Agreement under Case Matching in Polish *co* and *który* Relative Clauses Headed by Numerically Quantified Nouns*

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Abstract: This paper aims to describe subject-verb agreement patterns within Polish *co* and *który* relative clauses in which the relativized subject head noun (virile and non-virile) modified by a higher numeral is assigned genitive case. Such subjects in Polish obligatorily induce default 3sg. neut. agreement on the main-clause verbal predicate. However, when the same subject is relativized while also being the relative-clause subject, various agreement options may occur depending on the type of relative marker as well as the grammatical gender of the head noun. In order to examine these agreement possibilities, a survey was conducted measuring Polish native speakers' acceptability judgments. These patterns suggest that both *co* and *który* relatives could be derived via a matching analysis because they both allow optionality of agreement in certain environments. Furthermore, this optionality can be accounted for in terms of Case attraction and syncretism of case found in the paradigms of higher numerals and the relative pronoun *który*.

1. Polish Relative Markers *który* and *co*

In general, Polish relative clauses, henceforth RCs, can be introduced by the relative pronouns *kto* 'who', *co* 'what', ***który*** 'which' (1a), or *jaki* 'what kind', the relative adverbs *kiedy* 'when', *gdzie* 'where', *jak* 'how', and *dlaczego* 'why', as well as the uninflected relative marker ***co*** 'that' (1b).[1]

(1) a. pióro, **którym** pisałem
     pen$_{SG.N}$ which$_{SG.N.INST}$ wrote

[1] Therefore, there are two types of *co*, namely the relative pronoun and the relative marker. Whereas the former inflects for case and can be used only in light-headed RCs (Citko 2004), the latter remains uninflected and can be used in headed RCs, in which case the resumption strategy is employed to reflect case marking.

(1) b.   pióro,   **co**   nim   pisałem
          a pen$_{SG.N}$ that   with-what$_{SG.N.INST}$ wrote

     'a pen I wrote with'

The relative pronouns *kto*, *co*, and the relative adverbs *kiedy*, *gdzie*, *jak*, and *dlaczego* are considered to be simplex *wh*-pronouns (Citko 2004: 100–02) that function only in light-headed relatives. In this type of relative, the relativized nominal head is either an indefinite, a negative indefinite, a universal, or a demonstrative pronoun. On the other hand, the D-linked relative pronouns *który* and *jaki* require a nominal restriction and are used to relativize full nominal heads in so-called headed relatives (Citko 2004). They are considered the only permitted relative pronouns in this type of RC and are used with both animate and inanimate heads. Agreement between the pronoun and the RC head is in gender and number but not case, as in (2):[2]

(2) Mężczyzna,   **którego**   spotkałem wczoraj,   jest   lekarzem.
     man$_{SG.M.NOM}$ which$_{SG.M.ACC}$ met   yesterday   AUX$_{3SG}$ doctor

     'The man who I met yesterday is a doctor.'

However, apart from these two relative pronouns, Polish headed relatives can be introduced by the uninflected relative marker *co* (1b). Although this relativization strategy is limited to spoken language, relatives with uninflected *co* are considered fully grammatical (Buttler, Kurkowska, and Stakiewicz 1971). Generally, in non-standard Polish the uninflected relative marker *co* can occur in the same context as the relative pronoun *który*, but it cannot be used to replace the relative pronouns *jaki* (with non-restrictive reading), *kto*, or *co* as demonstrated in (3) (Mykowiecka 2001: 149–51). Just like *który*-relatives, *co*-relatives can modify nominals in any structural position—subjects, direct or indirect objects, etc. Note that the relative marker *co* in headed relatives requires a resumptive pronoun to mark the relativization site, except in some contexts in which the pronoun is either impossible or omissible (see section 3.2.).

(3) a.   *nikt,   **co**   o   nim   pisałem
            nobody$_{SG.N}$ that   about   him$_{SG.N.INST}$ wrote$_{1SG.M}$

     a'.   nikt,   o   kim   pisałem
            nobody$_{SG.N}$ about   who$_{SG.N.INST}$ wrote$_{1SG.M}$

     b.   *coś,   **co**   nim   pisałem
            something$_{SG.N}$ that   it$_{SG.N.INST}$ wrote$_{1SG.M}$

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[2] Throughout the rest of the paper, the pronoun will be glossed only for Case whereas its gender and number features are assumed to be the same as the ones of the RC head.

