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Number agreement with coordinate nouns in Czech

1. Introduction

Coordination of nominal expressions raises interesting questions about plurality and agreement. Conjoined singular nouns are generally known to trigger plural agreement on the agreeing verb. However, it is not true that all coordination of two singular nouns must, or may, trigger plural agreement (Corbett (1983) among others), see (1). It is therefore useful to observe closely how the number of a coordinate expression can be determined and how agreement operates in case the verb agrees with a coordinate expression.

- (1) a. A boy and a girl are / *is reading different books.
b. There was / *were a boy and a girl reading different books.

This paper examines number agreement between coordinate subjects and their predicates and between coordinate nouns and their modifiers in Czech. It aims to provide an analysis of number agreement in these two configurations and, in particular, to account for the number feature of nominal expressions conjoined by the conjunction *a* ('and').

Before turning attention to agreement, two assumptions about the structure of coordination and nominal expressions in Czech have to be stated. First, I assume that coordinate expressions are *Conjunction Phrases* (ConjP) headed by the conjunction (Kayne (1994), Johannessen (1998)), as shown in (2). The first conjunct is the specifier and the second conjunct is the complement of the conjunction head. Second, I assume that Czech nominal expressions contain at least three syntactic projections shown in (3): a lexical NP projection, a functional NumP projection (Ritter 1994), and a functional DP projection (Szabolsci 1987). Modifiers are assumed to adjoin to DP or NumP projections (Stroik 1994, Svenonius 1994).

- (2) $[_{CoP} DP_1 [_{Co'} Co^\circ DP_2]]$ (Conjunction Phrase)

- (3) $[_{DP} D^\circ [_{NumP} Num^\circ [_{NP} N^\circ]]]$

The paper is organized as follows. The section 2 introduces basic agreement data in Czech. The section 3 shows there are two types of agreement with coordinate subjects (*full agreement* and *partial agreement*), and discusses their distribution. The section 4 provides an analysis of *full agreement*. It is argued that *full agreement* is a regular agreement between T and the ConjP in Spec-TP. The number of the ConjP is claimed to be located in the head of a number projection ΔP introduced above ConjP and computed by *Agree* (Chomsky 2000) between Delta and the conjunction head. The section 5 provides an analysis of *partial agreement*. It is argued here that *partial agreement* is *Agree* between T and the first conjunct in Spec-vP, which occurs in case the number phrase ΔP has not been projected. Finally, the section 6 shows that modifiers also agree either fully or partially with coordinate nouns. It is then claimed that the analysis of subject-verb agreement can equally account for agreement nouns-modifiers agreement.

2. Basic agreement data

Agreement is matching of feature specification between two separate elements, such as subject noun phrase and verb, or noun and modifier. In Czech, lexical verbs and the auxiliary

'be' agree with their subject in person and number. Past participles agree in number and gender. Modifiers agree with the modified noun in case, number and gender. Both cases are shown in (4).

- (4) a. Studenti si čtou v té nové knize.
 students-PL.M REFL read-3PL in this-LOC.SG.F new-LOC.SG.F book-LOC.SG.F
 'The students are reading in the new book.'
- b. Marie, přečetla jsi ty nové knihy ?
 Mary, read-SG.F AUX-2SG these-ACC.PL.F new-ACC.PL.F books-ACC.PL.F
 'Mary, did you read these new books ?'

In case of coordinate nouns, however, the feature specification on the conjoined noun phrases and the verb or the modifier may not match. This occurs especially when the conjuncts bear distinct features, because the verb and the modifier cannot bear two distinct feature specifications. Instead of bearing the features of all the conjuncts, the verb and the modifier bear the features of only one conjunct or features different from all conjuncts' features. So, in (5), one conjunct is first person singular, the other one is second person singular, and the verb is first person plural. In (6), one conjunct is singular masculine, the other one is singular feminine and the verb is plural masculine. That means that the verb agreeing with the coordinate subject in (5) and (6) bears the gender or the person feature of only one conjunct, and the number feature different from the features of both conjuncts¹.

- (5) a. [Já a ty] pojedeme / *pojedu / *pojedeš vlakem.
 I and you-SG will-go-1P / will-go-1SG / will-go-2SG by-train
 'Me and you are going by train.'
- b. [Ty a já] pojedeme / *pojedu / *pojedeš vlakem.
 you-SG and I will-go-1PL / will-go-1SG / will-go-2SG by-train²
- (6) a. Pes a kočka běželi / *běžely / *běžel / *běžela po trávníku.
 dog-SG.M and cat-SG.F ran-PL.M / ran-PL.F / ran-SG.M / ran-SG.F on lawn
 'The dog and the cat were running on the lawn.'
- b. Kočka a pes běželi / *běžely / *běžel / *běžela po trávníku.
 cat-SG.F and dog-SG.M ran-PL.M / ran-PL.F / ran-SG.M / ran-SG.F on lawn

The same patterns can be observed with post-nominal modifiers. So, in (7), one conjunct is singular masculine, the other one is singular feminine, and the modifier is plural masculine³. Prenominal modifiers behave differently since they can only bear the features identical to one conjunct, see (8). We discuss modifier agreement in more details in the section 6, after having analyzed subject-verb agreement.

