Resolving Resolution:

Underspecification and the Law of Coordination of Likes[*]

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Abstract

In this article, feature computation in coordination is argued to derive from the interaction of three independent assumptions. First of all, feature computation is subject to the Law of Coordination of Likes (LCL). This constraint requires that the label of the coordination reflects all and only those properties of the conjuncts that are not mutually exclusive. Secondly, the proper representation of person, number and gender features requires a system of underspecification which interacts crucially with the LCL. Thirdly, it is assumed that the grammar contains a mechanism of 'default' agreement. The interaction of these three assumptions derives the feature computation of person, gender and number features in English, Dutch, and French, and of classifier features in Luganda and Bemba.

Keywords: coordination, conjunct, intersection, union, agreement, LCL, underspecification, default, feature computation, resolution, percolation, person, number, gender, classifier.

1. The problem

Agreement with coordinated DPs is a much debated issue in the literature on coordination (cf. among others Corbett 2006, Johannessen 1998, Dalrymple & Kaplan 1997, Munn 1993). Three agreement patterns can be distinguished. Agreement can target the first conjunct of the coordination (First Conjunct Agreement, FCA), the last conjunct of the coordination (Second Conjunct Agreement, LCA), or a combination of features of both conjuncts of the coordination (Full Agreement, FA). FCA is illustrated in (1) for Standard Arabic (see e.g. Johannessen 1998, Aoun, Benmamoun & Sportiche 1994, and Van Koppen 2005).

(1)   a. **xaraj-at   al-bintu**   wa   ʔal-waladu

         left-$_{3SG.F}$ [the girl   and   the boy]

         'The girl and the boy left.'

      b. **xaraj-a   ʔal-waladu**   wa   al-bintu

         left-$_{3SG.M}$ [the boy   and   the girl]

         'The boy and the girl left.'

                              [from Harbert & Bahloul 2002:50-51, Standard Arabic]

In FCA (1), the finite verb agrees with the gender and number feature of the first conjunct. This is immediately clear when the difference between the a- and the b-example is taken into account. The order of the conjuncts is of crucial importance for the feature specification on the finite verb. When the first conjunct is feminine, as in (1a), the finite verb is also specified for feminine, but when the first conjunct is masculine, as in (1b), the finite verb is specified for masculine.

LCA, agreement with the last conjunct of the coordination, is discussed by among others Bošković (2008), Marušič et al. (2007) and Johannessen (1998), and illustrated in (2) for Serbo-Croatian:

(2)   a. Sva   sela   i   **sve varošice**   su juče   **uništene.**

       all   villages-$_{NEUT}$ and all   towns-$_{FEM}$ are yesterday destroyed.$_{FEM}$

       'All villages and all towns were destroyed yesterday.'

    b. Sve   varošice   i   **sva sela**   su   juče   **uništena.**

       all   towns-$_{FEM}$ and all   villages-$_{NEUT}$ are yesterday destroyed.$_{NEUT}$

       'All villages and all towns were destroyed yesterday.'

                         [from Bošković 2008:2, Serbo-Croatian]

In (2), the participle agrees with the gender feature of the last conjunct. The difference between the a- and the b-example makes this clear. In the a-example, the last conjunct is feminine and the gender specification on the participle is also feminine. However, when the order of the conjuncts is switched, and the last conjunct is neuter, the gender marking on the participle is also neuter.

The examples in (1) and (2) are both cases of partial agreement: only one conjunct is targeted for agreement. Now consider the example in (3). This example is different from the former ones in two important respects. First of all, unlike in FCA and LCA, the order of conjuncts has no influence on the resulting agreement, as shown in the respective orders of (3a) and (3b).

(3)   a. Lui   et   moi   partons

         Him and   me   leave$_{\text{IND.1P.PL}}$

      b. Moi   et   lui   partons

         Me   and   him   leave$_{\text{IND.1P.PL}}$

         'He and I leave.'

                                                                              [French]

Secondly, unlike in FCA and LCA, agreement on the verb does not reflect the features of just one of the conjuncts. Rather, the agreement on the verb seems to target a combination of both conjuncts: 3P.SG *lui* 'him and 1P.SG *moi* 'me' trigger 1P.PL agreement on the finite verb. More specifically, the number specification of the reflexive pronoun is plural, whereas both conjuncts are singular. This means that at least number agreement does not target one of the conjuncts, but seems to be calculating that a coordination with two singular conjuncts is plural.[1] Furthermore, person agreement on the verb is determined by the 1P pronoun rather than by the 3P pronoun (see below), irrespective of their order.

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[1] We will come back to this statement and refine it below.

