Coordinated Adjectives and the Interpretation of Number Features

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1. Introduction*

There seems to be a general agreement on the fact that (1) is true:

(1) Number features are interpretable in nouns and pronouns, not elsewhere.

In this paper I will analyze some strong counterexamples to (1). I will argue that number features in coordinated adjectival structures determine the cardinal interpretation of DPs in some cases, but not in others. The difference depends both on the lexical classes to which adjectives belong (specifically, so-called relational or classifying vs. qualifying adjectives) and the syntactic configurations obtained. I will present an analysis of the relevant coordinate structures which will be able to maintain (1). The data that I will analyze in this paper are from Spanish, but I believe that the phenomenon and the analysis can be naturally extended to other Romance languages.

2. The problem

I will take coordinated structures to be projections of the conjunction, as argued by Munn (1993), Zoerner (1995), Camacho (2003) and others. The

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conjunction and is thus the head of John and Mary, a “and phrase” (&P). There is not such an agreement of how exactly the number features of this &P projection are obtained. One possibility is that a Number projection is above &P, as claimed by Sauerland (2003), which means that Number selects for and. Another option is that abstract number features are assigned to the &-head as a part of the computational process. These two analyses are probably rather close. However, it is worth pointing out that most (if not all) maximal projections can be coordinated, but number features are interpretable only in some of them. I will thus take the second option as a preferable alternative. Let us put forward what one might call “the null option”:

(2)  A coordinated plural phrase can be made out of two or more singular expressions if and only if their respective number features are interpretable.

Notice that (2) describes a computational process. It says that non-interpretable singulars cannot be “summed up” to obtain a plural, since only interpretable singulars can. This analysis makes a number of empirical predictions, but also entails some unexpected problems that one must deal with. Consider the predictions first.

The verbal form are in John and Mary are happy has (non-interpretable) plural features because the &P John and Mary has (interpretable) plural features. Let us suppose that it gets them by summing up two singular features, as postulated in (2). Notice that we predict the fact that number features cannot be summed up in coordinated VPs (in fact, coordinated IPs, since verbs are inflected), because these number features are not interpretable. Thus, there is not a possible counterpart of (3a) in which an IP with plural features is made up out of two singulars:

(3)  a. Estos dos niños estudian y juegan.
    ‘These two children study and play’
 b. *Estos dos niños estudia y juega respectivamente.
    ‘These children study and play respectively’
c. Este niño estudia y juega.
    ‘This child studies and plays’

The irregularity of (3b) is then straightforwardly derived from (2). As for (3a), we still need to say that estudian y juegan is a projection with plural features, although non-interpretable. Since the conjunction y is its head, and estudian is (arguably) its specifier, we may say that the plural features of
estudian y juegan are obtained through spec-head agreement in the coordinated phrase:

(4) The &° head of a &P receives plural features by spec-head agreement.

The same result is obtained in (3c), in which estudia y juega is a projection with singular features which agrees in number with the subject este niño. Certainly, something would have to be added to (4) to assure identity of number features (and not tense features, for example) in coordinated I’s, but my main concern is this paper will not be (4), but (2), which has more interesting consequences. Notice that (2) is not affected by (3a) or (3c). I will simply take (4) to be a blind process, whereas the computation to which (2) refers is—I will argue—sensitive to other grammatical properties of the categories involved.

It also follows from (2) the fact that two singular determiners cannot be coordinated to agree with a plural noun, since f-features in determiners are not interpretable. The noun turista (‘turist’) is chosen in (5) because it can be masculine or feminine, and so gender agreement is not affected by the coordination process:

(5) a. El turista y la turista
    ‘The turist and the turist’

b. *El y la turistas
    ‘The turists’

c. *Este y aquel turistas
    ‘This and that turists’

Another natural consequence of (2) is the fact that two coordinate singular nouns can agree with a plural adjective, whether the latter is a modifier (6a), it appears in a copulative sentence (6b), or in a secondary predication structure, as in (6c):

(6) a. Una camisa y una falda amarillas
    ‘A yellow shirt and a yellow skirt’

b. El vino y la cerveza están fríos.
    ‘The wine and the beer are cold’

c. Quiero bien fríos el vino y la cerveza.
    ‘I want (both) wine and beer to be very cold’

The adjectives amarillas and fríos have plural features in (6), which are triggered by their nominal subjects. Notice that the opposite situation is not
possible, as predicted by (2). That is, two singular qualifying adjectives cannot be coordinated to obtain a plural adjectival phrase, since number features in adjectives are not interpretable:

(7)  a. *Los dos discos caro y barato que compraste ayer.
    ‘The two expensive and cheap records that you bought yesterday’
   b. *Las novelas aburrida y divertida que he leído estas vacaciones.
    ‘The boring and amusing novels that I read in the last vacation’
   c. *No me deje usted larga y corta las mangas de esta camisa.
    ‘Don’t you leave the sleeves of this shirt long and short on me’

All these are straightforward predictions of (2). Let us take a look at the problems now. An important problem for (2) comes also from adjectives, specifically from so-called descriptive, non-predicational, relational, classifying or ethnical adjectives. These adjectives have been analyzed by Levi (1974, 1978), Cinque (1994), Bosque (1993), Bosque & Picallo (1996), Demonte (1999) and others. An interesting property of these adjectives, not pointed out in any of these analyses, is the fact that they do not behave as the adjectives in (7) as regards coordination; that is, two or more singular relational adjectives can be coordinated and give rise to a plural expression enabled to agree with a noun. This is shown in (8):

(8)  a. Las literaturas española, francesa e inglesa
    ‘Spanish, French and English literatures’
   b. Los embajadores mexicano y argentino
    ‘The Mexican and the Argentinian ambassadors’
   c. Las políticas agraria y pesquera
    ‘The agricultural and fishing policies’
   d. Las ceremonias civil y religiosa
    ‘The civil and religious ceremonies’
   e. Mis abuelas paterna y materna
    ‘My grandmothers on my father’s and my mother’s sides’

In this paper I will present an analysis of (8) that is compatible with (2), and ultimately with (1). I will also extend the relevant syntactic configurations that permit (8) to genitive PPs and other modifiers.
3. A solution

I will use the label relational adjectives (somehow reminiscent of the French term *adjectifs de relation*) to refer to the adjectives in (8). Notice that the relevant issue is not only the fact that it is possible to coordinate these adjectives to obtain a projection with plural features. It is even more important to realize that these adjectives provide the cardinality value of these plural expressions: (8a) is about three types of literatures; (8b) refers to two ambassadors, (8d) implies that exactly two ceremonies are involved, etc. This is a surprising fact, since adjectives are not determiners or pronouns. It certainly looks strange to say that adjectives provide the referential information necessary to identify the number of entities of a set, but this is exactly what we find in (8). Before we deal with the syntactic structure of the DPs in (8), we may, then, reach a first conclusion on semantic grounds. The conclusion will not exactly be “Number features of relational adjectives are interpretable”, but rather (9):

(9) Relational adjectives in coordinate structures may determine the cardinal interpretation of plural DPs.

In this section and in the following, I will explain why these two apparently similar generalizations are not equivalent. Let me first ask this natural question: Why does this phenomenon arise with relational adjectives and not with other predicates? The truth is that it does arise with other predicates, as I will explain in a minute, but it is interesting to recall now that relational adjectives are denominal, even if they involve suppletive forms, as in the English adjectives *fraternal*, *French* or *agrarian*. All relational adjectives are, then, lexically derived from nouns. It has been repeatedly pointed out that affixes of relational adjectives come close to genitive case markers, as the Spanish preposition *de*, or to simple adjacency, as in English N-N compounds. These relations were pointed out in Levi (1974, 1978), Williams (1981), Ronat (1975) and many other studies. There seems to be a wide general agreement on the idea that suffixes of qualifying adjectives provide the semantic content necessary to introduce a predicative relation: “which has”, “containing”, “similar to”, etc. On the contrary, suffixes of relational adjectives are close to syntactic markers and provide the abstract content that Williams 1981 calls “R”. In fact, the problem for (2) that (8) raises extends to *de* complements naturally. The crucial contrasts are these:

(10) a. Los amigos de Juan y María
    ‘The friends of J. and M.’
b. Los amigos de Juan y los de María  
‘The friends of J. and those of M.’

c. Los amigos de Juan y de María  
Lit.: The friends of J. and of M.