- (7) a. otec a matka pyšní / *pyšný / *pyšná na svou dceru
 father-SG.M and mother-SG.F proud-PL.M / proud-SG.M / proud-SG.F of their daughter
 'the father and the mother proud of their daughter'

¹ The agreement in (5) and (6) is said to be determined by so-called *agreement resolution rules* (Corbett (1983) and (1988), Wechsler & Zlatić (2000) among others).

² If the examples (a) and (b) are equivalent, except for the order of the conjuncts, we only give the translation for (a).

³ Of course, if the modifier takes scope only over the second conjunct, it will be singular masculine in (7a) and singular feminine in (7b).

- b. matka **a** otec pyšný / *pyšný / *pyšná na svou dceru
 mother-SG.F and father-SG.M proud-PL.M / proud-SG.M / proud-SG.F of their daughter
- (8) a. *pyšný / pyšný / *pyšná otec **a** matka
 proud-PL.M / proud-SG.M / proud-SG.F father-SG.M and mother-SG.F
 'a proud father and a proud mother'
- b. *pyšný / *pyšný / pyšná matka **a** otec
 proud-PL.M / proud-SG.M / proud-SG.F mother-SG.F and father-SG.M

3. Subject-verb agreement

Let us now focus on subject-verb agreement in number. We have observed in the examples (5) and (6) above that the verb agreeing with a coordinate expression is plural despite the fact that both conjuncts are singular. This is not entirely surprising, since plural normally refers to two or more entities, as shown in (9a). Therefore, plural agreement with coordinate subjects in (9b) is usually considered as a semantic agreement. The plural semantic agreement in (9b) contrasts however with the singular agreement in (9c) which is also grammatical. Since the sentences (9b) and (9c) are otherwise identical, the coordination 'hungry cat and his kitten' seems to allow two agreements. Moreover, singular agreement is possible, even if the second conjunct is plural, see (9d)⁴.

- (9) a. Venku mňoukají / *mňouká hladové kočky.
 outside mew-3PL / mew-3SG hungry-PL cats-PL
 'Some hungry cats are meowing outside.'
- b. Venku mňoukají hladová kočka **a** její kotě.
 outside mew-3PL hungry-SG cat-SG and her kitten-SG
 'A hungry cat and her kitten are meowing outside.'
- c. Venku mňouká hladová kočka **a** její kotě. (=9b)
 outside mew-3SG hungry-SG cat-SG and her kitten-SG
- d. Venku mňouká hladová kočka **a** její kot'ata.
 outside mew-3SG hungry-SG cat-SG and her kittens-PL
 'A hungry cat and her kittens are meowing outside.'

The contrast between (9b) and (9c) indicates that there are two types of agreement with coordinate subjects: (i) plural agreement as in (9b) which can be called *full agreement*, and (ii) singular agreement as in (9c) which can be called *partial agreement* (Johannessen 1996).

In the next sections, I show that the realization of *full* and *partial agreement* depends at least on three factors: (i) the subject position, (ii) the semantic type of the conjuncts, and (iii) the kind of the predicate.⁵ I also show that *partial agreement* in (9c) is actually *agreement with the first conjunct* and that it contrasts both with full plural agreement and with full singular agreement.

⁴ But not if the first conjunct is plural, see section 3.1.

⁵ Number agreement also depends on the type of the conjunction: the conjunction 'and' normally requires plural agreement, while the conjunction 'or' prefers singular agreement, compare the contrast between (i) and (ii) from English, and between (iii) and (iv) from Czech :

(i) John and Mary are / *is reading a newspaper. (iii) Jan a Marie čtou / *čte noviny.
 (ii) John or Mary ???are / is reading a newspaper. (iv) Jan nebo Marie ??čtou / čte noviny.

In this paper, I only consider the conjunction *a* ('and').

3.1 Subject position

Subjects in Czech are either pre-verbal or post-verbal. As we have seen in (5) and (6), pre-verbal coordinate subjects trigger full agreement. On the other hand, post-verbal coordinate subjects as in (9) trigger either full or partial agreement. Looking carefully at the examples with post-verbal subjects, as in (10) and (11), we observe that the partially agreeing verb bears the features of the first conjunct. This is true not only for number, but also for gender and person feature. So, in (10a), the partially agreeing verb is singular masculine, whereas in (10b), the partially agreeing verb is singular feminine. In (11a), the partially agreeing verb is first person singular and in (11b) it is second person plural⁶.

- (10) a. Přišli / Přišel / *Přišla Jan **a** Marie.
 came-PL.M / came-SG.M / came-SG.M John and Mary
 'John and Mary came.'
 b. Přišli / *Přišel / Přišla Marie **a** Jan.
 came-PL.M / came-SG.M / came-SG.M Mary and John
- (11) a. Odešli jsme / *Odešli jste / Odešel jsem já **a** vy.
 left-PL AUX-1PL / left-PL AUX-2PL / left-SG AUX-1SG I and you-PL
 'Me and you left.'
 b. Odešli jsme / Odešli jste / *Odešel jsem vy **a** já.
 left-PL AUX-1PL / left-PL AUX-2PL / left-SG AUX-1SG you-PL and I

In fact, even if both conjuncts are plural, as in (12), the person and the gender features on the verb indicate that the verb can agree either fully or partially. The data in (10), (11) and (12) thus clearly show that post-verbal partial agreement is agreement with the first conjoined noun phrase.