This type of agreement is called Full Agreement (FA), because both conjuncts are involved in determining agreement (cf. a.o. Dalrymple & Kaplan 1997).[2] By contrast, partial agreement, including both FCA and LCA, is sensitive to (i) the order of conjuncts, as shown above, and (ii) the ordering between agreement target and agreement controller. This last point is demonstrated by Van Koppen (2005) who shows that agreement with the first conjunct is only possible if the target precedes the controller, and Bošković 2008 who shows that last conjunct agreement is restricted to contexts in which the controller precedes the target.

It is clear that the agreement pattern in (3) significantly differs from the ones illustrated in (1) and (2). In this paper we will not discuss partial agreement, but we restrict ourselves to the pattern exemplified in (3), which we will dub the percolation pattern.

In the percolation pattern, the features of the coordination are, as we already discussed above, partly determined by the features of the conjuncts. Consider the data paradigm in (4) from French. In (4b-c), 1P.PL agreement on the verb is determined by the 1P feature of the second conjunct. This agreement is identical to that triggered by the 1P.PL pronoun in (4a). In (4d), 2P.PL agreement is determined by the first conjunct's 2P feature.

(4)a. Nous partons/ *partez/ *partent

    We   leave.IND.1P.PL/ 2P.PL/ 3P.PL

    'We are leaving'

  b. Jean et   moi partons/ *partez / *partent

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[2] The term FA is somewhat misleading: only specific features from each conjunct contribute to the resulting agreement.

Jean   and   me   leave.IND.1P.PL/ 2P.PL/ 3P.PL

'Jean and I are leaving'

c. Toi   et   moi   partons/ *partez / *partent

You   and   me   leave.IND.1P.PL/ 2P.PL/ 3P.PL

'You and me are leaving'

d. Toi   et   lui   *partons/ partez / *partent

You   and   him   leave.IND.1P.PL/ 2P.PL/ 3P.PL

'You and him are leaving'

[French]

A person hierarchy 1P > 2P > 3P applies in determining the person features of the coordination on the basis of the features of the conjuncts (Zwicky 1977:718). The relevant person features of the conjuncts are usually assumed to 'percolate up' to the level of the coordination to form part of its feature set. An informal definition of percolation is as follows:

(5)   *Feature percolation in coordination*

The person, number and gender features of the syntactic terminals in the conjuncts of a coordination combine at the level of the maximal projection of the coordination to be available for further morphosyntactic operations.

There are various ways of implementing this informal notion of percolation. Corbett (1983) proposes declarative resolution rules, or 'patterns of feature computation' (Corbett 2006). Intuitively, the most appealing way to implement these patterns of feature computation is by making use of an operation that unifies features. More

specifically, the feature sets of the conjuncts are unified, resulting in the feature set of the coordination as a whole. This type of analysis has for instance been put forth in Dalrymple & Kaplan (1997). They argue that percolation should be viewed as union of features (rather than as intersection of features as in Sag *et al.* (1985)). Dalrymple & Kaplan (1997) derive the person hierarchy by a progressively more specified representation of feature values for the category person. 1P equals the feature set {S, H} (with S, H meaning speaker and hearer respectively). 2P equals just {H}, and 3P is represented as the underspecified { }, in accordance with Benveniste's (1967) insight that 3P is non-person. Union of features of the less specified 3P and 2P conjuncts with the most specified 1P conjunct will yield the desired 1P features on the coordination in (4bc). Union of features of the most specified 1P with those of the less specified 2P will yield the {S, H} features of 1P. A critical remark is in order, though. While the specification of 1P as {S, H} is certainly correct for (inclusive) 1P.PL, the use of the feature set {S, H} for 1P.SG seems more analytically convenient than theoretically justified.

However, the notion of percolation of features as union of the features of the conjuncts on the coordination runs into more serious problems when it comes to gender and number features. Consider gender (see also Corbett 2006:Ch 8).

In French, coordination of feminine nouns predictably determines feminine agreement on the predicate as in (6a). However, coordination of masculine and feminine nouns determines masculine agreement, as in (6b):

(6)   a. Josephine   et   Marie   sont   intelligent*(e)s

         Josephine   and   Marie   are.PL   intelligent$_{\text{(FEM).PL}}$

         'Josephine and Marie are intelligent'

b. Jean   et   Marie   sont   intelligent(*e)s

Jean   and Marie   are.PL intelligent.(FEM).PL

'Jean and Marie are intelligent'

[French]

Now it is well known that there is an asymmetry between masculine and feminine in French in the sense that masculine is the unmarked or 'default' value, while feminine is marked. This marked/unmarked difference can be observed in the use of the masculine 3P pronoun for expletives (*Il pleut* vs. **elle pleut* 'It/he rains vs. it/she rains'), as well as in the use of masculine gender for (most) loanwords (*le parking* 'the parking space', *le golf* 'golfing', etc) and exocentric compounds (*le lave-vaisselle* 'the dishwasher', *le pare-brise* 'the windscreen'). In terms of the underspecification system assumed by Dalrymple & Kaplan, masculine can be said to represent unspecified gender, while feminine corresponds to specified gender. Assuming Rooryck's (2001) adaptation of Scobbie's (1997) Attribute - Value system, masculine can be represented as {Gender : ___ }, while feminine is {Gender : fem }.

