Plural Comitative Constructions in Polish

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Abstract

This paper provides a treatment of Polish Plural Comitative Constructions in the paradigm of HPSG in the tradition of Pollard and Sag (1994). Plural Comitative Constructions (PCCs) have previously been treated in terms of coordination, complementation and adjunction. The objective of this paper is to show that PCCs are neither instances of typical coordinate structures nor of typical complement or adjunct structures. It thus appears difficult to properly describe them by means of the standard principles of syntax and semantics. The analysis proposed in this paper accounts for the syntactic and semantic properties of PCCs in Polish by assuming an adjunction-based syntactic structure for PCCs, and by treating the indexical information provided by PCCs not as subject to any inheritance or composition, but as a result of applying a set of principles on number, gender and person resolution that also hold for ordinary coordinate structures.

1 Introduction

In Polish, there are several types of Comitative Constructions (CCs), i.e., expressions that, generally speaking, (i) involve a PP headed by the preposition *z* 'with' and (ii) denote a relation between two (sets of) individuals / objects such that either (iia) one accompanies the other in an action / event / situation denoted by the predicate or (iib) they are both members of a set of equal participants involved in an action / event / situation denoted by the predicate. (1)–(5) provide examples of CC types that appear in Polish.

(1)

Jan	z	Marią	wyjechał.
Jan.NOM.SG	with	Maria.INSTR.SG	left.SG

'Jan left with Maria.'

(2)

Jan	wyjechał	z	Marią.
Jan.NOM.SG	left.SG	with	Maria.INSTR.SG

'Jan left with Maria.'

(3)

Jan	z	Marią	wyjechali.
Jan.NOM.SG	with	Maria.INSTR.SG	left.PL

'Jan and Maria left.'

(4)

My	z	Marią	wyjechaliśmy.
we	with	Maria.INSTR.SG	left.PL

T1: 'We left with Maria.'
T2: 'Maria and I left.'
T3: 'Maria and the rest of us left.'

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(5) *pro* Z Marią wyjechaliśmy.
pro with Maria.INSTR.SG left.PL
T1: 'We left with Maria.'
T2: 'Maria and I left.'
T3: 'Maria and the rest of us left.'

In the CC in (1), the preposition *z* 'with' takes the instrumental NP *Marią* 'Maria' and combines with the nominative NP *Jan* 'Jan'. This sentence involves number, gender and person agreement between the nominative NP and the predicate. The interpretation of the CC in (1) is strictly comitative, i.e., the individual denoted by the NP selected by the preposition is interpreted as the comiter of the individual denoted by the NP modified by the *z*-PP (interpreted as the comitant).

The *z*-PP in strict CCs does not have to appear adjacent to the NP denoting the comitant. (2) exemplifies a CC in which the *z*-PP appears separated from the nominative NP, and is combined with the VP. This CC, however, has exactly the same interpretation as the CC in (1).[1]

Other types of CCs are constructions involving plural agreement on the verb. The first type consists of a singular NP and a *z*-PP and combines with plural predicates, as illustrated in (3). Note that, in contrast to the CCs in (1) and (2), the interpretation of the CC in (3) does not provide any comitative content in the proper sense. Both of the individuals denoted by the NP selected by the *z*-PP and the individual denoted by the NP combined with the *z*-PP, are involved in the event denoted by the predicate as equal participants. The comitant-comiter relationship is not accessible here.

The second type of CCs with plural agreement on the verb are expressions containing plural personal pronouns, as in (4). As indicated by the translations T1–T3, the sentence in (4) provides three possible interpretations. According to the first interpretation (see the translation T1), the first person plural pronoun *my* 'we' denotes a set of individuals including the speaker but not including the individual denoted by the NP selected by the preposition *z*, that is, *Maria*. In contrast, the meaning of the pronoun *my* 'we', according to the interpretation indicated by the translation T2, includes both the denotation of *Maria* and the speaker. It does not include any further individuals, and thus carries the meaning *Maria and I*. Finally, the pronoun *my* 'we' according to the third interpretation (see the translation T3) refers to a set of individuals including the speaker, the individual denoted by the argument of the preposition *z* 'with', i.e., *Maria*, as well as some further individuals. Note that the second and third person plural pronouns display the same ambiguity when used in CCs, such as in (4).[2]

[1]For a discussion on CCs of the types in (1) and (2), see McNally (1993), Vassilieva and Larson (2001), Feldman (2002), Ionin and Matushansky (2002) and Dyła and Feldman (to appear) for Russian, Comacho (1994) for Spanish and Dyła (1988) for Polish data.

[2]See Ladusaw (1989), Progovac (1997), Vassilieva and Larson (2001), Feldman (2002) and Ionin and Matushansky (2002) for a disquisition on Russian plural pronoun CCs, den Dikken et al. (2001) for a discussion on Hungarian data, Dyła (1988) for Polish, Aissen (1989) for Tzotzil, and Schwartz

Finally, comitative constructions such as (5), often referred to in the linguistic literature as verb-coded coordination (cf. Schwartz (1988) and Camacho (1994)) are possible in Polish. As in the case of plural pronoun CCs (cf. (4)), this kind of CC provides three interpretations relating to the denotation of *pro*. As reflected in the translations T1–T3 in (5), *pro* can be interpreted in three different ways, analogously with plural pronouns.[3]

This paper focuses exclusively on CCs of the type exemplified in (3) and leaves detailed investigations of remaining CCs for future work. Because of the plural agreement on the predicate, and in interest of being consistent with previous approaches, CCs such as in (3) will be referred to throughout this paper as Plural Comitative Constructions (PCCs).

PCCs have previously been treated by linguists in terms of coordination, complementation and adjunction. Most of these analyses, however, remain problematic in some respects. The objective of this paper is to show that PCCs are neither instances of typical coordinate structures, nor instances of typical complement or adjunct structures. It thus appears difficult to properly describe them by means of the standard principles on syntax and semantics.