- (12) a. Byli zvoleni / Byly zvoleny tři ženy **a** dva muži.
 were-PL.M elected-PL.M / were-PL.F elected-PL.F three women-PL.F and two men-PL.M
 'Three women and two men have been elected.'
 b. Byli zvoleni / *Byly zvoleny dva muži **a** tři ženy.
 were-PL.M elected-PL.M / were-PL.F elected-PL.F two men-PL.M and three women-PL.F

3.2 Semantic type of the conjuncts

Contrary to the examples observed above, some pre-verbal coordinations (of two singular conjuncts) only trigger singular agreement. We can thus observe the contrast like in (13). In (13a), the coordination triggers plural agreement, as expected, since it is pre-verbal. In (13b), the similar coordination, though pre-verbal, only triggers singular agreement. There is however semantic difference between these two coordinations: in (13a), the coordination denotes two distinct people, while in (13b) the coordination denotes a single person. The data in (13) show that agreement with pre-verbal subjects reflects the semantics of the conjuncts.

- (13) a. Můj nejlepší přítel **a** můj nejlepší kolega *onemocněl / onemocněli.
 my best friend and my best colleague fell-ill-SG.M / fell-ill-PL.M
 'My best friend and my best colleague fell (both) ill.'

⁶ 1 If 'vy' refers to only one person, the participle will be singular and the auxiliary plural:

(i) Odešel jste vy **a** já.
 left-SG AUX-2PL you-SG and I

- b. Můj nejlepší přítel **a** kolega onemocněl / *onemocněli.
 my best friend and colleague fell-ill-SG.M / fell-ill-PL.M
 'My best friend and colleague fell ill.'

Winter (2000) argues that the contrast between coordinations like (13a) and (13b) comes from both semantic and syntactic difference of the conjuncts. From the semantic point of view, the conjuncts in (13a) are arguments and the conjuncts in (13b) are predicates. From the syntactic point of view, the conjuncts in (13a) can be analyzed as DPs and the conjuncts in (13b) as NPs. As for agreement, the following generalization is not surprising: conjoined arguments require plural agreement, since they denote individuals, while conjoined predicates require singular agreement, since they denote properties.

According to this hypothesis, singular agreement in (13b) is not agreement with one conjunct only, but full singular agreement with coordinate NP predicates. Therefore, contrary to *post-verbal agreement*⁷, which is agreement either with the ConjP or with the first conjunct, *pre-verbal agreement* is agreement with the ConjP denoting one or more individuals.

Finally, there are also pre-verbal coordinations that allow both plural and singular agreement, as in (14).

- (14) a. Tato úpornost **a** jednostrannost **může** časem vyvolat protireakci.
 this stubbornness and partiality can-3SG by-time give-rise-to counter-response
 'Such a stubbornness and a partiality can, in the end, give rise to a negative response.
 b. Tato úpornost **a** jednostrannost **mohou** časem vyvolat protireakci.
 this stubbornness and partiality can-3PL by-time give-rise-to counter-reaction

It is possible to account for the coordination in (14) if the conjuncts here are analyzed as NumPs, which are following Winter (2000) semantically flexible between predicative and argumental reading. This flexibility would explain that conjoined NumPs trigger either singular or plural agreement depending on whether they are interpreted as predicates or as arguments. This hypothesis turns out to be correct since the conjuncts in (14) can actually be interpreted in two different ways: either as predicates as shown in (15a) by using the predicate 'to be one and the same thing', or as arguments as shown in (15b) by using the predicate 'to be two different properties'. Consequently, *pre-verbal singular agreement* in (14) is not agreement with one conjunct, but full agreement with coordinate NP predicates.

- (15) a. Úpornost **a** jednostrannost je pro něj jedna **a** tatáž věc.
 stubbornness and partiality is to him one and the-same thing
 b. Úpornost **a** jednostrannost jsou dvě různé vlastnosti.
 stubbornness and partiality are two different properties

3.3 Type of predicate

Finally, the possible realization of agreement depends on the kind of the agreeing predicate. From the semantic point of view, *first conjunct agreement* (FC agreement) is infelicitous with collective and reciprocal predicates⁸, contrary to distributive predicates, as shown in (16). The data in (16) show that *FC agreement* is not compatible with collective reading (see Aoun, Benmamoun & Sportiche 1994 for Arabic).

⁷ We call *post-verbal agreement* agreement with post-verbal subjects, and *pre-verbal agreement* agreement with pre-verbal subjects.

⁸ We use the term predicate to cover the verb, the VP or the verb and an adverbial (e.g. 'to come together', 'to come separately').

- (16) a. Tomu se smáli / smál jen Jan a Petr.
to-that REFL laughed-PL.M / laughed-SG.M only John and Peter
'John and Peter laughed at that.'
- b. V pět se setkali / *setkal Jan a Petr.
at five REFL met-PL.M / met-SG.M John and Peter
'John and Peter met at five o'clock.'
- c. Nakonec se vedle sebe posadili / *posadil Jan a Petr.
finally REFL beside oneself sat-PL.M / sat-SG.M John and Peter
'John and Peter finally sat beside each other.'