Consider now gender percolation in terms of union of the features of the conjuncts. Union of unspecified (masculine) gender with specified (feminine) gender should cause only the specified values to percolate to the coordination. In the same way as for the unspecified 3P features, unspecified gender values of a conjunct are not expected to determine the features of the coordination. This prediction is contrary to fact: the coordination of masculine and feminine conjuncts displays unspecified, i.e. masculine, gender, not the specified feminine. In other words, the coordination displays 'default' masculine agreement when the conjuncts are of different genders.

Therefore, a stipulation is needed which blocks union of gender features at the level of the coordination.

A similar problem with percolation in terms of feature union arises with number. In (4bc) above, neither of the conjuncts expresses PL. Nevertheless, the coordination determines PL agreement. Corbett (1983:176) accounts for this in terms of resolution rules. In addition to the two rules he proposes for person resolution of the type described above for French, these rules state that the coordination of two SG conjuncts (in principle) yields PL on the coordination.

Under any account, the PL feature of the coordination cannot simply result from 'adding up' the features of individual conjuncts: two SG conjuncts cannot yield PL unless by stipulation, i.e. a declarative rule of resolution or feature computation. Within a Minimalist framework, and perhaps in others as well, the theoretical problem is this: although the syntactic component is responsible for creating coordinate structures via Merge, that same syntactic component cannot create PL from SG conjuncts. In Minimalist terms, the problem is that PL is not part of any element of the Numeration. Adding PL in the course of the syntactic derivation would violate the Inclusiveness Condition (*No new features are to be introduced by the computational system of language*). As a result, syntactic coordination is unable to feed morphology with the requisite PL feature.

There are other indications that the syntactic component cannot be responsible for the PL feature on the coordination of SG conjuncts. Coordination of SG mass nouns can determine SG agreement, as shown in (7) (see also Cremers 2001).[3]

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[3] Grev Corbett (p.c.) informs us that cases such as (7) are not calculated by resolution rules, since resolution only applies when agreement is with all the conjuncts and feature computation is required. For Corbett, the cases in (7) allow 'straight' semantic agreement in which the fact of having conjoined NPs is not necessarily relevant: they are comparable to (i).

(7)   a. Free coffee and tea is/ are served in the lobby.

      b. Today's sugar and flour is/ are more refined.

      c. Today's New York Times and Wall Street Journal *is/ are

         available in the lobby.

If the syntactic component were responsible for calculating the number feature of the coordination, it would most likely be blind to the semantic contents of the conjuncts, and trigger PL agreement in all cases. Such cases also show that the conjunction *and*

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i.   Five pounds/euros is too much.
ii. Drugs is/ are a problem

In our view, however, the cases in (7) are not comparable to (i-ii). In (7), both singular and plural agreement are available, while in (i) singular agreement is strongly preferred, as shown in (iii-iv):

iii. Five euros is/*are too much.
iv. Six feet is/*are tall for a boy his age

Note that the cases in (iii-iv) with singular agreement are restricted to plural DPs expressing measures. Regarding the example in (ii), we observe that it is not generalizable:

iv. Peanuts lie/*lies on the table.
v.   Scissors are/ *is dangerous

Corbett (p.c.) proposes that the sentences in (4) are comparable to (vi-vii):

vi. Strawberries and cream tastes good
vii. Fish and chips is so English

We do not think that this comparison is warranted. The cases in (vi-vii) are clear collocations of the *macaroni and cheese* variety. Their order is fixed in the intended sense, and when the conjuncts are modified, the sense of the collocation is lost:

viii.   ?? Chips and fish is so English. / ?? Cheese and macaroni is not very tasty.
ix.   Fried fish and soggy potato chips are/ *is so English.

Note that the sentences in (4) cannot be analyzed as collocations:

x.   Freshly brewed coffee and delicious tea is served in the lobby.
xi.   Freshly brewed tea and delicious coffee is served in the lobby.

In addition, the singular/ plural alternation in (4) has interesting interpretive consequences. Only plural agreement in (7) is compatible with a distributive reading:

v.   Free coffee and tea are/ *is successively served in the lobby at 10.00 AM and at 4.00 PM.

cannot be held responsible for the PL feature of the coordination either: if *and* was inherently PL, singular agreement would never be an option.

Summing up, person, number and gender features of the conjuncts do not seem to obey the union operation performed by coordination in the same way. While the mechanism of union of features elegantly accounts for the eventual person feature properties of the coordination, that same operation does not yield the right results when it comes to number and gender features. The syntactic component cannot be responsible for calculating the feature composition of the coordination on the basis of the features of the conjuncts. The person features of the conjuncts compositionally determine the person features of the coordination, while the gender and number features of the conjuncts do not. The question remains what mechanism, short of listing declarative resolution rules, is responsible for the feature composition of the coordination.