The DP (10a) refers to a set of people who are friends of both Juan and Maria, who may or may not be a couple. (10b) refers to two separate sets, since the conjunction y is coordinating to independent DPs. The most interesting example of the three is (10c), which is ambiguous. (10c) only contains one determiner, but it has the meaning of either (10a) or (10b), an unexpected fact that we have to account for. A very similar contrast is found in (11):

(11)  a. Los embajadores de México y de Argentina  

   b. Los embajadores mexicanos y argentinos

The DP in (11a) is ambiguous in the sense that (10c) is. (11b) is also ambiguous in the same sense, but—as in (11a)—the interpretation in which one country has several ambassadors in another one is strange for pragmatics reasons (cf. negotiator, messenger, etc.). In the other reading, (11b) refers to the set of people who are or have been ambassadors of one of these countries or both. Remember that (8b) is not ambiguous: it refers to two different ambassadors, one from each country.

We have seen that the cardinality of the sets referred to in (8) is obtained from the coordinated adjectives. An interesting property of these structures is the fact that this reference cannot be provided by a numeral. Consider (12):

(12)  a. Los dos embajadores mexicano y argentino  
   ‘The two Mexican and Argentinian ambassadors’

   b. Los dos amigos de Juan y María  
   ‘The two friends of John and Mary’

The DP in (12a) is ungrammatical, and (12b) is not ambiguous: it has the interpretation of (10a), not that of (10b). We may intuitively say that the information provided by a numeral quantifier is redundant if the cardinality of a set is obtained through the syntax, somehow as in *The two John and Mary versus The two youngsters.

I will argue that all these properties may be derived from the syntactic structure. We need two syntactic configurations for these coordinate phrases. I will suggest that the projections which contain relational adjectives and de complements provide interpretable number features and help to identify
individuals. This is possible in a syntactic structure in which those adjectives and *de* complements are part of the subject of a predicational structure. These adjectives and modifiers can also be predicates of nominals in another, more familiar, structure, just as qualifying adjectives are. In this other structure, in which adjectives are simple predicates, they are not able to identify individuals and the issue of number feature interpretation does not arise. These two structures will explain the cases of ambiguity reported above.

Let us first assume, following Brucart & Gràcia (1986), Contreras (1989), Torregó (1988), Kester & Sleeman (2002) and others, that DPs such as (13) contain a nominal category \(\text{pro}\) whose grammatical features are provided by the determiner:

(13) El embajador de México y el *pro* de Argentina
    ‘The ambassador of Mexico and that of Argentina’

Kayne (1994) argues that *de* in *La voiture de Jean* is a prepositional complementizer which heads a functional projection whose complement is a predicational structure. Let us suppose that a similar abstract C/P projection is able to host the grammatical content of both Sp. *de* and relational affixes, also heads, so that *de México* and *mexicano* are able to match the features of this projection:

(14) \([\text{DP} \ [\text{D} \ \text{el} \ [\text{C/P} \ \text{pro} , [\text{C/P} \ {\text{de México} / \text{mexicano}}]]]]\)

This is a very natural move in Distributed Morphology (Halle & Marantz 1993 and subsequent work), since in this theory word formation processes take place at different levels of the grammar. Crucially, terminal elements in the syntax lack phonological features in Distributed Morphology representations. They relate bundles of morphological and syntactic features to bundles of phonological features, which are spelled out as a late process. This means that if *mexicano* is inserted in the C/P projection, it will match its features, just as the syntactic construction *de México* would. Let us try to represent the syntactic structure of (8b), repeated here as (15):

(15) Los embajadores mexicano y argentino

We want to account for the fact that these adjectives denote individuals, rather than properties, and also for the fact that they provide the cardinal interpretation of the DP, as argued above. The relevant structure will have
mexicano and argentino as part of the subject of a small clause. We may obtain this result in a structure such as (16):

Let me make some comments on this syntactic structure. As in Kayne (1994) a head-modifier structure is reduced to a subject-predicate small clause (PredP in (16)). The noun embajadores is its predicate and raises to Spec/PredP. Being a predicate, embajadores does not have interpretable f-features. In fact, it inherits them from the subject of PredP: &P. This coordinated structure contains two DPs will null heads. The D° head agrees with pro in each member of the coordination. The number features of pro are interpretable, since pro is an argument. &P has, then, plural features, since two “interpretable singulars” (those of the two pro) are being summed up according to (2). The article los ultimately agrees with embajadores, but the cardinality value of the whole DP is provided by the DPs conjoined in &P.