Kučerová (2001) claims that agreement also depends on the syntactic kind of predicate. According to her, inaccusative verbs like *přijet* ('to arrive') would allow both *full* and *FC agreement*, transitive verbs like *číst* ('to read') would only allow *full agreement*, and unergative verbs like *jmout* ('to grip') would only allow *FC agreement*, as shown in (17).

- (17) a. V pět přijela / přijeli Marie a Petr. (Kučerová 2001)
at five arrived-SG.F / arrived-PL.M Mary and Peter
'Mary and Peter arrived at five o'clock.'
- b. Knihu *četla / četli Marie a Petr.
book-ACC read-SG.F / read-PL.M Mary and Peter
'Mary and Peter were reading a book.'
- c. Jala / *Jaly nás hrůza a strach.
gripped-SG.F / gripped-PL.F/MIN us horror-SG.F and fear-SG.MIN
'We were gripped by horror and fear.'

Kučerová points out that the verb *jmout* ('to grip') in (17c) differs from the verbs *přijet* ('to arrive') and *číst* ('to read') in that it is only compatible with an existential subject. Such subject is known to be unable to rise to a pre-verbal position where it would be interpreted as a topic, as shown in (18). On the other hand, verbs like *přijet* ('to arrive') and *číst* ('to read') are well compatible with a pre-verbal topical subject that obligatorily triggers *full agreement*, see (19). The contrast between (18) and (19) suggests that *first conjunct agreement* is not only limited to post-verbal subjects, but that it is confined to a particular structural position (see section 5).

- (18) a. Jala nás hrůza.
gripped-SG.F us horror-SG.F
- b. ??Hrůza nás jala.
horror-SG.F us gripped-SG.F
- c. Hrůza a strach nás ???jala / *jal / *jaly. (=17c)
horror-SG.F and fear-MIN.SG us gripped-SG.F / gripped-SG.MIN / gripped-PL.F/MIN
- (19) a. Marie a Petr přijeli / *přijel(a) v pět. (=17a)
Mary and Peter arrived-PL.M / arrived-SG.M(F) at five
- b. Marie a Petr četli / *četl(a) knihu. (=17b)
Mary and Peter read-PL.M / read-SG.M(F) book-ACC

On the other hand, the infelicity of *first conjunct agreement* in (17b) cannot come from the verb *číst* ('read') itself, because the example (17b) becomes quite good if we change for

instance the definiteness of the object DP and the tense of the predicate, as in (20a), or if we change the number of the object DP and eventually insert an adverb, as in (20b).

- (20) a. Tuhle knihu četla / četli Marie **a** Petr.
 this book-ACC read-PAST.SG.F / read-PAST.PL.M Mary and Peter
 'This book, Mary and Petr have read it.'
 b. Knihy čte / čtou (často) Marie **a** Petr.
 books-ACC read-PRES.3SG.F / read-PRES.3PL.M (often) Mary and Peter
 'Mary and Peter (often) read books'.

3.4 Conclusion

The properties observed in this section lead to the conclusion that we have to distinguish two types of agreement with coordinate subjects: *full agreement* and *first conjunct agreement*. The actual realization of agreement depends (i) on the structural position of the subject (pre-verbal / post-verbal), (ii) on the semantic type of the conjuncts (arguments / predicates) and (iii) on the semantic kind of the predicate (collective / distributive).

Full agreement can be plural or singular depending on whether the conjuncts are arguments or predicates, independently from the subject position. *First conjunct agreement* can also be plural or singular depending on the number feature of the first conjunct. It only occurs with subjects in post-verbal position.

The agreement patterns with coordinate subjects are summarized in the table in (21).

(21) Agreement patterns with coordinate nominal expressions (NE)

Type of agreement	SV order	VS order	Type of NE
<i>Full agreement</i>	[NEsg/pl a NEsg/pl] Vpl [NEsg a NEsg] Vsg	Vpl [NEsg/pl a NEsg/pl] Vsg [NEsg a NEsg]	NE = argument NE = predicate
<i>First conjunct agreement</i>	— —	Vsg [NEsg a NEsg/pl] Vpl [NEpl a NEsg/pl]	NE = argument NE = argument

4. Analysis of Full Agreement

4.1 A number projection within ConjP

In order to account for full agreement, which is agreement with the whole coordinate expression, we first have to determine the number feature of the *Conjunction Phrase*. One possibility to do that is to claim, as does for instance Gertrude de Vries (1992), that the conjunction 'and' bears a plural number feature. However, such an analysis cannot explain why post-verbal subjects can trigger either plural or singular agreement. It is also problematic to the extent that the plural feature would not be checked in non-nominal coordinations, unless we postulate two conjunctions 'and', 'and[+pl]' and 'and[Ø]'.

Instead of assuming that conjunction itself bears a number feature, I propose that nominal coordinate phrases contain a number projection whose head bears the number feature of the whole coordinate expression. This proposal is inspired by Creissels' (1997) analysis of comitative coordination in tswana. Creissels analyzes the comitative sequence 'Kitso le Mpho' in (22a) as a PP complement of a head D, as shown in (22c). Importantly, the head D can be realized by an overt morpheme *bo* which marks the plural, see (22b). The examples (22a) and (22b) are equivalent.