2. Proposal: Feature computation and the Law of Coordination of Likes

We would like to propose that the computation of the features of coordination out of the features of the conjuncts is reducible to the semantic operation carried out by coordination. Coordination conjoins elements of the same sort, an observation laid down in Williams' (1978) Law of Coordination of Likes (LCL). Similarity is not restricted to syntactic features, but has been shown to extend to semantic function or functional equivalence (Dik 1968, Sag et al 1985, Munn 1993, Peterson 2004, Haspelmath 2005). We assume, following Munn (1993), Johannessen (1998), Progovac (1998), that coordinated DPs are syntactically projected in a CoP structure.

The semantic function of the coordinating element is to create a set of like items, in accordance with the LCL. We take this to mean that coordination carries out two at first sight contradictory operations at the same time. Coordination involves union

since it forms a larger set out of the smaller sets constituted by the conjuncts. Coordination also performs intersection, since it requires, by the LCL, that the set of items created by coordination receives a common semantic label. The minimal constraint imposed by the LCL, we assume, is that the label of the coordination reflects all and only those properties of the conjoined smaller sets that do not mutually exclude each other. In other words, the LCL ensures that the set unified by coordination is defined by the intersection of the not mutually exclusive properties of the conjuncts. The feature composition of CoP reflects this intersection. Coordination syntactically and semantically performs union of the conjuncts, but the label CoP bears, is constrained by the LCL to all not mutually exclusive properties of its conjuncts.

If the set created by coordination is a set of individuated items, the features of CoP should reflect all not mutually exclusive properties of these individuated items. This explains the difference between French (3a) and (3b). In (3a), both conjuncts are 3P and feminine, so the not mutually exclusive properties of the coordination include both 3P and feminine. In (3b), where there is a gender mismatch between the conjuncts, the not mutually exclusive features of the coordination are restricted to 3P.

How does PL arise in these cases from 3P, but nevertheless SG, conjuncts? We assume that SG simply is the absence of number. Moreover, PL number is never really represented as such on the coordination: we propose that the semantic labeling of CoP as a set of sets is interpreted by the morphology as an instruction for PL number agreement.

The constraint that properties be not mutually exclusive not only applies between two different values of the same feature, as with masculine versus feminine, but it is also relevant between features. Take (7ab), where the set created by coordination consists

of non-individuated items. As we have illustrated, the features of CoP can be either singular or plural. If CoP is plural, it reflects the semantic label of the coordination as a set of distinct subsets: the subset property is a shared and not mutually exclusive property of the conjuncts. The semantic labeling of CoP as a set of sets is interpreted by the morphological component as an instruction for PL number agreement. If CoP is singular, it reflects the non-individuated feature of both conjuncts, another shared and not mutually exclusive property of the conjuncts. The question now arises why both nonexclusive properties of the conjuncts, the non-individuated feature of the conjuncts and the set property, are not represented on CoP. The reason is that both properties are mutually exclusive: the coordination cannot at the same time reflect set (count) properties and non-individuated (mass) properties.

Let us now turn to the most recalcitrant cases, the resolution of person features as in (4bcd). In a case such as (4c), there seem to be no features that are not mutually exclusive and shared by both conjuncts: 1P and 2P are mutually exclusive as masculine and feminine. The same reasoning applies to (4bd). At first sight, therefore, (4bcd) violate the LCL, since no features of the conjuncts that are not mutually exclusive can be identified to define the coordination. In other words, the problem of the difference between person features and gender features when it comes to computing the features of the coordination out of those of the conjuncts, has come back with a vengeance.

We would like to propose, however, that the solution to this conundrum lies in a radically different semantic representation for person and gender. In their discussion of the feature person, Baker & Bobaljik (2002) adopt what they call the inclusion hypothesis. This hypothesis states that the feature 1P refers to a group that *includes* the speaker, rather than that 1P *denotes* the speaker. The difference between *including*

the speaker vs *denoting* the speaker becomes clearer once the structure of inclusive 1P.PL pronouns is taken into account. An inclusive 1P.PL pronoun does not refer to some *entity* that denotes at the same time the speaker and the hearer, but it rather refers to a *group* that includes both the speaker and the hearer (Baker & Bobaljik 2002:5). If the formalization of the category person is to be coherent, its representation should be identical for singular and plural pronouns. As a result, the pronoun *I* should be assumed to formally refer to a group with one member that includes the speaker, and 2P.SG pronouns should be viewed as referring to a group with a single member referring to the hearer.

Gender, by contrast, cannot be formalized in the same way. The feature feminine does not refer to a group that includes a single feminine entity. Rather, it refers to a property shared by members of a group in which all entities are feminine.