The analysis proposed in this paper accounts for the syntactic and semantic properties of PCCs by (i) assuming an adjunction-based syntactic structure for PCCs, (ii) describing idiosyncratic properties of PCCs, such as the symmetry of both NPs, and ensuring a uniform theta-role assignment to these NPs by the lexical entry of the preposition *z* 'with', and (iii) licensing number, gender and person resolution by particular principles that construct the indexical information provided by entire PCCs. The principles of number, gender and person resolution also apply to ordinary coordinate structures in Polish.

2 Crucial Properties of PCCs

The following section characterizes PCCs with respect to number, gender and person resolution, as well as their behaviour with respect to coreference. All properties described in this section in the context of PCCs also apply to Polish coordination.

2.1 Number Resolution

As has already been mentioned in the Introdution, PCCs, although they contain only singular NPs, involve plural agreement on the predicate (cf. (3) restated here as (6)).

(1988) for an examination of plural pronoun CCs based on data from Yapese, Hungarian, Polish and Bulgarian.

[3]Verb-coded coordination has previously been discussed in Comacho (1994) and Comacho (2000) for Spanish, in Aissen (1989) for Tzotzil and in Schwartz (1988) for Dakota, Yapese, Kanuri, Bulgarian, Hungarian, Polish, Hausa and Chilean Spanish.

(6) Jan z Marią wyjechali.
Jan.NOM.SG with Maria.INSTR.SG left.PL
'Jan and Maria left.'

The examples below show that PCCs can also act as controllers of plural relative pronouns (cf. (7)) and can be modified by plural attributive adjectives (cf. (8)).

(7) Piotr zobaczył Jana z Marią, którzy właśnie przyszli.
Piotr saw Jan.SG with Maria.SG who.PL just arrived
'Piotr saw Jan and Maria, who had just arrived.'

(8) Jan z Marią, zaproszeni przez Piotra, przyszli punktualnie.
Jan.SG with Maria.SG invited.PL by Piotr arrived on time
'Jan and Maria, invited by Piotr, arrived on time.'

The examples in (6)–(8) indicate that the NP *z* NP cluster bears a plural valued number category.

2.2 Gender Resolution

The next interesting observation can be made with respect to gender resolution. As one can see in (9), whenever a PCC involves a masculine-human (M1) NP, regardless of whether it is a nominative or an instrumental NP, the gender value of the predicate is also masculine-human.[4]

(9)

Ojciec z synem father.M1 with son.M1 'The father and the son'	Syn z ojcem son.M1 with father.M1 'The son and the father'	
Ojciec z psem father.M1 with dog.M2 'The father and the dog'	Pies z ojcem dog.M2 with father.M1 'The dog and the father'	
Ojciec z oddziałem father.M1 with department.M3 'The father and the department'	Oddział z ojcem department.M3 with father.M1 'The department and the father'	wrócili. came back.M1 'left.'
Ojciec z matką father.M1 with mother.FEM 'The father and the mother'	Matka z ojcem mother.FEM with father.M1 'The mother and the father'	
Ojciec z dzieckiem father.M1 with child.NEUT 'The father and the child'	Dziecko z ojcem child.NEUT with father.M1 'The child and the father'	

[4]According to the traditional approach to gender of Saloni and Świdziński (1998), based on Mańczak (1956), the gender system of contemporary Polish consists of five grammatical genders: *masculine-human* / (M1) or (VIRILE) (e.g., *chłopiec* 'boy'), *masculine-animal* (M2) (e.g., *pies* 'dog'), *masculine-inanimate* (M3) (e.g., *stół* 'table'), *feminine* (FEM) (e.g., *dziewczyna* 'girl') and *neuter* (NEUT) (e.g., *okno* 'window'). This approach has been adopted here.

The examples in (9) show that both NPs participate in gender resolution. Further evidence for the involvement in gender resolution of both NPs embedded in a PCC can also be provided by relative pronoun constructions and attributive modification. For lack of space, no examples will be provided here, however.[5]

2.3 Person Resolution

The involvement of both NPs can also be observed in person resolution, as the examples in (10) illustrate. If different persons are contained in a PCC, the first person has priority over the second and the second over the third. Thereby, the order of NPs bearing different person values does not affect person resolution.

(10) a. To przecież właśnie ja z tobą, jako najwięksi aktywiści
it though just I.1ST with you.2ND as best activists
w naszym ugrupowaniu, zorganizowaliśmy ten protest.
in our group organized.1ST this protest
'It was just me and you, who, as the best activists in our group, organized this protest.'

b. To przecież właśnie ja z nim, jako najwięksi aktywiści
it though just I.1ST with him.3RD as best activists
w naszym ugrupowaniu, zorganizowaliśmy ten protest.
in our group organized.1ST this protest
'It was just he and I, who, as the best activists in our group, organized this protest.'

c. To przecież właśnie ty z nim, jako najwięksi aktywiści
it though just you.2ND with him.3RD as best activists
w naszym ugrupowaniu, zorganizowaliście ten protest.
in our group organized.2ND this protest
'It was just he and you, who, as the best activists in our group, organized this protest.'

2.4 Coreference

Another observation that can be made relates to coreference phenomena. As illustrated in (11), only the entire NP *z* NP cluster can bind reflexive possessive pronouns and PRO subjects of infinitive and participial clauses.

(11) a. [Jan$_i$ z Marią$_j$]$_k$ odwiedzili swego$_{*i/*j/k}$ przyjaciela.
Jan with Maria visited RFL.POSS.PRN friend
'Jan and Maria visited their friend.'

[5]For a more detailed discussion on gender resolution in Polish and in other Slavonic languages see Corbett (1983). See also Dyła (2003) for a discussion on gender resolution in Polish plural pronoun CCs.

b. [Jan$_i$ z Marią$_j$]$_k$ chcieli PRO$_{*i/*j/k}$ wyjechać.
Jan with Maria wanted PRO leave
'Jan and Maria wanted to leave.'

c. PRO$_{*i/*j/k}$ spakowawszy się, [Jan$_i$ z Marią$_j$]$_k$ wyjechali.
PRO having packed Jan with Maria left
'Having packed, Jan and Maria left.'