Recall that phonological insertion of features in terminal nodes is a late process. The C/P projection in (16) contains abstract (arguably Case) grammatical features. This projection is a predicate of pro. As we have seen, pro is a subject nominal with interpretable number features. If pro is
singular, the adjective *mexicano* can be inserted in C/P, since it is able to match \( \text{pro}_{\text{sing}} \). The number feature of *pro* is transmitted to D as in any DP structure. The &P is then plural, according to (2). The analysis is identical if instead of *mexicano*, we insert *de México* in the C/P phrase.

Let us now suppose that *pro* is plural in (16). In this case, &P automatically receives plural features, according to (4). If we have \( \text{pro}_{\text{plu}} \), we will not be able to insert *mexicano* in the first member of &P, since this adjective is marked with a singular feature. We will be able to insert *mexicanos*, as we may insert *argentinos* in the other member of the coordinate structure. If we do this, we get (11b) in one of their interpretations, namely the one in which two groups are coordinated. There is some controversy on whether or not the coordination of groups should be interpreted in a distributive manner (see Link (1998) for a review of analyses) but this does not concern us here. The point is simply that the &P would provide the interpretable number features of a plural subject.

Suppose now that we have \( \text{pro}_{\text{plu}} \) and we insert *de México* and *de Argentina* in the respective C/P projections of (16). These PPs have no number features, but *pro* has them. Consequently, &P, the predicate *embajadores* and *los* (in that order) will ultimately acquire these features. We obtain one of the interpretations of (11a) in this way, and we also get—from an identical syntactic structure—the reading of (10c) in which it is equivalent to (10a).

Regardless of whether *pro* is singular or plural in (16), we may think that the Ds of &P can be null in this structure because *los* has strong f-features. This suggests that the examples in (8) may be found in other Romance Languages with strong Ds. We also know that *embajadores* is licensed by the &P in (16), not by *los*, since *embajadores* cannot be null in DPs with nominal ellipsis. This is shown in (17):

\[
\begin{align*}
(17) & \quad \text{a. Los } \text{pro} \text{ mexicanos} & (\text{pro} = \text{embajadores}) \\
& \quad \text{‘The Mexican ones’} \\
& \quad \text{b. *Los } \text{pro} \text{ mexicano y argentino} & (\text{pro} = \text{embajadores}) \\
& \quad \text{‘The Mexican and the Argentinian ambassadors’}
\end{align*}
\]

Let us now turn to the second syntactic structure. If the adjectival coordinate projection is the predicate of PredP, things work as expected in an easier way. Various syntactic analyses will give the desired result for these coordinate structures, as long as they coincide in the fact that &P is not a subject in them. We may choose a structure such as (18a), in which *embajadores* raises to Spec/PredP from the subject of the small clause:
(18a) Los [PREDP [embajadores,] [PRED [PRED' ti [&P [C/P de México] [& y [C/P de Argentina]]]]]]
(18b) Los [PREDP [embajadores,] [PRED [PRED' ti [&P [C/P de México] [& y [C/P de Argentina]]]]]

or a structure in which the raising of the subject *embajadores* is obtained in an across-the-board configuration, as in (18b).

Whatever our choice is, the crucial point is that the DPs in (8) do not fit in these structures. Let’s see why. The coordinate projections in (8) could not get plural features in (18) because (2) disallows this possibility. Since the coordinate adjectives are predicates, two or more singulars cannot be summed up to obtain a plural, as in (7). If the head &° receives singular features through Spec/head agreement, as in (4), a conflict would arise with the plural in *embajadores*. The resulting structure will then crash because the subject (*embajadores* in this case) and the predicate cannot agree. We certainly could have a singular predicate, as in (19):

(19) El embajador mexicano y argentino
‘The Mexican and Argentinian ambassador’

This DP fits the requirements of (18), but not—crucially—those of (16), a desired result. Notice that no “hidden D-pro structure” is available for the &P of (19), since this expression refers to a single individual.

Suppose now that we have *mexicanos y argentinos* in the configurations of (18). In this case, we get a grammatical structure. We obtain the interpretation in which we denote a set of individuals with some properties, that is, we refer to the set of persons who are or have been ambassadors of these countries. The coordinate conjunction receives abstract plural features according to (4), which are not interpretable, according to (2). Another desired result is the fact that the relational vs. qualifying distinction somehow disappears if all these adjectives appear in a predicational structure.