Once the category person is conceived of semantically as a group, 1P and 2P cease to be mutually exclusive: their shared and not mutually exclusive property consists in the fact that they refer to (singleton) sets. Therefore, these person properties will define the coordination as a whole.

Finally, we have to address the question how the set {{1P}, {2P}} in (1c), and {{1P}, {3P}} in (1d) trigger 1P.PL agreement on the verb. For PL number, we have already provided the answer: the semantic labeling of CoP as a set of sets is interpreted by the morphology as an instruction for PL number. We should also point out that 1P.PL really is a misnomer: it never is the plural of 1P (*me and me*). The combination of 1P and 2P and 1P and 3P is well known from languages with inclusive and exclusive 1P.PL pronouns: 1P.PL is simply the combination of 1P with 2P or 3P (Cysouw 2003). We therefore propose that such combinations are universally spelled out as 1P.PL. Rooryck (2006) similarly shows that 1P.PL

pronouns such as French *nous* 'we' underlyingly can be assumed to have a structural representation involving a 1P pronoun and a 2P/3P pronoun. The same is true for the combination of {{2P}, {3P}} in (1d): such combinations are – abstracting away from homophony in the paradigm – spelled out as 2P.PL.

3. Some more intricate cases of feature computation

In this section, we discuss a number of more intricate cases of feature computation in coordination. First, the proposed analysis of feature computation is applied to a hitherto unobserved set of data concerning coordination and feature resolution in French and Dutch. In the final two sections, we discuss feature computation in Slovene and Luganda, two languages for which the feature resolution system is described by Corbett (2006). These languages are interesting for different reasons. First, in Luganda, a Bantu language, it is the noun classifier system rather than a person/number system which is subject to feature computation. Secondly, Slovene appears to not fully obey Corbett's resolution rules.

3.1   Pronominally used demonstratives in Dutch and French

The system of feature computation for coordination proposed above can also be applied to a few cases that have hitherto not been tackled in the context of feature resolution. Consider (8) and (9):[4]

(8)   a. Deze en die zijn/ *is te koop

      this.MASC/FEM and that.MASC/FEM is/ are for sale

      'This and that is for sale'

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[4] We would like to thank Gertjan Postma for pointing out the relevance of these Dutch data.

    b. Dit en dat is/ *zijn te koop

       this.NEU and that.NEU is/ are for sale

       'This and that is for sale'

    c. Dit huis en dat appartement zijn/ *is te koop

       this.NEU house and that.NEU apartment are for sale

       'This house and that apartment are for sale'

<div align="right">[Dutch]</div>

(9)   a. Celui-ci et celui-là sont/ *est à vendre

       this.one.MASC-here and that.one.MASC-there is/ are for sale

       'This one and that one are for sale'

    b. Ceci et cela est/ *sont à vendre

       this.MASC.here and that.MASC.there is/ are for sale

       'This and that is for sale'

    c. Ce livre-ci et ce disque-là sont/ *est à vendre

       this.MASC book-here and that.MASC disk-there are for sale

       'This book and that disk are for sale'

<div align="right">[French]</div>

In (8a), the pronominally used MASC/FEM demonstrative determiners *deze* 'this' and *die* 'that' conjuncts only trigger PL agreement. Surprisingly, in (8b), the pronominally used neuter demonstrative determiners *dit* 'this' and *dat* 'that' only trigger SG agreement. The latter agreement pattern is restricted to pronouns and does not constitute a general feature of neuter nouns, as (8c) shows. The crucial role of the

absence of properly (pro)nominal features is underscored by the French data. Both (9a) and (9b) involve MASC gender, but only (9ac), where either the pronoun *lui* 'him/her/it' or nouns are expressed, trigger PL agreement. In Dutch, neuter functions as the underspecified 'default' gender: the neuter determiner *het* appears as the expletive subject of weather verbs, and diminutive morphology imposes neuter gender (cf. also Rooryck 2003). The descriptive generalization over both the French and the Dutch cases therefore seems to be that conjuncts featuring pronominally used demonstrative determiners with underspecified or 'default' gender determine SG agreement on the coordination. The idea that conjoining of defaults gives a default has also been noted by Corbett (1991:212) and Corbett (2000:173).

This generalization can be derived as follows in terms of the analysis presented here. Following Jones (1996) for (10b), and slightly simplifying,[5] we assume that the internal structure of (8ab) and (9ab) are as in (10ab) respectively:

(10)   a.   [$_{DP}$ [$_D$ dit/ dat/ deze/ die]   [$_{NP}$ [$_N$ pro]]]   [Dutch]

       b.   [$_{DP}$ [$_D$ ce]   [$_{NP}$ [$_N$ lui/ pro]] [$_{PP}$ ci]]   [French]

We also assume the underspecification system proposed by Rooryck (2001:Ch7-8), who reduces the feature animacy to person. Inanimate (pro)nouns simply lack an Attribute - Value specification for the category person. Pronouns such as French *lui* 'him/ her/ it' or Dutch *die* 'this.MASC/FEM' / *deze* 'that.MASC/FEM' can refer to both animate and inanimate nouns. Therefore, they are only underspecified for person {Person : α}, making them compatible with both animate and inanimate

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[5] The simplification concerns the representation of *lui* 'him/her/it' as N. It is more accurately represented as a D, with a demonstrative functional layer hosting ce 'DEM'.

interpretations. As far as Gender is concerned, masculine in French and neuter in Dutch are unspecified {Gender : ___}, or may lack the category gender altogether.