2.5 Summary of Present Observations

Summing up the present observations, one can conclude that (i) the number value of the NP *z* NP cluster is plural, (ii) both NPs participate in gender resolution, (iii) both NPs participate in person resolution, (iv) the entire NP *z* NP cluster acts as a controller of possessive reflexive pronouns and PRO subjects.

It has been observed that with regard to these properties, PCCs behave as typical coordinate structures. As a result, several coordination-based approaches to PCCs have been developed. In the next section, the most significant of these will be presented.

3 Coordination-Based Approaches

This section discusses coordination-based approaches to PCCs, in which the analyses of Vassilieva and Larson (2001), Dyła (1988) and Dyła and Feldman (to appear) will be presented. The objective of this section is to briefly address the shortcommings of these particular analyses and to summarize arguments against the treatment of PCCs as coordinate structures.

3.1 Vassilieva and Larson (2001)

Vassilieva and Larson (2001) propose a syntactic structure for Russian PPCs that corresponds to a syntactic structure of ordinary coordination (cf. (1)). Here, both NPs (or rather DPs, according to Vassilieva and Larson (2001)) involved, and the preposition, all form separate constituents, as depicted below.

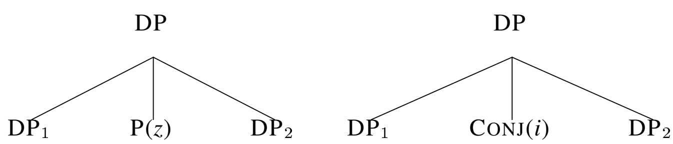

Figure 1: The structure of PPCs and coordinations according to Vassilieva and Larson (2001)

While this analysis might work for Russian, it does not apply to Polish PCCs. Firstly, it does not explain how the case assignment to the DP$_2$ works. Further, the inversion of DP$_1$ and DP$_2$, which is possible in a typical coordination (cf. (12)), cannot be ruled out and, consequently, the licensing of ungrammatical sentences such as that in (13b) cannot be prevented.[6]

(12) a. Jan i Maria wyjechali.
Jan and Maria left
'Jan and Maria left.'

b. Maria i Jan wyjechali.
Maria and Jan left
'Maria and Jan left.'

(13) a. Jan z Marią wyjechali.
Jan with Maria left
'Jan and Maria left.'

b. *Marią z Jan wyjechali.
Maria.INST with Jan left

Finally, the analysis of Vassilieva and Larson (2001) does not account for grammatical structures such as that in (14), where in addition to the preposition *z* 'with', an alleged conjunction, the proper conjunction *i* 'and' is present.

(14) Jan z Marią i z Anną wyjechali.
Jan with Maria and with Anna left
'Jan, Maria and Anna left.'

As the example in (15) illustrates, the coexistence of multiple conjunctions in parallel is ungrammatical in Polish.

(15) Jan i Maria (*oraz) i Anna wyjechali.
Jan and Maria and and Anna left
'Jan, Maria and Anna left.'

3.2 Dyła (1988) and Dyła and Feldman (to appear)

Dyła (1988) examines Polish PCCs and treats them as instances of conjunctionless binary coordination, as in Figure 2. The preposition *z* 'with' is analyzed as a clitic combining with an instrumental NP. The instrumental NP acts as the head of the *z* NP cluster.

[6]Note, however, that free reshuffling conjuncts occur only in multiple conjunct coordination. In binary coordination, the order of conjuncts is rigid (cf. (i) provided by Stefan Dyła, p.c.).

(i) a. Zarówno Kwaśniewski jak i Belka spotkali się z Bushem.
both Kwaśniewski as and Belka met RM with Bush
'Both Kwaśniewski and Belka met Bush.'

b. *Jak i Belka zarówno Kwaśniewski spotkali się z Bushem.
as and Belka both Kwaśniewski met RM with Bush
'Both Belka and Kwaśniewski met Bush.' [intended]

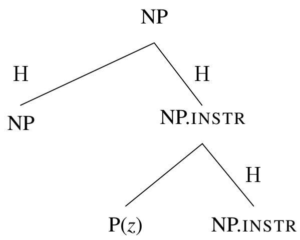

Figure 2: The structure of PCCs according to Dyła (1988)

A similar analysis has been proposed by Dyła and Feldman (to appear). It differs from that provided by Dyła (1988) only in that it assumes a different internal structure for the *z* NP cluster (cf. Figure 3). The *z* NP cluster is treated here as a PP headed by the preposition *z* 'with', analyzed as a weak head as understood by Abeillé (2003).

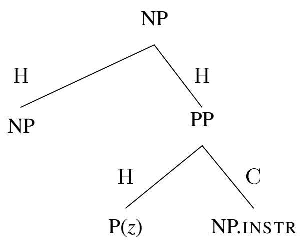

Figure 3: The structure of PCCs according to Dyła and Feldman (to appear)

As has been rightly observed by McNally (1993), treating PCCs as cases of coordinate structures fails to explain the difference in the distribution of possessive and reflexive possessive pronouns in ordinary coordinate structures and in PCCs (cf. (16)).[7]

(16) a. Zarówno Jan$_i$ jak i jego$_i$ / *swoja$_i$ żona wyjechali.
both Jan as and his / RFL.POSS.PRN wife left
'Both Jan and his wife left.'

b. Jan$_i$ z(e) ?jego$_i$ / ?swoją$_i$ żoną wyjechali.
Jan with his / RFL.POSS.PRN wife left
'Jan left with his wife.'