- (22) a. Kitso le Mpho
 Kitso COMIT Mpho
 'Kitso and Mpho'
 b. **bo** Kitso le Mpho (=22a)
 PL Kitso COMIT Mpho
 'Kitso and Mpho'
 c. $[_{DP} [_{D'} (bo) [_{PP} [_{DP1} Kitso] [_{P'} le [_{DP2} Mpho]]]]]$

Following the analysis in (22c), I propose to introduce into the structure of the coordination a functional number projection that I call *Delta Phrase* (ΔP). The head Delta (Δ) bears the syntactic number feature of the *Conjunction Phrase*, as shown in (23). In Czech (and other many languages), this head will be null.

- (23) $[_{\Delta P} \Delta^\circ [\pm PL] [_{CoP} D/NP_1 [_{Co'} Co^\circ D/NP_2]]]$

An independent argument for my proposal comes from the distribution of the adverb *respectively* in languages like French. The adverb 'respectively' can modify a coordinate DP, but not a plural DP, as shown in (24). More precisely, 'respectively' can only modify plural DPs that contain an explicit or an implicit number, as shown in (25).

- (24) a. Pierre **et** Jean jouent respectivement de la guitare et du piano.
 Peter and John play-3PL respectively the guitar and the piano
 b. *Les enfants jouent respectivement de la guitare et du piano.
 the children play-3PL respectively the guitar and the piano
 (25) a. trois points désignés respectivement par a, b et c
 three points designated-PL respectively as a, b et c
 b. les parents veillent respectivement à l'éducation de leurs enfants
 the parents⁹ attend-3PL respectively to the upbringing of their children
 c. ils ont respectivement 10,12 et 15 ans
 they have respectively 10, 12 and 15 years
 'they are 10, 12 and 15 years old respectively'

The data in (25) show that *respectively* requires a number indication inside the noun phrase, which I assume is located in the Spec-NumP. If we analyze the data in (25) as in (26), we see that in (26a), the Spec-NumP contains an explicit number *three*, in (26b), the Spec-NumP contains an implicit number *two*, and in (26c), the Spec-NumP contains a big *PRO* controlled by the antecedent of the plural anaphoric pronoun.

- (26) a. $[_{DP} [_{NumP} trois [_{Num'} points_i [_{NP} t_i]]]] désignés respectivement par a, b et c$
 b. $[_{DP} les [_{NumP} (2) [_{Num'} parents_i [_{NP} t_i]]]] veillent respectivement à l'éducation de leurs enfants$
 c. $[_{DP} [_{NumP} PRO_i [_{Num'} ils_i]]] ont respectivement 10, 11 et 15 ans$

Contrary to the examples in (25), the Spec-NumP of the generic nominal phrase 'the children' in (24b), contains an arbitrary big *PRO*, which excludes *respectively*, as shown in (27b) Now, the fact that *respectively* is felicitous in (24a) implies that here, the coordination expression

⁹ Parents are mother and father, i.e. two people.

contains a number phrase with an implicit number in its specifier which licenses respectively. I propose thus that (24a) has the structure in (27a), which is an instantiation of the proposal in (23).

- (27) a. $[_{DP} (2) [_{D'} [+PL] [_{CoDP} \text{Pierre et Jean}]]]$ jouent respectivement de la guitare et du piano.
 b. * $[_{DP} \text{les} [_{NumP} \text{PRO}_{arb} [_{Num'} \text{enfants}_i [_{NP} t_i]]]]$ jouent respectivement de la guitare et du piano.

4.2 Computation of the number feature on DP

We now need to say how to compute the number feature of this *Delta* head. I propose to proceed in three steps.

First, we have to determine the semantic type of the conjuncts, as in (28). Recall that NPs/predicates trigger non-plural agreement, DPs/arguments trigger plural agreement, and NumPs/predicates or arguments either non-plural or plural agreement.

- (28) a. $NP = \langle e, t \rangle \Rightarrow [-PL]$
 b. $DP = \langle \langle e, t \rangle, t \rangle \Rightarrow [+PL]$
 c. $NumP = \langle e, t \rangle$ or $\langle \langle e, t \rangle, t \rangle \Rightarrow [-PL]$ or $[+PL]$

Second, assume that the conjunction is of the semantic type $\langle \alpha, \langle \alpha, \alpha \rangle \rangle$ where α stands for any semantic type of the conjuncts (Rebuschi 2001). Then we can determine the semantic value of the conjunction according to (29).

- (29) a. Conjunction of arguments : $Conj = \langle T, \langle T, T \rangle \rangle$ where $T = \langle \langle e, t \rangle, t \rangle$
 b. Conjunction of predicates : $Conj = \langle P, \langle P, P \rangle \rangle$ where $P = \langle e, t \rangle$

Third, the number of the head Δ will be determined by *Agree* between *Delta* and the conjunction. The conjunction of arguments will agree with the head *Delta* having the value $[+PL]$, since coordinate arguments trigger plural agreement. The conjunction of predicates will agree with the head *Delta* having the value $[-PL]$, since coordinate predicates trigger singular agreement, as shown in (30).