4. Some extensions

Let us take a brief look at some possible extensions of this analysis. The first extension concerns possessives. We have seen that the C/P projection can be thought of as a Case projection. Postnominal possessive adjectives contain genitive features, as has traditionally been argued. It is not surprising, then, that they are able to fit the structure in (16):
(20) Los libros tuyo y mío
   ‘The books of you and mine’

As expected, (20) refers to exactly two books. The fact that prenominal possessives reject coordination (*Mi y tu libros ‘My and your books’) was attributed to their morphological status as clitics in Bosque (1987). Notice that (2) is not involved in these structures when these possessives have plural features, but the result is equally ungrammatical (*Mis y tus libros ‘My and your books’).

The second natural extension of the phenomena in (8) affects ordinals, as shown in (21):

(21) Las filas segunda y tercera
   ‘The second and third rows’

Morphology of ordinal numerals is relatively similar to that of relational adjectives, in that suppletion processes affect both. Again, the number features of segunda and tercera have to interpreted in (21). It is interesting to point out that these are the classical cases in which appositive structures come close to those formed with nouns and adjectives. In fact, ordinal numerals freely alternate with cardinal numbers in them (Las filas dos y tres ‘rows two and three’). Nominal appositions of the sort discussed by Jackendoff (1984), as in Las letras A, B y C (‘The letters A, B and C’) are also candidates for the same structure.

Let me remark that relational adjectives fit in the structure (16) because they are classifying adjectives and, in that sense, they help us to identify individuals. It has been pointed out by several authors that many evaluative adjectives are somehow strange in DPs with null heads in Spanish (as in ?El libro malo y el maravilloso ‘The bad book and the beautiful one’). This is correct, but we certainly cannot say that qualifying adjectives reject the construction with null nominal heads. From this perspective, there is problem in the fact that adjectives that allow for the nominal ellipsis in DPs do not exactly coincide with those allowing for the structure in (16):

(22) a. La muchacha mentirosa y la sincera
    ‘The lying girl and the sincere one’
    b. *Las muchachas mentirosa y sincera
    ‘The lying and the sincere girls’

This is a lexical problem, rather than a syntactic one. I take it to be a manifestation of the fact that the class or relational adjectives—that is, those
which license the C/P projection in (16)—is a grammatical class, not a pragmatic one, even if some of their members behave sometimes as qualifying adjectives, as has traditionally been pointed out. Consider colour adjectives, for example (in Demonte (1999); sections 3.4.2.2 and 3.5.1.2b, the reader will find a review of their grammatical characteristics in Spanish). It is obvious that colour adjectives provide properties, but it is also true that they are appropriate to classify individuals, and—consequently—they help us to identify them. The latter characteristic allows these adjectives to share the syntactic structure that we have suggested for the adjectives in (8), as (23a) witnesses. The former explains that this very structure is not available when colour adjectives are grouped with other qualifying modifiers, as in (23b):

(23)  
a. Las ballenas azul y blanca  
‘The blue and the white whales’

b. *Mis camisas azul y blanca  
‘My blue and my white shirts’

Other adjectives are well-known for their capacity to behave as relational in some contexts and as qualifying in others. A classical example is popular (‘popular’), which approximately means ‘known, widespread’ as a qualifying adjective, but comes close to ‘learned’ when it names a form of culture, as a relational adjective. Thus, if I have read two books, one very popular and the other one ignored or unknown, I cannot say (24a); but I can perfectly say (24b) if I want to refer to two different types of literature:

(24)  
a. *Los libros popular y desconocido que he leído  
‘The popular and the unknown books that I have read’

b. Las literaturas popular y culta del siglo XIX  
‘The popular and the learned literatures of the XIX century’

Other similar contrasts could easily be constructed. We may give a formal translation to these differences, in the sense that relational (but not qualifying) adjectives are able to match the C/P head suggested above. As we pointed out, the relational-qualifying distinction is partially lost if the coordinated phrases are predicates, that is, in structures such as (18).

5. Conclusion

Some adjectives help us to identify individuals and provide the cardinality value of plural DPs. Apparently, they have interpretable number features, but a close look shows that they lack them. The structure (16) is somehow paradoxical because it seems to present adjectives as subjects. It is not really
so, since the two members of &P are DPs, not APs. This structure allows us to maintain (2), and—crucially—also (1), in spite of the counterexamples introduced in (8). As we have seen, the interpretable number features in (16) are not those of the relational adjectives, but—ultimately—those of pro. Since pro is the subject of the C/P complement of D°, &P denotes as many individuals as DPs are coordinated, which gives us (9). Neither D nor pro are visible, but they are right there to give us the form and the interpretation of these syntactic structures.

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References