While a clear contrast in the usage of possessive and reflexive possessive pronouns can be observed in coordination (cf. *jego* vs. *swoja* in (16a)), no such differ-

[7] Note, however, that the Russian data provided in McNally (1993) is, for lack of indices, not precise concerning the reference of pronouns. Despite what the examples in McNally (1993) seem to indicate, Russian non-reflexive possessive pronouns cannot be coreferent with first NPs. (I thank Anna Feldman, p.c., for pointing this out to me.)

ence can be found in PCCs.[8] Given this, it seems plausible to assume two different structures for ordinary coordination and PCCs.[9]

3.3 Further Arguments against Coordination-Based Analyses

The most critical point in analyzing PCCs as coordinate structures is the case assignment to the second NP, which is marked for instrumental. By definition, there are no instances of coordination in which there is case assignment.

A further unexpected property of the treatment of PCCs as coordination is the fact that PCCs, unlike ordinary coordination, do not allow categories other than nouns. While not only NPs but also VPs, APs and other kinds of phrases, as well as mixed categories, are possible in ordinary coordination, only NPs can be included in PCCs.

Further, PCCs allow for pro-drop, while ordinary coordination does not (cf. (17) vs. (18)).[10]

(17) a. On i Maria poszli do kina.
he and Maria went to cinema
'He and Maria went to the cinema.'

b. **pro* I Maria poszli do kina.
pro and Maria went to cinema

[8]According to Dyła (1988), the usage of both irreflexive possessive and reflexive possessive pronouns referring to first NPs in Polish PCCs is ungrammatical. However, the native speakers of Polish interviewed for the purpose of this paper judge sentences like (16b) to be somewhat unnatural but acceptable. But even though no possessive pronouns coindexed with the first NP were possible in PCCs, there would still be a contrast between ordinary coordination and PCCs with respect to the occurrence of ordinary possessive pronouns, as has been pointed out to me by Stefan Dyła, p.c.. While they are acceptable in the case of ordinary coordination, they are not within the PCC.

[9]Note that none of the previous binding theories for Polish seem to be able to account for data as in (16b) (cf. Reinders-Machowska (1991) or Marciniak (2001)), however, this paper is not an attempt to provide an appropriate theory. It should only be noticed here that the treatment of pronouns within PCCs does not require a separate binding theory, as a number of binding phenomena in Polish pose a challenge to the previous binding theories in the same respects as PCCs (cf. the sentences below).

(i) Żaden autor$_i$ swoich$_i$ powieści nie ma do nich stosunku obiektywnego.
no author RFL.POSS.PRN novels not has to them relationship objective
'No author has an objective relationship with his own novels.'

(ii) Ta książka$_i$ o życiu jej$_i$ autora kosztuje 10 Euro.
this book about life its author costs 10 euros
'This book about the life of its author costs 10 euros.'

[10]Recall that sentences such as (18b) have three possible readings, as has been already indicated in the Introduction on the basis of the example in (5). In (18b), only that reading is considered which corresponds to the translation T2 in (5). The remaining two readings are ignored here. As Stefan Dyła, p.c., pointed out, both (18a) and (18b) are also ambiguous with respect to the interpretation of the NP *bratem* 'brother', which can involve either the speaker (cf. *my brother*) or the denotations of the pronouns *on* 'he' and *pro* respectively (cf. *his brother*).

(18) a. On z bratem poszli do kina.
He with brother went to cinema
'He and his brother went to the cinema.'

b. *pro* Z bratem poszli do kina.
pro with brother went to cinema
'He and his brother went to the cinema.'

And finally, PCCs behave differently from coordination with respect to Across-the-Board extraction. In a coordinate structure, the same constituent may be moved out of each conjunct.[11] This, however, seems not to be possible within PCCs (cf. the examples in (19a) and (19b) provided by Stefan Dyła, p.c.). The contrast between (19a) and (19b) seems to argue against a coordination-based analysis.

(19) a. Czyim$_i$ dowodziłeś [t_i ojcem] i [t_i bratem]?
whose commanded.2ND.SG t father and t brother
'Whose father and brother was under your command?'

b. */??Czyim$_i$ dowodziłeś [t_i ojcem] z [t_i bratem]?
whose commanded.2ND.SG t father with t brother
'Whose father and brother was under your command?' [intended]

3.4 Summary of Arguments against Coordination-Based Analyses

To sum up the arguments against the coordination-based treatment of PCCs, one can state that (i) PCCs involve internal case assignment, (ii) proper conjunctions can appear in PCCs, (iii) there is no contrast in the usage of possessive vs. reflexive possessive pronouns in PCCs, as is the case in ordinary coordination, (iv) the category of both phrases involved in PCCs is limited to nouns, (v) pro-drop is possible in PCCs, and finally, (vi) PCCs do not allow Across-the-Board extraction.

Recall, however, that PCCs behave as typical coordinate structures with regard to number, gender and person resolution, as well as with respect to coreference phenomena.

4 A Complementation-Based Approach

An interesting approach to Russian PCCs has been proposed by Feldman (2002). According to this proposal, the Russian *s* 'with' as used in PCCs, is a transitive noun, that selects for an instrumental NP and a subject NP. (cf. the structure of a sample PCC in Figure 4).[12]

The approach of Feldman (2002) correctly describes number resolution in PCCs, makes correct predictions about the distribution of reflexive possessive pronouns in

[11] See Ross (1967).

[12] The $i + j$ description used as the INDEX value of the entire PCC has been taken from Feldman (2002). We assume that this specification simply acts as a new variable and that it has nothing to do with mathematical summation.