- (30) a. $[_{AP} \Delta^\circ [+PL] [_{CoP} DP_1 [_{Co'} Co^\circ \langle T, \langle T, T \rangle \rangle DP_2]]]$
 b. $[_{AP} \Delta^\circ [-PL] [_{CoP} NP_1 [_{Co'} Co^\circ \langle P, \langle P, P \rangle \rangle NP_2]]]$
-

5. Analysis of first conjunct agreement

5.1 Against clausal coordination

Since *first conjunct (FC) agreement* only allows for distributive reading, one possibility would be to analyze it as a regular subject-verb agreement within one of two conjoined clauses, as shown in (31a). Such analysis is adopted by Aoun, Benmamoun and Sportiche (1994) to account for Arabic data. However, this analysis implies that the structure of clauses which exhibit *FC agreement* and that of clauses which exhibit *full agreement* radically differ, compare (31a) and (31b).

- (31) a. $[_{CoP} [\text{tuhle knihu četla Marie}]]$ a $[\text{tuhle knihu četl Petr}]$ (FC agreement)
 this book read-SG.F Mary and this book read-SG.M Peter

- b. *tuhle knihu četli* [_{CoP} *Marie a Petr*] (full agreement)
 this book read-PL.M Mary and Peter

But the main point against a clausal analysis is the fact that it requires an important reduction in the second conjoined clause. Such reduction requires, however, either the presence of the adverb 'also' in the reduced conjunct, as in (32a), or a pause before the conjunction, as indicated by the comma in (32b). On the other hand, the clauses with *FC agreement* as in (32c) do not require any prosodic nor syntactic marking. I thus conclude that *FC agreement* in Czech does not result from clausal coordinations.

- (32) a. Jan přišel **a** Marie (*také).
John came-SG.M, and Mary (too)
'John came and Mary too.'
- b. Přišel Jan, **a** (také) Marie.
came-SG.M John, and (also) Mary
John came, and also Mary came.
- c. Přišel Jan **a** Marie.
came-SG.M John and Mary
'John and Mary came.'

5.2 Two agreement configurations

We have seen in the section 3.3 that there are predicates that only admit post-verbal subjects and *FC agreement*. This suggests that *FC agreement* is triggered by subjects in a particular structural position. Munn (1999) has already argued that *full agreement* and *FC agreement* occur in two different structural configurations. In Munn's analysis, the conjunction is a Boolean operator, which adjoins to the first conjunct at LF and forms a plural *Boolean Phrase*, by agreeing with its conjuncts. *Full agreement* is thus agreement between the head T and the *Boolean Phrase* in Spec-TP, see (33a). But before the operator has adjoined, there is no plural *Boolean Phrase* and the head T can only agree with the first conjunct, as in (33b)¹⁰.

- (33) a. $[_{BP} \mathbf{B}^{\circ} [_{NP1} NP_1 [_{BP} \mathbf{B}^{\circ} NP_2]]] \mathbf{T}^{\circ}$ (full agreement)
 b. $\mathbf{T}^{\circ} [_{NP1} \mathbf{NP}_1 [_{BP} \mathbf{B}^{\circ} NP_2]]$ (FC agreement)

Besides postulating that coordinate phrases are always plural (which we have seen is not true in Czech), Munn's analysis, also based on Arabic data, does not say anything about full post-verbal agreement. On the contrary, it predicts that predicates always agree fully with pre-verbal subjects and partially with post-verbal subjects. Consequently, the analysis in (33) implies that full post-verbal agreement occurs in one of the contexts represented in (34). In one context, represented in (34a), the verb agrees with the ConjP in Spec-TP and then moves above T to appear before the subject. In the other context, represented in (34b), the verb and the ConjP agree in a projection between TP and vP (which is the position of post-verbal subject) before the verb moves to T in order to appear before the subject¹⁰.

- (34) a. $[_{CP} \dots [_{C'} V [_{TP} S [_{T'} (V) [_{vP} (S) [_{VP} (V)]]]]]]$
 b. $[_{TP} [_{T'} V] [_{XP} S [_{X'} (V) [_{vP} (S) [_{VP} (V)]]]]]]$

¹⁰ Agreeing elements are in bold font.

Since it is quite difficult to argue for one or the configuration in (34) to be available in Czech, I'd rather assume that *full agreement* always obtain between T and Spec-TP, and *first conjunct agreement* between T and Spec-vP. Consequently, I propose to account for full and first conjunct agreement in the following way (see Skrabalova 2004):

Full pre-verbal agreement is a regular agreement between the coordinate phrase ΔP (i.e. the number phrase of the ConjP) in Spec-TP and T. This agreement occurs when the coordinate subject actually moves to Spec-TP, as in (35a).

If the post-verbal subject belongs to the focus of the sentence and does not move to Spec-TP, two cases may come up. In one case, the features of the coordinate phrase ΔP move to Spec-TP and agree with T and we obtain full post-verbal agreement (see Babyonyshev 1997). This must occur when a semantically plural element (collective predicate) is present in the clause and requires a plural feature on the subject. In the other case, neither the ΔP nor its features have to move to Spec-TP. This is only possible if no semantically plural element occurs in the clause (thus in case of distributive reading). In such case, I suggest the ΔP has not projected or its features have not been computed for economy reasons, since the coordinate phrase has not been activated by movement (see Munn 1999). Consequently, T cannot agree with the features of the ΔP . Therefore, T agrees with the features of the nearest possible target, i.e. the first conjunct. We thus obtain post-verbal first conjunct agreement with the subject in Spec-vP, as in (35c).