(3) b'. coś,   czym   pisałem
          something$_{SG.N}$ what$_{SG.N.INST}$ wrote$_{1SG.M}$

Traditional grammars of Polish, such as Łoś (1910: 50), consider *co* a relative pronoun referring mainly to a subject or otherwise requiring a resumptive pronoun to carry proper case. However, even though the form of the uninflected relative marker *co* is homophonous with the nom./acc. form of the relative pronoun *co*, the evidence points to its complementizer status. Cross-linguistically, homophony between *wh*-pronouns and complementizers is common, since the former are often a source for the development of the latter (Citko 2004: 108). According to Minlos (2012), the main diachronic source of this invariable lexeme in Slavic relative constructions was an inflected pronoun functioning as an interrogative, an indefinite, or a relative pronoun. This lexeme stems from Common Slavic *čьto (Russian *čto*, Bosnian/Croatian/Serbian [BCS] *što*) or *čьso (Czech, Polish *co*, Slovak *čo*).

2. Structural Asymmetries between *co*- and *który*-Relatives

Który- and *co*-relative clauses are introduced by two different types of relative markers, a relative pronoun and an uninflected lexeme/complementizer, which may result in two different derivations. This asymmetry has been extensively discussed in Szczegielniak 2006 for Polish and Russian. In his analysis he proposes that the head noun in *co*-relative clauses must reconstruct to a position inside the RC, whereas the head noun in *który*-relatives cannot. Some support for this claim comes from examples of idiom splitting. Because only the *co*-relative allows for reconstruction of the head noun, it can split up idiom chunks; compare (4a–b) (from Szczegielniak 2006: 377).[3] A similar observation has been made for Serbian relatives, as Mitrović (2008) notes that only *što*-relatives, not *koji*-relatives, allow an idiomatic interpretation in relativized idioms.

(4) a. $^{??}$słów,   **których**   on nie rzucał na wiatr
            words   which$_{GEN}$ he not throw on wind

     b. słów,   **co**   on   nie rzucał na wiatr
         words   that   he$_{NOM}$ not throw on wind

         'empty promises that he did not make'

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[3] Since reconstruction is necessary for idiom relativization, the appearance of a resumptive pronoun, which blocks reconstruction, makes the idiomatic reading of (i) impossible (Szczegielniak 2006: 377):

(i) $^{??}$słów,   **co**   on   **je**   nie rzucał na wiatr
        words   that   he$_{NOM}$ them$_{ACC}$ not throw on wind

Another difference between *co-* and *który*-relatives is in appositive RCs, which are analyzed as being separate from the head noun (Chierchia and McConnell-Ginet 1999). Therefore, head noun reconstruction in *co*-relatives seems to be confirmed since they do not allow an appositive reading, as demonstrated in (5) (from Szczegielniak 2006: 378):[4]

(5) a. *Maria,   **co**   Marek pocałował, poszła do domu.
        Maria$_{NOM}$ that Marek kissed   went   to   home

    b. Maria,   **którą** Marek pocałował, poszła do domu.
        Maria$_{NOM}$ who$_{ACC}$ Marek kissed   went   to   home

Although the abovementioned arguments point to obligatory reconstruction in *co*-relatives with no resumptive pronouns, suggesting movement of the head noun out of the relative (Bianchi 1999; Kayne 1994; Safir 1999), other arguments involving binding effects can be made pointing to the contrary. As pointed out in Gračanin-Yuksek 2013 for Croatian *što*-relatives,[5] also observed for Polish *co*-relatives, a possessive anaphor contained in the head noun cannot be bound by a subject in the RC (6a). The absence of reconstruction can also be seen in (6b), where the possessive pronoun in the head noun can corefer with an element in the RC but not in the matrix clause (examples from Gračanin-Yuksek 2013).[6]

(6) a. Jan$_i$ voli svakog svog$_{i/*j}$ psa   što (ga)
        Jan   loves every   REFL$_{POSS}$ dog$_{ACC}$ that him$_{ACC}$

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[4] In the presence of a resumptive pronoun, *co*-relatives allow an appositive reading, which suggests the lack of reconstruction in (i) (Szczegielniak 2006: 378):