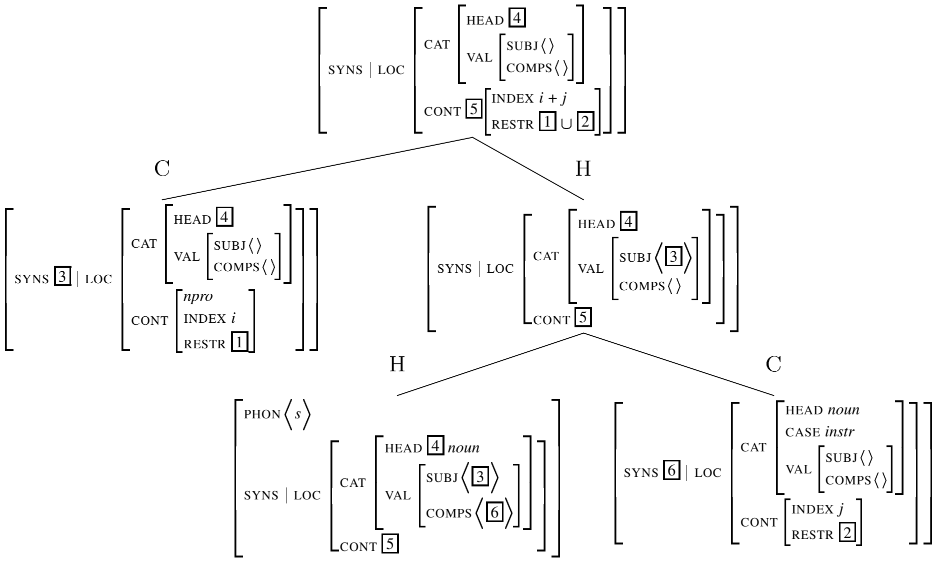

Figure 4: The structure of an exemplary PCC according to Feldman (2002)

Russian PCCs and ensures that the first NP always varies in case, while the second NP is always instrumental. However, by treating *s* 'with' as a noun, the modifiability of the *s* NP cluster by collectivizing adverbs such as *vmeste* 'together' cannot be explained, since adverbs are traditionally considered as not being able to modify nominal objects, only events / actions / situations, denoted by VPs and PPs. As in the approach of Feldman (2002), the *z* NP cluster is treated as a nominal object, no adverb modification can be licensed, at least, not without providing special lexical entries for collectivizing adverbs.

Also, the vocalic alternation of *s* 'with' (i.e., *s* vs. *so*) appears unexpectedly when considering it a noun, as proposed in Feldman (2002). Such an alternation is typical for prepositions and not for nouns.

5 Adjunction-Based Approaches

This section presents two adjunction-based approaches to PCCs: the approach of McNally (1993) and our own approach. For an adjunction-based transformational approach to PCCs and other types of comitative constructions in Russian, see also Ionin and Matushansky (2002).

5.1 McNally (1993)

McNally (1993) analyzes PCCs in terms of an NP adjunction (cf. the structure in Figure 5).

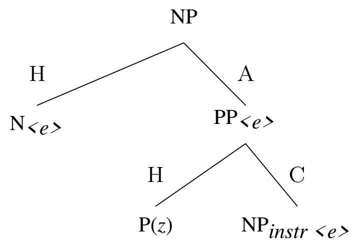

Figure 5: The structure of PCCs according to McNally (1993)

The adjunction-based analysis of McNally (1993) correctly predicts that (i) the category of phrases connected by the preposition *z* 'with' is nominal, (ii) the case of the first NP is assigned by the predicate, while the case of the second NP is assigned by the preposition *z* 'with', (iii) neither NP can be inverted, (iv) the *z* PP can be conjoined with another *z* PP by means of proper conjunctions, (v) no Across-the-Board extraction is possible.

McNally (1993) claims, however, that PCCs may involve only referential NPs, that is, NPs which have well-defined type $<e>$ denotations in addition to generalized quantifier-type denotations (type $<<e, t>, t>$). While ordinary coordination can involve any combination of referential and non-referential NPs, PCCs involve only referential NPs.

To account for number resolution, McNally (1993) proposes that the *z*-PP denotes the same semantic type as the NP contained within it, that is, type $<e>$ in terms of Montague (1974). This fact, according to McNally (1993), would allow an operation which joins individuals of type $<e>$ to unite the entity denoted by the NP heading the PCC, with that denoted by the *z*-PP. The result would be a plural entity which could serve as an agreement controller.

To illustrate her claim, McNally (1993) provides, among others, the following Polish example involving non-referential NPs. Sie judges (20) to be ungrammatical.

(20)	*Każdy	chłopak	z	każdą	dziewczyną	odtańczyli	polkę...
	each	boy.SG	with	each	girl.INSTR.SG	danced.PL	polka

However, according to the judgments of native Polish speakers interviewed for the purpose of this paper, (20) is fully acceptable under the interpretation for the situation in which each boy danced the polka and each girl danced the polka (cf. the simplified formalization in (21)).

(21) $\forall x(boy(x) \rightarrow \textbf{dance'}(x)) \wedge \forall y(girl(y) \rightarrow \textbf{dance'}(y))$

Only the interpretation in which each boy-girl pair danced the polka (cf. the simplified formalization in (22)) seems to be excluded here.[13] Note, however, that some native speakers accept even this interpretation.

[13]The $\oplus$ symbol stands for the sum formation in terms of Link (1991).

(22) $\forall x \forall y (boy(x) \wedge girl(y) \rightarrow \textbf{dance'}(x \oplus y))$

McNally (1993)'s claim that only referential NPs can be involved in PCCs seems thus too strong, at least for Polish.

Further evidence against treating the *z*-PP as an expression of type *<e>* is the fact that the PP can be modified by the adverb *razem* 'together' and by other collectivizing adverbs, such as *wraz* 'together', *łącznie* 'jointly', *wespół* 'jointly', *wspólnie* 'together / jointly', *włącznie* 'inclusive', etc., which usually combine with expressions of types higher than the type *<e>* (e.g., VPs or PPs).

Finally, the approach of McNally (1993) does not account for gender and person resolution in PCCs.

5.2 Our Proposal

In the following, a treatment of PCCs will be proposed according to which PCCs are analyzed as instances of NP adjunction, as in McNally (1993)'s approach. However, in contrast to the approach of McNally (1993), the *z*-PP will be treated here as an ordinary PP of the semantic type *<e <e, t> >*. Number, as well as gender and person resolution are accounted for by virtue of particular principles that also apply to ordinary coordination.

