Consider the consequences of this.

Descriptivist theories of proper names –also known, fittingly for this article, as the Frege-Russell theory (Russell, 1905)– argue that proper names are of type  $\langle e, t \rangle$ , so that a proper name denotes whatever facts about the reference singularise him or her in a wider context.

- (25) a. Donald Trump  
b. el presidente de EEUU en 2019  
the president of USA in 2019

However, the descriptivist theory runs into troubles pointed out by Kripke (1980). If the meaning of *Aristotle* was a set of properties, any copular sentence that uses the proper name as the subject and one of such properties as the predicate should be a tautology. If *Aristotle* meant 'the philosopher that taught Alexander', then the sentence in (28) should be a trivial statement, because it would equal 'The philosopher that taught Alexander was the philosopher that taught Alexander', which is not how a speaker feels about the proposition.

- (26) Aristóteles es el filósofo que enseñó a Alejandro Magno.  
Aristotle is the philosopher that taught ACC Alexander Great

Kripke (1980) argued that a proper name is assigned to a referent in what he calls an 'initial baptism' where the name becomes a rigid designator for that individual. This theory of reference is causal: the referent is associated to the proper name in that ceremony. In other words, a proper name is differentiated from a common noun in that it does not carry a set of properties with it: they are the opposite of adjectives, which lack an index of identity and express a set of properties.

Assuming the theory of rigid designators is right, then the privileged status of proper names inside dvandva is naturally explained. Dvandva requires a combination of two indexes of identity, something that is a marked option in a language like Spanish. The reason that this is a marked option is that Spanish tends to combine sets of properties within NN compounds. In the case of proper names, they lack a predicative part, so there is no set of properties that can be combined: naturally, then, to the extent that two proper names can be combined at all in the language, the dvandva interpretation will be the only available meaning in such cases. A Spanish speaker will then overcome the tendency to avoid combinations of two indexes of identity because the alternative would be even worse: to leave a combination of units without any interpretation.

However, this does not explain still why dvandva is more productive as a modifier than as a head of a phrase, or what happens in the cases where dvandva is composed of common nouns. This will be discussed in the next section.

#### **4. Dvandva as modifiers and the building of relations as a last resort**

We have hypothesised that the main problem to build dvandva in Spanish is that there is a strong tendency to interpret the compound as combining two sets of properties, not two indexes of identity, thus triggering a coordinative non-dvandva interpretation where the properties of each member intersect on the same entity. Building on this idea, I propose that in order to avoid this interpretation, Spanish chooses to interpret the compound externally, using the head noun modified by dvandva establish the relation between the two members of the compound. Specifically, because the relation between the two members of the compound would be interpreted as property intersection internally to the compound, dvandva requires that this relation is defined outside the linguistic material of the compound.

The head noun, for this reason, is responsible for establishing the proper relation between the two individuals inside the dvandva. This explains that the four classes show a correlation between what the head noun means and the type of relation that characterises the two (or more) members of the dvandva. In this sense, the use of the head noun –linguistic material outside the compound– to define the interpretation of the compound is a last resort mechanism. On the standard assumption that all linguistic structures must be assigned an interpretation, and



because the dvandva reading cannot be obtained in the internal interpretation of the compound, Spanish resorts to the strategy of letting the head noun determine what kind of relation should be assigned to the members of the dvandva structure. It follows, then, that dvandva will be preferred in a modifier position because only in that position is the dvandva able to use external material in its immediate context to build an appropriate interpretation.

Being slightly more technical, our proposal is that dvandva –both in head and in modifier position– involve a juxtaposition between the two elements. Juxtaposition here should be interpreted by opposition to any other type of structure that combines the two elements using overt or covert additional linguistic material, such as linking elements, relational heads or projecting one of the two members of the dvandva as the head. This, we argue, is intuitively perceived by the speaker, who tends to represent the relation orthographically through a dash '-', marking a direct combination between the members of the structure without the intermediation of further material.

Juxtaposition, interpreted as merging two elements without defining one as a head or using intermediate heads to combine them, merely combines two elements that are at an identical level. This absence of complex structure is what prevents the normal interpretation of the compound as combination of sets of properties. The downside is that this juxtaposition does not define any particular relation between the nouns, because it does not build new structure at all. The absence of a specific interpretation naturally triggered by the juxtaposition in (27) is, at the same time, what makes it necessary to interpret the structure externally, through the meaning of the head noun (27).

(27) [DP las relaciones [[N madre]-[N hijo]]]  
           the relations       mother - child

If the dvandva composed of common nouns is the head inside its projection, the result is a structure that cannot be assigned any interpretation, because within the noun phrase there is no further material hierarchically superior to the dvandva that defines an appropriate relation, or headedness, and the structure lacks an external noun that could define an external interpretation. Such cases are excluded from corpora, and the native speakers consulted also reject them.

(28) \*El [N madre]-[N hijo] es importante.  
           the mother child is important

In the case of proper names, we have already argued in the previous section that there are good reasons to believe that they do not carry a set of properties with them. This opens a second possibility for them in terms of the structure used to combine them. In the (relatively few) cases where Spanish allows the dvandva to act as the head inside its projection, we propose that then the two proper names are combined in the usual structural way for coordinative compounds. The coordinative non-dvandva interpretation involving intersection of properties is automatically blocked by the simple fact that neither of the two members has properties that could intersect with each other. The natural interpretation for proper names is, predictably, one of aggregation, which accounts for the meaning of *Austria-Hungría* 'Austria-Hungary'.