(i) Maria, **co** **ją**   Marek pocałował, poszła do domu.
    Maria   that her$_{ACC}$ Marek kissed   went   to   home

[5] Although the Croatian relative marker *što* stems from the common BCS *što*, the facts observed in Gračanin-Yuksek 2013 and presented in (6), (7a), and (10) refer only to Croatian. However, since all of these languages share the relative marker *što*, some of the phenomena may be shared. See, for example, Mitrović 2008 on Serbian *što*-RCs, Arsenijević and Gračanin-Yuksek 2012 on patterns of agreement in BCS *što*-relatives, and van der Auwera and Kučanda 1985 for a discussion of the Serbo-Croatian relativizer *što*.

[6] According to one of the reviewers, the examples in (6), (7a), and (10) seem ungrammatical without the resumptive pronouns. However, Gračanin-Yuksek (2013) claims that the resumptive pronouns are optional in these contexts, except for (10a). This optionality follows from the Morphological Case Matching requirement (see fn. 5).

je	Iva$_j$	dovela	na	izložbu.	(Croatian)
AUX$_{3SG}$	Iva	brought	on	exhibition	

'Jan$_i$ loves every one of his$_i$ dogs that Iva brought to the exhibition.'

(6) b.

Jan$_i$	voli	svakog	njegovog$_{j/k/*i}$	psa	što	(ga)
Jan	loves	every	his	dog$_{ACC}$	that	him$_{ACC}$

je	Vid$_j$	doveo	na	izložbu.	(Croatian)
AUX$_{3SG}$	Vid	brought	on	exhibition	

'Jan$_i$ loves every one of his$_{j/k/*i}$ dogs that Vid$_j$ brought to the exhibition.'

Condition C effects are not observed in Croatian, as in example (7a), in which the name contained in the head noun can corefer with the pronoun in the RC. In Polish, speakers differ on whether they report sentences like (7b) to be grammatical or not (Szczegielniak 2006: 378, fn. 4).

(7) a.

Jan	poštuje	one	Vidove$_i$	odluke	što
Jan	respects	those$_{ACC}$	Vid$_{ACC.POSS}$	decisions$_{ACC}$	that

(ih)	on$_i$	provodi.	(Croatian)
them$_{ACC}$	he	enforces	

'Jan respects those of Vid's$_i$ decisions that he$_i$ enforces.'

b.

Znam	koleżankę	Janka$_i$,	**co**	on$_i$	powiedział,
know	friend$_{ACC}$	Jan's$_{GEN}$	that	he$_{NOM}$	said

że	chce	(ją)	polubić.	(Polish)
that	wants	her$_{ACC}$	like	

'I know a friend of Jan's that he said that he wants to like.'

The evidence provided against the reconstruction of the head noun inside the relative points to a matching analysis of *co*-relatives, which assumes that they contain both an external head to which the relative is adjoined and an internal one merged in the position of relativization (Bhatt 2002; Hulsey and Sauerland 2006; Sauerland 2002). After movement of the internal head to SpecCP of the RC, it undergoes deletion under identity with the external head (by a process called relative deletion; Sauerland 2002). This approach can be further supported by case mismatches occurring between the external and internal head nouns, which are described in the next section.

3. Case Mismatches between the External and Internal Head Noun in Polish *co-* and *który-*Relatives

Polish *który*-relatives show a mismatch between Cases assigned to the external and internal heads, regardless of the position occupied by the two heads, as can be seen in (8). The head noun *tę kobietę* 'this woman' is assigned acc. Case in the matrix clause, being a direct object of the verb *spotkałem* 'I met', whereas the relative pronoun in the embedded clause bears nom. Case, since it occupies the subject position of the RC. However, under a matching analysis that assumes the presence of both the internal and external head, the requirements of the matrix and embedded clause probes can be satisfied.

(8)　Spotkałem　tę　　　　kobietę,　**która**　　przyszła　do　ciebie
　　　met　　　　this$_{ACC}$　woman$_{ACC}$　who$_{NOM}$　came　　　to　you

　　　wczoraj.
　　　yesterday

　　　'I met the woman who came to you yesterday.'