- (35) a. $[_{TP} \Delta P_i T^\circ [_{vP} t_i]]$ (full SV agreement)
 b. $[_{TP} \Phi_i T [_{vP} \Delta P_i]]$ (full VS agreement)
 c. $[_{TP} T [_{vP} DP_1 \text{ Conj } DP_2]]$ (first conjunct VS agreement)

The analysis of FC agreement proposed here correctly predicts the following properties that have been observed in the section 3 above: (i) *FC agreement* only occurs in VS order, (ii) *FC agreement* is only felicitous with distributive reading, (iii) the verbs like *jmout* ('to grip') only allow *FC agreement*, since their subjects never move to Spec-TP position, see (36).

- (36) a. V Evropě vypukl / *vypukly hladomor a cholera.
 in Europe broke-out-SG.MIN / broke-out-PL.MIN famine-SG.MIN and cholera-SG.F
 'Famine and cholera broke out in Europe.'
 b. *Hladomor a cholera vypukl(y) v Evropě.
 famine-SG.MIN and cholera-SG.F broke-out-SG.MIN(PL.MIN) in Europe

6. Agreement between conjoined nouns and their modifiers

6.1 Full and partial agreement with modifiers

Let us now consider how the analysis of subject-verb agreement sketched in (35) can account for agreement between conjoined nouns and their modifiers. Conjoined nouns can of course be each modified by its own pre-nominal or post-nominal modifier. The cases we are interested here are the cases where both conjuncts are modified by a single modifier.

When a pre-nominal modifier takes scope over both conjuncts, it can only agree with the first conjoined noun, as shown in (37)¹¹. Full agreement with the whole coordinate expression is not possible. This applies to both relational and qualifying adjectives, compare (37a) and (37b).

¹¹ The examples in (37) are ambiguous since the adjective can modify either the first conjunct only, or both conjuncts. The agreement is however identical in the two cases.

- (37) a. španělský / *španělská / *španělští král **a** královna
 Spanish-SG.M / Spanish-SG.F / Spanish-PL.M king-SG.M and queen-SG.F
 'the King and the Queen of Spain'
- b. slavná / *slavný / *slavní herečka **a** herec
 famous-SG.F / famous-SG.M / famous-PL.M actress-SG.F and actor-SG.M
 'a famous actress and a famous actor'

On the other hand, when a post-nominal modifier takes scope over both conjuncts, it must agree with the whole coordination, as indicated by brackets in (38a). If it agrees with the second conjunct, it only modifies that conjunct, as indicated in (38b).

- (38) a. [chlapeček **a** holčička], *špinavý / *špinavá / špinaví od hlavy až k patě
 boy-SG.M and girl-SG.F dirty-SG.M / dirty-SG.F / dirty-PL.M from head to heel
 'the boy and the girl, (both) dirty from top to toe'
- b. chlapeček **a** [holčička *špinavý / špinavá / *špinaví od hlavy až k patě]
 boy-SG.M and girl-SG.F dirty-SG.M / dirty-SG.F / dirty-PL.M from head to heel
 'the boy and the girl dirty from top to toe'

The coordination like in (37a) can have either the structure in (39a) or that in (39b). The structure in (39b) seems preferable to the extent that the shared modifier in (39b) c-commands both conjuncts and can thus take scope over both of them, while the elliptic modifier in (39a) is not c-commanded by its antecedent. I assume thus that pre-nominal modifiers adjoin to the first coordinate projection CoDP.

- (39) a. [_{CoDP} [_{DP} španělský král] **a** [_{DP} ~~španělská~~ královna]]
 Spanish-SG.M king-SG.M and Spanish-SG.F queen-SG.F
- b. [_{CoDP} španělský [_{CoD} [_{DP} král] **a** [_{DP} královna]]]

If we use both a pre-nominal and **a** post-nominal modifier, as in (40a), the pre-nominal modifier still agrees with the first conjunct, and the post-nominal modifier with the whole coordination. This implies that the pre-nominal modifier is lower than the post-nominal one. I assume thus that post-nominal modifiers adjoin to the maximal constituent (Δ P) containing the coordinate DP and the prenominal modifier, as proposed in (40b).

- (40) a. španělský král **a** královna, velmi oblíbení v cizině
 Spanish-SG.M king-SG.M and queen-SG.F very popular-PL.M abroad
 'the King and the Queen of Spain, very popular in foreign countries'
- b. [_{Δ P} [_{CoDP} [_{ModP} španělský] [_{CoDP} král **a** královna]] [_{ModP} velmi oblíbení v cizině]]

6.2 Agreement analysis

The data in (37) through (40) show there is a parallel between subject-verb agreement on the one hand and modifier-noun agreement on the other hand, except for full agreement with pre-nominal modifiers. This parallel is illustrated in (41).