Thus, and to be clear, dvandvas used as modifiers involve flat structures without head, and therefore absence of any compound-internal relational reading. Dvandvas involving proper names, on the other hand, can be taken as coordinative compounds thanks to their lack of denotative properties, and instead they are interpreted –as Bauer (2008) emphasises– as the aggregation of the referents of each member.

This theoretically-neutral proposal is, we believe, sufficiently explicit to make some testable predictions. There is one that is quite interesting, in our opinion: if it is true that dvandvas used

as modifiers must get the relation between its members interpreted externally, using the semantics of the head noun for that, it must be the case that dvandvas will be ungrammatical if the head noun does not satisfy this requisite.

There are several ways of not satisfying the requisite. Remember at this point the four classes of head nouns involved:

- (29) Semantic types of heads that combine with dvandva as modifiers
- a. nouns expressing reciprocal events
  - b. nouns denoting paths bounded by the members of the dvandva
  - c. collective nouns obtained by aggregation of units
  - d. representation nouns that have an author

Starting from the first class, we predict that nouns that express events that do not involve reciprocal events will be out in the construction, because they do not provide a relation that can involve two entities that –because of juxtaposition– are at the same level with respect to each other. This prediction is borne out. (30a) is an example of an event that only has one participant; (30b) is an example of an event that has two participants, but where the reciprocal interpretation is not part of its semantics. We found no such cases in corpora, and the native speakers consulted reject them.

- (30) a. \*una llegada madre-hijo  
an arrival mother-child  
b. \*una lectura madre-hijo  
a reading mother-child

In the second class, the two members of the dvandva codefine a path: one is the starting point of the movement, the other is the arrival point. If instead of a noun that denotes a path we have a noun that denotes a stative location, it is impossible to build an interpretation where the two members of the dvandva are at the same level of hierarchy and interact with each other. The dvandva would not be satisfied, as the head noun fails to satisfy the requisite of imposing an external relation. This prediction is, again, borne out using the methodology mentioned above.

- (31) \*un punto madre-hijo  
a point mother-child

In the third class, the collectivity defined by the head noun is codefined by the two members or the dvandva: one alone would not be able to define a collective. This predicts that if the noun denotes a set that must be a singleton the dvandva will not be satisfied –trivially, perhaps–. This is confirmed, unsurprisingly, even though there is a strong tendency among speakers to accommodate the noun so that it can denote the aggregation of two entities that is conceived as one undivided object that acts as a unit.

- (32) a. #un átomo madre-hijo  
an atom mother-child  
b. #una unidad madre-hijo  
a unit mother-child

For instance, (32b) could be interpreted in the context of a psychology textbook to convey the idea that the union between a mother and a child is so strong that for practical purposes they

act as one single organism. In practice, then, the head noun has been reassigned a contextually-imposed collective interpretation.

In the fourth class, representation nouns, the crucial property is that the head noun must denote a human-produced object. The prediction, then, is that if we try to substitute these nouns for natural objects that are not related to authorship (see the notion of 'natural object' vs. 'artifact' in Pustejovsky, 1995), the dvandva will not be satisfied, because the co-authoring interpretation would not be available. This is again confirmed; unless one stipulates through pragmatic accommodation that the 'water' in (33a) is actually an artificial object produced in the lab –and therefore potentially created or proposed by two scientists–, the dvandva cannot be interpreted.

- (33) a. \*el agua Newton-Leibniz  
the water Newton-Leibniz  
b. \*la piedra Copérnico-Galileo  
the stone Copernicus-Galileo

Thus, there are reasons to believe that the proposal made here is not completely mistaken: the head noun determines whether the dvandva used as a modifier is grammatical or not. It is not implausible, then, to think that the reason is that dvandvas are used as modifiers in order to allow for an external interpretation of the relation between the two units.

## 5. Conclusions

In this article we have explored the range of constructions and interpretations where Spanish allows nominal dvandva compounding. We have seen that dvandva is pretty restricted in Spanish, in two senses: used as heads, there are only some cases always restricted to proper names; used as modifiers they are dependent on the semantics of the head noun that combines with them to specify the semantic relation between the two components. We have argued that behind this pattern there is a general tendency of Spanish to interpret a coordinative compound as implying the intersection of two sets of properties in the same entity, which is at odds with the interpretation of dvandva. Proper names avoid the unwanted reading to some extent, because they do not denote sets of properties, but common nouns have no way to avoid it unless the compound avoids building new structure. Thus, dvandva formed by common nouns involve flat structures without any hierarchical definition, which has as a consequence that they depend on a head noun to get an interpretation assigned.

There are many aspects of dvandva that we have not explored here, among others their relation with co-compounding (Wälchli 2005), at least in terms of the different predictions made by each one of the views, and their restrictions with adjectives or nouns, but at least we hope to have been able to describe a fragment of their grammar in this article, and more importantly to have shown the significance of Bauer's work in the study of dvandva as the first person to notice how these compounds posed new questions to the field.

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