　　　Unlike *który*-relatives, in which the relativization site is always a gap, *co*-relatives can either use a bare strategy or a resumption strategy. Whereas the relative pronoun *który* is marked for case by the predicate of the RC, the form of *co*, which is an invariable complementizer, cannot reflect case marking. Instead, the relativization site can be occupied by a resumptive pronoun which is marked for case. Such RCs are analyzed as being derived via external merge of the resumptive pronoun, which is bound by a null operator merged in SpecCP (Lavine 2003; Merchant 2004). However, this analysis does not account for certain cases in which the resumptive pronoun is not present. Generally, the resumptive pronoun is obligatory whenever the head noun is the direct or indirect object, whereas it is impossible with subject head nouns, as in (9):

(9)　a.　mężczyzna,　**co**　　**(*on)**　　biegnie
　　　　　man$_{NOM}$　　that　　he$_{NOM}$　　runs

　　　　　'the man that is running'

　　b.　mężczyzna,　**co**　　***(go)**　　Jan　widzi
　　　　　man$_{NOM}$　　that　　him$_{ACC}$　Jan　sees

　　　　　'the man that John sees'

　　c.　mężczyzna,　**co**　　***(mu)**　　Jan　pokazuje　książkę
　　　　　man$_{NOM}$　　that　　him$_{DAT}$　Jan　shows　　　book

　　　　　'the man that John is showing the book to'

However, it appears that the resumptive pronoun can be omitted in a broader set of contexts, as has been observed for Croatian *što*-relatives (Gračanin-Yuksek 2013: 29; this phenomenon is also discussed in Mitrović 2008 for Serbian). In (10a), the obligatory resumptive pronoun *ga* 'him' is marked for acc. Case within the RC, whereas the subject is marked for nom., assigned by T^0 of the main clause. In (10b), in contrast, both the resumptive pronoun and the relativized object are marked for acc. by the predicates of the embedded and the main clause, respectively. As a result, the pronoun can be absent, which is confirmed by the grammaticality of (10b):

(10) a. Čovjek   [što   sam   ***(ga)**   vidio] voli   Ivu.
          man$_{NOM}$ that AUX$_{1SG}$ him$_{ACC}$ seen   loves   Iva

          'The man that I saw loves Iva.'

      b. Upoznao   sam   čovjeka   [što   (ga)   Iva   obožava].
          met   AUX$_{1SG}$ man$_{ACC}$ that him$_{ACC}$ Iva   adores

          'I met the man that Iva adores.'

Furthermore, it appears that when the relativized object has a syncretic nom./acc. form, the resumptive pronoun marked for acc. case is also optional, as can be seen in (11). The Croatian examples in (10) and (11a) are taken from Gračanin-Yuksek 2013. However, a similar observation could be made for parallel Polish examples, such as (11b).

(11) a. Dijete   [što   sam   **(ga)**   vidio] voli   Ivu.
          child$_{NOM}$ that AUX$_{1SG}$ him$_{ACC}$ saw   loves   Iva

          'The child that I saw loves Iva.'

      b. Pióro   [**co**   **(je)**   zostawiłeś   wczoraj]   leży   na   stole.
          pen$_{NOM}$ that   it$_{ACC}$ left   yesterday lies   on   table

          'The pen that you left yesterday is lying on the table.'

The sentences in (11), as opposed to the examples in (10a–b), involve the neuter subjects *dijete* 'child' and *pióro* 'pen', the forms of which are ambiguous between nom. and acc. If these nouns were assigned Case by the predicates of the RCs, they would appear in the same forms. This fact makes it possible to realize the relativization sites as gaps. Therefore it is not the formal identity of Case assigned by the main and the embedded predicate that makes the resumptive pronoun optional, but the morphological form of the head noun.[7]

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[7] This correlation is formalized as the Morphological Case Matching requirement in Gračanin-Yuksek 2013: 30, as follows:

It appears then that case marking on both the external and internal head may be the key issue in the analysis of resumption strategies within *co*-relatives.

4. Agreement Patterns in Polish RCs: Subject Relativization

The abovementioned case issues also influence subject-verb agreement within Polish RCs headed by numerically quantified nominals, which appear in the main-clause subject position. Thus the following sections constitute a discussion of these patterns found in the two types of subject relatives in question, *co*- and *który*-relatives.