When the pronominally used demonstrative Ds with masculine or neuter gender as in (8b) and (9b) are analyzed along these lines, they turn out to lack any specified person, number or gender features at all. Since they have an inanimate interpretation, they lack person specification. Being singular, they lack positive specification for number. In other words, there is nothing to specify the sets making up the coordination. As a result, the computation of the not mutually exclusive features of the conjuncts, necessary to define the morphosyntactic features of coordination, ends up with preciously little: only the demonstrative feature of the determiners defines the coordination as a whole, a feature that is insufficient to trigger plural agreement. As a result, the coordination will end up with a 'default' singular specification, and trigger singular agreement in the morphological component.

The careful reader will object that the lack of specification does not prevent the coordination from being made up out of a set of sets, which we have taken to be an instruction for the morphological component to trigger plural agreement. We therefore have to qualify the relationship between the LF feature computation of the coordination on the one hand and the morphological component on the other. We propose that the set of sets can only be recognized as such by the morphological component if the sets composing the coordination have at least one feature specification for person, number or gender.

In (8a) and (9a), by contrast, French *lui* 'him/ her/ it' and Dutch *die* 'this.MASC/FEM' / *deze* 'that.MASC/FEM' do have a feature specification for person, {Person : α }, which makes them compatible with both animate and inanimate interpretations. This type of underspecification is sufficient for the coordination to be

recognized as a set of sets by the morphological component, triggering plural agreement.

3.2   Coordination in Luganda: computation of class features

Like many Bantu languages, the feature system in Luganda manifests itself in the guise of class features rather than via person/number/gender features. As Corbett (2006:249) shows, quoting Givón (1970), Luganda class 1/2 (1 for singular, 2 for plural) contains human or animate nouns (although it is not the case that all human or animate nouns are class 1/2). The coordination of nouns from different noun classes necessitates resolution rules in order to determine class agreement on the verb. Corbett (2006:250) proposes the following resolution rules for Luganda (see also Marten 2000 for Swahili, Givón 1970):

- If all the conjuncts are semantically human, agreement is gender 1/2

- If none of the conjuncts is semantically human, agreement is gender 7/8

- If the conjuncts are semantically mixed, the commitative construction is preferable: if gender resolution is forced, the form will be as for non-humans.

Consider some examples of Luganda feature resolution in (11) (from Corbett 2006:249).

(11) a.   Omu-kazi,   es sajja   ne   olu-ana   ba-alabwa.

$_{SG}$-woman(1/2), $_{SG}$-fat.man(5/6)   and $_{SG}$-thin.child(11/10) 2-were seen

'The woman, the fat man and the thin child were seen.'

b.   en-te,   omu-su,   eki-be   n   eely-ato

SG-cow(9/10), SG-wild.cat(3/4), SG-jackal(7/8) and   SG-canoe(5/6)

bi-alabwa.

 8-were.seen

'The cow, the wild cat, the jackal and the canoe were seen.'

[Luganda]

In (11a), all conjuncts are semantically human and the verb shows class 2 agreement. By contrast, example (11b) shows that the coordination of non-human conjuncts triggers class 8 agreement on the verb.

The question arises how the system of feature computation developed in the previous section deals with feature computation in a language like Luganda. We would like to claim that the very same system is applicable here. In example (11a) the only not mutually exclusive feature is [human]. As a result, the finite verb shows class 2 agreement, the default class for expressing the property of humanness. The opposite holds for the example in (11b). In this example, the LCL determines that the property non-human is the only not mutually exclusive feature, and hence the default class for non-humans is used.

Our proposal makes an interesting prediction, namely that if two nouns of, for instance, class 5/6 are conjoined, the class feature 5/6 itself can also function as the not mutually exclusive feature represented on CoP, which should concomitantly be able to show up on the verb. Unfortunately, we do not have access to speakers of Luganda. However, this prediction is confirmed by the feature computation system in Bemba, another Bantu language with a class feature system.[6]

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[6] We would like to thank Nancy Kula (p.c.) for providing us with the information about Bemba.