In Figure 6, a lexical entry for the preposition *z* 'with' as it appears in PCCs is provided.

$$\begin{bmatrix} \textit{word} \\ \text{PHON} \langle z \rangle \\ \text{ARG-ST} \left\langle \begin{bmatrix} \text{LOC} \begin{bmatrix} \text{CAT | HEAD | MORSYN} \begin{bmatrix} \textit{noun} \\ \text{ARG | CASE } \textit{instr} \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \text{INDEX } \boxed{1} \\ \text{RESTR } \left\{ \begin{bmatrix} \text{NUCL | INSTANCE } \boxed{1} \end{bmatrix} \right\} \cup \boxed{2} \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{SYNS | LOC} \begin{bmatrix} \text{CAT | HEAD | MORSYN} \begin{bmatrix} \textit{prep} \\ \text{PFORM } z \\ \text{MOD} \begin{bmatrix} \text{LOC} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD | MORSYN | } \textit{noun} \\ \text{VAL | COMPS} \langle\rangle \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \text{INDEX } \boxed{3} \\ \text{RESTR } \left\{ \begin{bmatrix} \text{NUCL | INSTANCE } \boxed{3} \end{bmatrix} \right\} \cup \boxed{4} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \text{INDEX } \boxed{e} \\ \text{RESTR} \left\{ \begin{bmatrix} \text{NUCL} \begin{bmatrix} \textit{conjoin-rel} \\ \text{INST } \boxed{e} \\ \text{CONJUNCTS} \left\{ \boxed{1}, \boxed{3} \right\} \end{bmatrix} \end{bmatrix} \right\} \end{bmatrix} \end{bmatrix} \end{bmatrix} \wedge$$

$$\left(\boxed{4}\,\textit{neset} \rightarrow \boxed{2}\,\textit{neset} \right) \wedge \left(\boxed{4}\,\textit{eset} \rightarrow \boxed{2}\,\textit{eset} \right)$$

Figure 6: The lexical entry of the preposition *z* 'with'

Here, the approach to agreement proposed in Czuba and Przepiórkowski (1995) has been adopted, based on Kathol (1999)[14] and elaborated for Polish in Przepiórkowski et al. (2002). According to this approach, linguistic signs contain informa-

[14] See also Wechsler and Zlatić (2001) for a similar approach.

tion on their number, gender and, in the case of verbs, person at two representation levels, that is, at both the semantic and the morphosyntactic level. The semantic agreement features are provided, as in the traditional approach of Pollard and Sag (1994), by means of the value of the attribute INDEX via the following path: SYNSEM | LOCAL | CONTENT | INDEX, while the morphosyntactic agreement features are provided by the attribute AGR(EEMENT) via the following path: SYNSEM | CATEGORY | HEAD | MORSYN | AGR.

Further, a uniform feature geometry for all *content* objects has been assumed. The CONTENT value is, thus, the *content* object containing an index as well as the semantic restrictions of this index. The CONTENT value of the preposition *z* 'with' as appears in PCCs thus provides an event variable in terms of Davidson (1967) and a *conjoint-relation* for which the attribute CONJUNCTS is appropriate, taking a set of indices as its value.[15] This specification allows one to account for the distributive reading provided by PCCs.[16]

The lexical entry in Figure 6 also ensures that NPs involved in PCCs must have similar modification (see the tags $\boxed{2}$ and $\boxed{4}$). As McNally (1993) and Dyła and Feldman (to appear) have observed that when NPs in PCCs combine with determiners or adjectives, each must occur with the same determiner or similar adjectives.

To account for number resolution, the principle in Figure 7 has been provided. This ensures that if in a head-adjunct-structure the adjunct-daughter is the preposition *z* 'with' providing the *conjoin-relation*, the number of the entire structure is plural. Note that the same holds for coordination.

$$\begin{bmatrix} \textit{head-adjunct-structure} \\ \text{ADJUNCT-DTR} \mid \text{SYNS} \mid \text{LOC} \begin{bmatrix} \text{CAT} \mid \text{HEAD} \mid \text{MORSYN} \mid \text{PFROM } z \\ \text{CONT} \mid \text{RESTR} \left\{ \begin{bmatrix}\text{NUCL } \textit{conjoin-rel}\end{bmatrix}, \ldots \right\} \end{bmatrix} \end{bmatrix} \longrightarrow$$

$$\begin{bmatrix}\text{SYNS} \mid \text{LOC} \mid \text{CONT} \mid \text{INDEX} \mid \text{NUMBER } \textit{plural}\end{bmatrix}$$

Figure 7: The principle of number resolution

To describe gender resolution in PCCs, the following rules for gender resolution, proposed by Corbett (1983), have been adopted: (i) if there is at least one masculine-human conjunct, the masculine-human form is used; (ii) if the con-

[15] Note that, given this, a slight modification of the hierarchy under the sort *index* must be undertaken.

[16] For lack of space, the behavior of PCCs with respect to the distributive versus collective reading will not be discussed here in detail. It should only be noted that, in contrast to McNally (1993)'s view, which assumes only collective readings of PCCs, Polish PCCs can be interpreted as having both distributive and collective denotations. In this respect, Polish PCCs show the same properties as Russian PCCs, discussed in Dalrymple et al. (1998). Dalrymple et al. (1998) claim, moreover, that there are no differences in the denotation of PCCs, simple plural NPs and coordinate structures. Detailed investigations on whether or not this claim can be applied to Polish plural expressions will be left, however, for future work.