- (41) a. Full agreement (type S-V): [NEsg **a** NEsg] Vpl / MODpl
 b. Full agreement (type V-S): Vpl / *MODpl [NEsg **a** NEsg]
 c. First conjunct agreement: Vsg / MODsg [NEsg **a** NEsg]

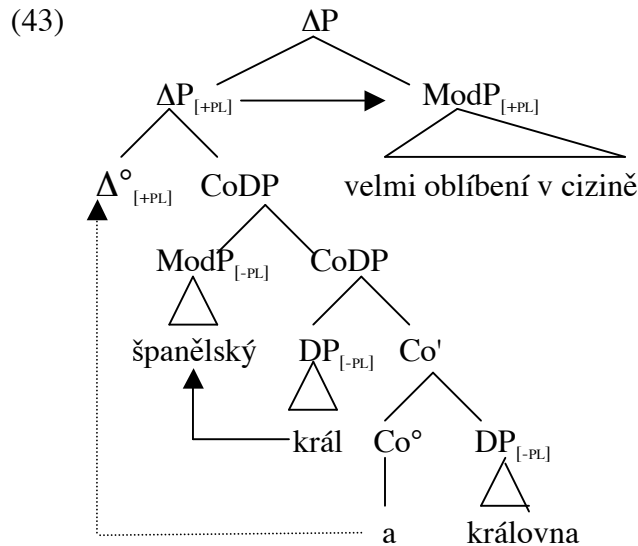
I claim that the analysis of subject-verb agreement in (35) correctly predicts the patterns of noun-modifier agreement. Assuming the structure in (40), the agreement analysis runs in the following way:

Post-nominal modifiers follow the whole coordinate nominal expression and adjoin to it. That means that they occur in *full agreement* configuration and therefore agree with the whole coordinate phrase, as shown in (42a).

Pre-nominal modifiers precede the coordinate nominal expression and adjoin; therefore, they occur in *first conjunct agreement* configuration and agree with the first noun, see (42b). Since pre-nominal modifiers always precede the noun, they behave like verbs that do not admit pre-verbal subjects. Consequently, we never obtain full agreement with prenominal modifiers.

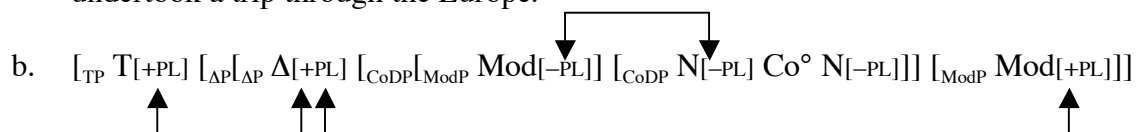
- (42) a. *Full agreement* (type S-V) : $[_{\Delta P} \Delta P [_{DP} DP_1 \text{ Conj } DP_2]] [_{ModP} \mathbf{MOD}]$
 b. *First conjunct agreement* (type V-S) : $[_{\Delta P} [_{ModP} \mathbf{MOD} [_{DP} DP_1 \text{ Conj } DP_2]]]$

The syntactic structure of (40) with both *full* and *FC agreement* is represented in (43).



The analysis in (42) predicts that *full agreement* requires the number feature of the ΔP to be computed. Consequently, it implies that *full agreement* on modifiers is not possible with FC agreement on the verb, since FC agreement occurs in case the ΔP has not been projected (or its features have not been computed). The example (44a) shows that this prediction is correct.

- (44) a. Po Evropě podnikli / ???podnikl cestu španělský král
 through Europe undertook-PL.M / undertook-SG.M trip Spanish-SG.M king-SG.M
 a královna, velmi oblíbení v cizině.
 and queen-SG.F very popular-PL.M abroad
 'The King and the Queen of Spain, (who are) very popular in foreign countries,
 undertook a trip through the Europe.'



7. Conclusion

In this paper, I showed there are two types of agreement with coordinate nouns: *full agreement*, which can be plural or singular, according to the semantic type of the conjuncts, and *first conjunct agreement* (plural or singular), which only occurs when the agreeing element precedes the coordinate nouns. I also showed that these two types of agreement exist in subject-verb agreement as well as in modifier-noun agreement.

In order to account for full agreement, I argued that coordinate phrases (*Conjunction Phrases*) contain a number projection *Delta Phrase* (ΔP) that bears the number feature of the whole coordinate expression. The number feature ($\pm PL$) of *Delta Phrase* is computed by *Agree* between the head Δ and the conjunction head according to the semantic value of the conjunction (predicative= $-PL$ /argumental= $+PL$), which is determined by the semantic type of the conjuncts (predicates/ arguments). Consequently, *full agreement* has been analyzed as a regular agreement between T and the ΔP (or its features) in Spec-TP. On the other hand, *first conjunct agreement* has been analyzed as a default agreement between T and the first conjunct in Spec-vP in case the ΔP had not been projected (or its features had not been computed). This may only occur if the coordinate phrase stays *in situ* (Spec-vP), i.e. is not activated by movement, and no plurality element requiring plural subject is present in the clause.

The proposed analysis also accounts for agreement with modifiers, since modifiers following the coordinate nouns agree fully (S-V type) and those preceding them agree partially (V-S type). But pre-verbal modifiers cannot agree fully, since they are not free to appear either in prenominal or postnominal position, contrary to the verbs, which can appear before or after the subject.

The different agreement patterns are thus explained as results of three concurring factors: structural position of coordinate subject (in situ or moved) and of the modifiers (higher or lower adjunction site), semantics of the coordinate nouns and compatibility with plurality requirements of other elements present in the clause.

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