In Bemba, just as in Luganda, class 1/2 consists of human nouns, and coordinated human nouns show class 2 agreement. The coordination of non-human nouns triggers class 8 agreement on the verb. Class 8 agreement functions in Bemba as the default class for non-humans. In Bemba, however, not all human nouns necessarily fall into class 1/2. Interestingly, the coordination of class 7 human nouns, which involve augmentatives, triggers class 8 agreement on the verb, as in (12a). Similarly, the coordination of human nouns that fall in class 12, which involve diminutives, is reflected as class 13 agreement on the verb, as in (12b). Class 2 agreement is marginally possible.

(12)   a. icimuntu   ne   cimwana   fi-ali-butuka   /   ?? ba-ali-butuka

   7-person   and   7-child   8-past-run   /   2-past-run

   'The person and the child ran'

   b. akamuntu   na   kamwana   tu-ali-butuka   /   ?? balibutuka

   12-person   and   12-child   13-past-run   /   2-past-run

   'The person and the child ran'

[Bemba]

In these examples, the class feature is not mutually exclusive. As a result, it ends up in the feature set of CoP. However, class 2 agreement is also not fully ungrammatical. The coordinated nouns in these examples all have the feature [human]. In Bemba, human augmentative and diminutive nouns are assigned class 7/8 and 12/13 respectively, rather than the class 2 that their [human] feature would suggest. However, it is likely that the feature [human] is grammatically available on these

nouns, and hence can play the role of the not mutually exclusive feature of both conjuncts that is represented on CoP by virtue of the LCL.

This becomes even more clear if a class 12 human noun and a nonhuman noun of the same class are coordinated. The resulting agreement on the finite verb can be either the grammatically available class 13, or the 'default' agreement of class 8. When class 13 agreement is manifested on the verb, the not mutually exclusive feature crucial for the LCL is the class 12 feature on the coordinated nouns. In case 'default' class 8 agreement shows up on the verb, the not mutually exclusive property of both conjuncts is the [non-human] feature. For all intents and purposes, this situation is exactly parallel to the analysis of the alternation between singular and plural agreement on the verb in (7) (*Coffee and tea is/are available*). In these cases, we argued that either the subset property plays the role of the not mutually exclusive feature of both conjuncts represented on CoP, resulting in plural agreement on the verb; or the non-individuated property does, triggering singular agreement.

3.3   Feature resolution in Slavic

Finally, we would like to examine feature resolution in Slavic. Corbett (2006:242-244), quoting Lenček (1972), provides the following Slovene examples:

(13) a. Marina,   Marta   in Marjanca   so   prizadevne.

Marina-FEM.SG,   Marta-FEM.SG and Marjanca-FEM.SG are   assiduous-FEM.PL

'Marina, Marta and Marjanca are assiduous.'

b. Tonček   in   to   dekletce   sta   prizadena.

Tonček-MASC.SG and that-NEUT.SG little.girl-NEUT.SG are   assiduous-MASC-DUAL

'Ton and that little girl are assiduous.'

c. Milka   in   njeno   tele   sta   bila   zunaj.

Milka-FEM.SG   and   her-NEUT.SG calf-NEUT.SG   aux   be MASC-DUAL   outside

Milka and her calf were outside.

[Slovene]

Feature computation in these examples can be derived from the analysis presented here, if we make the additional assumption that masculine is the default value for gender in Slovene. The idea that masculine is the default value is confirmed by the fact that most loan words in Slovene adopt masculine gender. Example (13a) shows that if all conjuncts are feminine, the feature set of the coordination also has the value feminine. This is similar to the computation of gender features in French, cf. supra example (6). In the examples (13bc), the conjuncts do not have the same value for gender. As a result, the not mutually exclusive feature set of both conjuncts does not contain gender features. According to the LCL, gender is therefore not part of the features of CoP, and the default value for gender is used, i.e. masculine. Under our assumptions, neuter + masculine yields default masculine in Slovene, just like feminine + masculine yields default masculine in French. A difference between Slovene and French is that in Slovene a set containing just two sets is taken by the morphology as an instruction to realize dual number agreement.

So far, feature computation in Slovene seems to follow from the LCL as expected. However, resolution of neuter features appears to be more problematic. Consider the example in (14) (from Lencek 1972, quoted in Corbett 2006:238 and Lanko Marušič p.c.).

(14) To   drevo   in   gnezdo   na   njem   mi

that   tree-_{NEUT.SG}   and   nest-_{NEUT.SG}   on   3SG.N.LOC   1SG.DAT

bosta   ostala   v   spominu.

AUX.FUT.3DU   remain_{MASC.DUAL}   in   memory-_{SG.LOC}

'That tree and the nest on it will remain in my memory.'