For a discussion on the interpretation of Polish PCCs, see Dyła and Feldman (to appear).

juncts include the semantic features male and human, the masculine-human or non-masculine-human form is used; (iii) if there is at least one masculine-animate conjunct, the masculine-human or non-masculine-human form is used; (iv) otherwise the non-masculine-human form is used. Figure 8 presents the HPSG formalization of these rules.[17]

$$\forall \boxed{1} \forall \boxed{3} \begin{bmatrix} \textit{head-adjunct-structure} \\ \text{ADJUNCT-DTR} \begin{bmatrix} \text{SYNS} \mid \text{LOC} \begin{bmatrix} \text{CAT} \mid \text{HEAD} \mid \text{MORSYN} \mid \text{PFORM } z \\ \text{CONT} \mid \text{RESTR} \left\{ \left[\text{NUCL} \mid \text{CONJUNCTS } \boxed{1} \right], \ldots \right\} \\ \text{CONX} \mid \text{BACKGROUND } \boxed{3} \end{bmatrix} \end{bmatrix} \end{bmatrix} \longrightarrow$$

$$\left(\begin{array}{l} \left(\begin{array}{l} \left[\text{SYNS} \mid \text{LOC} \mid \text{CONT} \mid \text{INDEX} \mid \text{GENDER } \textit{m1} \right] \\ \wedge \exists \boxed{2} \left(\mathtt{member}\left(\boxed{2} \left[\text{GENDER } \textit{m1} \right], \boxed{1} \right) \right) \end{array} \right) \vee \\ \left(\begin{array}{l} \left[\text{SYNS} \mid \text{LOC} \mid \text{CONT} \mid \text{INDEX} \mid \text{GENDER } \textit{m1} \vee \textit{non-m1} \right] \\ \wedge \exists \boxed{2} \left(\mathtt{member}\left(\boxed{2}\, \textit{male}, \boxed{1} \right) \right) \wedge \exists \boxed{4} \left(\mathtt{member}\left(\boxed{4}\, \textit{human}, \boxed{3} \right) \right) \end{array} \right) \vee \\ \left(\begin{array}{l} \left[\text{SYNS} \mid \text{LOC} \mid \text{CONT} \mid \text{INDEX} \mid \text{GENDER } \textit{m1} \vee \textit{non-m1} \right] \\ \wedge \exists \boxed{2} \left(\mathtt{member}\left(\boxed{2} \left[\text{GENDER } \textit{m2} \right], \boxed{1} \right) \right) \end{array} \right) \vee \\ \left(\begin{array}{l} \left[\text{SYNS} \mid \text{LOC} \mid \text{CONT} \mid \text{INDEX} \mid \text{GENDER } \textit{non-m1} \right] \\ \wedge \neg \exists \boxed{2} \left(\mathtt{member}\left(\boxed{2} \left[\text{GENDER } \textit{m1} \vee \textit{m2} \right], \boxed{1} \right) \right) \quad \wedge \neg \exists \boxed{4} \left(\mathtt{member}\left(\boxed{4}\, \textit{male}, \boxed{3} \right) \right) \end{array} \right) \end{array} \right)$$

Figure 8: The principle of gender resolution

The following rules for person resolution, adopted from Corbett (1983) and formalized in Figure 9, have been assumed: (i) if the conjuncts include a first person, first person agreement forms are used; (ii) if the conjuncts do not include a first person and include a second person, second person agreement forms are used, (iii) if the conjuncts include neither a first nor a second person, third person agreement forms are used.[18]

Finally, the principles in (23) and (24), adopted here from Sag et al. (2003) but adapted for our analysis, will ensure the correct percolation of semantic information along syntactic structures.

(23) SEMANTIC COMPOSITIONALITY PRINCIPLE
In any well-formed phrase structure, the mother's RESTR value is the sum of the RESTR values of the daughters.

[17]For the purpose of this paper, the rules for gender resolution have been adopted in a somewhat simplified form. However, a more detailed study on gender resolution in Polish is needed with regard to morphosyntactic, semantic or, more precisely, pragmatic / contextual features, as well as combinations of these. The rules of Corbett (1983) do not seem to consider all possibilities of gender resolution in Polish.

[18]As an alternative, the extension of the ontology by a special subtype of *head-adjunct-structure* for PCCs could be considered, which would correspond to constructional HPSG approaches. The constraints on number, gender and person resolution would then apply to this particular type. Here, however, a fixed signature has been assumed, which should be kept as small as possible.

$$\forall \boxed{1} \left[\begin{array}{l} \textit{head-adjunct-structure} \\ \text{ADJUNCT-DTR} \left[\text{SYNS} \mid \text{LOC} \left[\begin{array}{l} \text{CAT} \mid \text{HEAD} \mid \text{MORSYN} \mid \text{PFORM } \textit{z} \\ \text{CONT} \mid \text{RESTR} \left\{ \left[\text{NUCL CONJUNCTS } \boxed{1} \right], \ldots \right\} \end{array}\right]\right]\end{array}\right] \longrightarrow$$

$$\left(\begin{array}{l}
\left(\begin{array}{l} \left[\text{SYNS} \mid \text{LOC} \mid \text{CONT} \mid \text{INDEX} \mid \text{PERSON } \textit{1st}\right] \\ \wedge\ \exists \boxed{2} \left(\texttt{member}\left(\boxed{2}\left[\text{PERSON } \textit{1st}\right], \boxed{1}\right)\right) \end{array}\right) \vee \\
\left(\begin{array}{l} \left[\text{SYNS} \mid \text{LOC} \mid \text{CONT} \mid \text{INDEX} \mid \text{PERSON } \textit{2nd}\right] \\ \wedge\ \exists \boxed{2} \left(\texttt{member}\left(\boxed{2}\left[\text{PERSON } \textit{2nd}\right], \boxed{1}\right)\right) \wedge \neg\ \exists \boxed{3} \left(\texttt{member}\left(\boxed{3}\left[\text{PERSON } \textit{1st}\right], \boxed{1}\right)\right) \end{array}\right) \vee \\
\left(\begin{array}{l} \left[\text{SYNS} \mid \text{LOC} \mid \text{CONT} \mid \text{INDEX} \mid \text{PERSON } \textit{3rd}\right] \\ \wedge\ \neg\ \exists \boxed{2} \left(\boxed{2}\left[\text{PERSON } \textit{1st} \vee \textit{2nd}\right] \wedge \texttt{member}\left(\boxed{2}, \boxed{1}\right)\right) \end{array}\right)
\end{array}\right)$$

Figure 9: The principle of person resolution

(24) SEMANTIC INHERITANCE PRINCIPLE
In any headed phrase except for the head-adjunct phrase in which the adjunct daughter is headed by the comitative preposition *z*, the mother's INDEX values are identical to those of the head daughter.

The tree in Figure 10 displays the structure of the sentence in (6) according to the analysis proposed, and illustrates the interaction of the principles on number, gender and person resolution, as well as the above semantic principles.

By virtue of the lexical entry in Figure 6, the comitative preposition *z* 'with' is licensed, which selects for the instrumental NP *Marią* 'Maria', forming an ordinary PP. The PP *z Marią* 'with Maria' may be modified by collectivizing adverbs, such as *razem* 'together'. As a typical preposition, *z* 'with' undergos a vocalic alternation when it appears in specific phonological environments (cf. *z Marią* 'with Maria' vs. *ze Stasiem* 'with Staś'). The PP *z Marią* 'with Maria' can also be conjoined with other comitative PPs (cf. (14)).

By means of constraints on adjunct-head-structures, the *z*-PP modifies the NP *Jan* 'Jan'. The phrase *Jan z Marią* 'Jan and Maria' forms a head-adjunct-structure. With the exception of the INDEX value, the phrase *Jan z Marią* 'Jan and Maria' is a result of applying the standard principles of grammar, such as THE HEAD FEATURE PRINCIPLE or THE SEMANTIC COMPOSITIONALITY PRINCIPLE. The INDEX value of the phrase *Jan z Marią* 'Jan and Maria' is constructed by the constraints on number, gender and person resolution in Figure 7, Figure 8 and Figure 9, respectively. The resulting INDEX value serves as an agreement controller.

Note, however, that the phrase *Jan z Marią* 'Jan and Maria' also contains a *singular* valued NUMBER feature (see $\boxed{7}$). The mixed specification of NUMBER values on this phrase allows one to account for sentences as in (25).

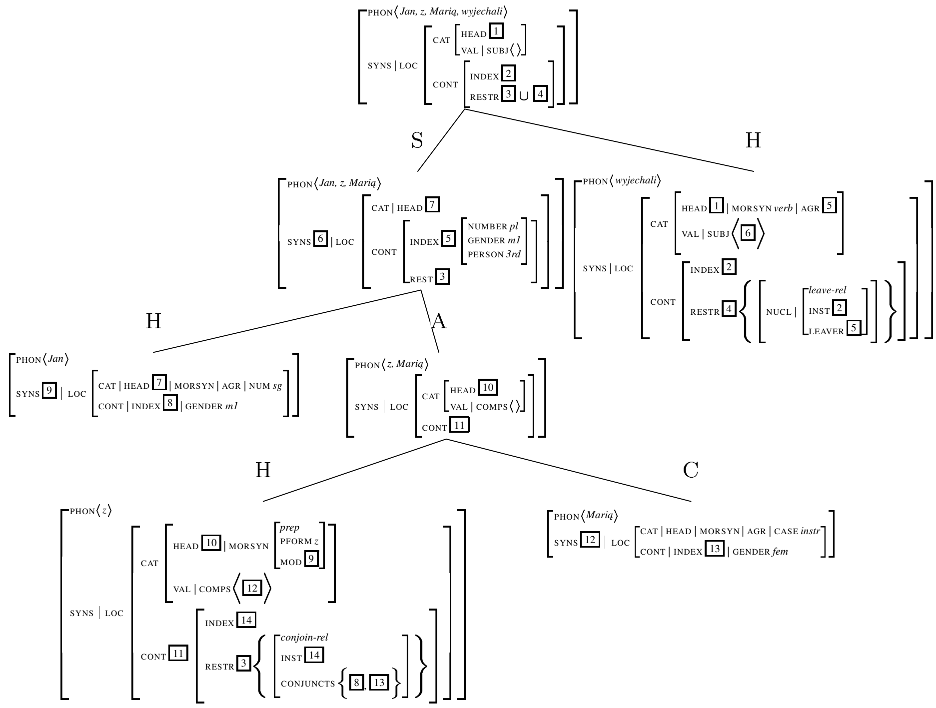

Figure 10: The structure of the sentence *Jan z Marią wyjechali* ‘Jan and Maria left’

(25) a. Polski prezydent z premierem wyjechali.
Polish.SG president.SG with prime minister.SG left.PL
‘The Polish president and the prime minister left.’

b. Przybył prezydent z premierem, długo oczekiwani.
arrived.SG president.SG with prime minister.SG long expected.PL
‘The president and the prime minister, expected for a long time, arrived.’

In (25a), the PCC *prezydent z premierem* ‘the president and the prime minister’ combines with a plural predicate and a singular adjective.[19] In (25b), the PCC occurs with both a singular predicate and a plural participle at the same time.

6 Summary and Outlook

In this paper, crucial properties of Polish PCCs have been discussed, and shortcomings of previous approaches to PCCs have been presented. An adjunction-based HPSG analysis has been proposed that accounts for number, gender and

[19]Note, however, that the sentence in (25a) has two readings. According to the first one, the adjective modifies only the first NP, i.e., *prezydent* ‘president’. According to the second reading, the adjective modifies the entire PCC, i.e., *prezydent z premierem* ‘the president and the prime minister’. For pragmatical reasons, the second reading is preferred.

person resolution, coreference phenomena, modifiability by collectivizing adverbs, idiosyncratic properties of PCCs, mixed agreement, and other features of PCCs.

This analysis accounts for the syntactic and semantic properties of PCCs in Polish by (i) assuming an adjunction-based syntactic structure for PCCs, (ii) describing idiosyncratic properties of PCCs, such as the symmetry of NPs involved in PCCs, and ensuring a uniform theta-role assignment to these NPs by the lexical entry of the preposition *z* 'with', and (iii) assuming that indices of PCCs are not subject to any inheritance or composition, but are constructed by a set of principles on number, gender and person resolution, which also apply to ordinary coordinate structures.

In future work, other types of comitative constructions will be investigated with the goal being the uniform treatment of all Polish comitatives.

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