[Slovene]

In this example, the conjuncts are neuter singular, but the agreement on the finite verb is masculine, see Corbett (2006:238). Under the analysis assumed here, this is unexpected. Application of the LCL dictates that the not mutually exclusive feature of both conjuncts be [neuter]. As a result, gender agreement on the finite verb should also be [neuter] in (14), rather then the observed [masculine]. Corbett (2006:244) describes this pattern in terms of resolution rules by saying that in Slovene agreement with a coordination always leads to masculine agreement with one exception, namely if all conjuncts are feminine. In the latter case the agreement with the coordination is feminine. Furthermore Corbett shows that if all conjuncts are neuter plural in the Slavic languages, neuter gender marking does appear on the target for agreement. This is illustrated by the Slovene example in (15) (from Lanko Marušič p.c.).

(15)   Ta   drevesa   in   gnezda   na   njih,   mi

these trees--_{NEUT.PL} and nests--_{NEUT.SG} on   3PL.N.LOC 1SG.DAT

bodo   ostala   v   spominu.

AUX.FUT.3PL   remain-_{MASC.PL}   in memory-_{SG.LOC}

'These trees and the nests on it will remain in my memory.'

[Slovene]

This description of the gender agreement system in Slovene is not fully descriptively adequate, however. This becomes clear when we incorporate data reported by Bošković (2008) for Serbo-Croatian. This Slavic language has the same characteristics when it comes to feature resolution as Slovene, the only difference is that Serbo-Croatian has no dual number. However, Serbo-Croatian shares with Slovene the resolution properties described above. A combination of two masculine conjuncts leads to masculine agreement, a combination of two feminine conjuncts leads to feminine agreement, but the combination of two neuter conjuncts does not lead to neuter marking on the agreement target if the conjuncts are both singular, but it does when both are plural. This is illustrated in the examples in (16).

(16) a. Svi psi   i   svi   magarci   su   juče   prodani.
          all dogs.masc   and all   donkeys.masc are   yesterday   sold.masc
          'All dogs and all donkeys have been sold yesterday.'

      b. Sva   telad   i   sva   paščad   su   juče   prodana.
          all   calves.neut and all   dogs.neut   are   yesterday   sold.neut
          'All calves and all dogs have been sold yesterday.'

      c. * Jedno   tele   i   jedno   pašče   su   juče   prodana.
          one   calf.neut   and one   dogs.neut   are   yesterday   sold.neut

      d. Jedna   krava   i   sve   ovce   su   juče   prodane.
          one   cow.fem   and all   sheep.fem   are   yesterday   sold.fem
          'One cow and all sheep were sold yesterday.'

                                                      [Bošković 2008, Serbo-Croatian]

Bošković (2008) shows that the paradigm in (16) does not capture the whole pattern. He illustrates that neuter gender also ends up on the agreement target when the first conjunct is neuter singular and the second one neuter plural, but not the other way around, see (17).

(17) a. * Sva   telad   i   jedno   pašče   .

   all   calves-NEUT.PL and   one   dog- NEUT.SG

   su   juče   prodana

   are   yesterday   sold- NEUT.PL

   b. ? Jedno   tele   i   sva   paščad   .

   one   calf- NEUT.SG and   all   dogs- NEUT.PL

   su   juče   prodana

   are   yesterday   sold- NEUT.PL

   One calf and all dogs were sold yesterday.'

                                        [Bošković 2008, Serbo-Croatian]

The data in (17) show that the appearance of neuter gender on the agreement target is dependent on the order of conjuncts. Only if the neuter plural is the last conjunct, then the agreement target, i.e. the past participle, also shows neuter gender. This means that we are not dealing with a percolation pattern in this case, but with partial agreement, since the agreement on the target is sensitive to the order of conjuncts (see section 1 above).

The same is true for Slovene. Consider the examples in (18) below (from Lanko Marušič p.c.)

(18) a. * tri teleta in eno žrebe so bila zunaj.

   three calves and one foal aux been-NEUTER PL outside

   'Three calves and one foal were outside.'

   b. eno žrebe in tri teleta so bila zunaj.

   one foal and three calves aux been-NEUTER PL outside

   'One foal and three calves were outside.'

[Slovene]

When the data in (17) and (18) are taken seriously, the conclusion has to be drawn that neuter gender never percolates and that the only way to get neuter gender on the agreement target is to make use of Last Conjunct Agreement (LCA). Since this paper exclusively deals with Full Agreement (FA), we will leave the intricate agreement patterns in Slovene and Serbo-Croatian for further research.

4. Conclusion

In this article, we have argued that feature computation in coordination derives from the interaction of three assumptions about grammar which are independently necessary. First of all, feature computation is subject to the Law of the Coordination of Likes. This constraint requires that the label of the coordination reflects all and only those properties of the conjuncts that are not mutually exclusive. The feature composition of the coordination reflects this intersection of features. Secondly, we claim that the proper representation of person, number and gender features requires a

system of underspecification which interacts crucially with the LCL. Thirdly, we assume that the grammar contains a mechanism of 'default' agreement. We show that the interaction of these three assumptions rather elegantly derives the feature computation of person, gender and number features in English, Dutch and French; and of noun class features in Luganda and Bemba.

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