4.1. *Który*-relatives

An additional piece of evidence that could shed some light on the derivation of *co*- and *który*-relative clauses in Polish comes from agreement patterns when these clauses are headed by non-nominals or nominals marked for cases other than nom. In particular, numeral phrases are considered, in which the noun is modified by a higher numeral, or a lower virile numeral, and is assigned genitive Case. Such numeral phrases do not induce subject-verb agreement in main clauses, as can be seen in (12), in which the verb obligatorily appears in 3sg. neut.

(12) Siedmiu   mężczyzn   weszło/   *weszli   do   domu.
     seven$_{ACC}$ men$_{GEN.VIR}$ entered$_{3SG.N}$/ entered$_{3PL.VIR}$ into house
     'Seven men entered the house.'

    The Genitive of Quantification (GoQ) phenomenon has been extensively described in Bošković 2006, Franks 1994, Przepiórkowski 2004, Rutkowski 2002, and Willim 2003, to name but a few. The analysis of Polish GoQ structures proposed in Witkoś and Dziubała-Szrejbrowska 2015 follows the idea that probing for phi-features is possible for T only when nom. case is being checked (Boškovic 2006). Furthermore, they assume that high numerals in Polish are either acc. or caseless, which prevents T from probing for phi-features whenever they modify subject nominals. As a result, T defaults to 3sg. neut. However, when the numeral subject is relativized, the relativization site also being the subject position, agreement with the verbal predicate inside the relative can be either default (3sg. neut.) or full agreement (in person, number,

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  (i) **Morphological Case Matching**

      In a *što*-RC, an RP may be omitted if the head of the RC bears the same morphological case that it would bear if it were case marked by the element that case-marks the RP.

and gender) with the nominal subject. These two agreement options, however, depend on the grammatical gender of the head noun in combination with the RC type. Let us now consider instances in which two different patterns emerge within the *który*-relatives. The case paradigm of *który*- and *co*-relative markers is presented in Table 1.

Table 1. Case inflection on *który*- and *co*-relative markers; plural gender distinction: virile (masculine personal) and nonvirile (masculine nonpersonal, feminine, neuter)

	KTÓRY					CO
	Singular			Plural		
Case	Masc.	Fem.	Neut.	Virile	Nonvirile	
Nom./Voc.	który	która	które	**którzy**	**które**	**CO**
Accusative	którego	którą	które	**których**	**które**	**CO**
Genitive	którego	której	którego	których		CZEGO
Dative	któremu	której	któremu	którym		CZEMU
Locative	którym	której	którym	których		CZYM
Instrumental	którym	którą	którym	którymi		CZYM

Since plural nominals in Polish only distinguish virile (masculine personal) and nonvirile (masculine nonpersonal, feminine, neuter) gender, two kinds of head nouns are to be considered. First, let us look at a virile subject modified by a higher numeral, as in (13). The numeral induces the genitive form of the noun *mężczyzna* 'man', thus forcing the verbal predicate of the main clause *okradło* 'stole' to show default agreement. However, despite also being the underlying subject of the RC, the same GoQ triggers full agreement with the predicate inside the relative, *weszli* 'entered', making default agreement ungrammatical. Importantly, the relative pronoun *którzy* shares number and gender features with the noun *mężczyzna* 'man', but these two appear in different case forms.

(13) Siedmiu   mężczyzn, **którzy** weszli/   *weszło   do
      seven$_{ACC}$ men$_{GEN.VIR}$ who$_{NOM}$ entered$_{3PL.VIR}$/ entered$_{3SG.NEUT}$ into

      domu,   okradło   nas.
      house   robbed$_{3SG.N}$ us

      'Seven men who entered the house robbed us.'

A surprising contrast shows up when the subject is a nonvirile noun like *kobieta* 'woman' in (14b). In this case, the numeral also induces genitive marking on the noun it modifies, the relative pronoun *które* shares number and

gender features with it, and the case mismatch appears between the genitive noun and the nominative relative pronoun, the form of which is syncretic for nom./acc.[8] However, the predicate of the embedded clause can reflect either default or full agreement. The main clause predicate shows default agreement in (14b) as expected. Compare this to (14a), in which the nonvirile subject modified by a higher numeral forces default agreement on the main clause verbal predicate.

(14) a. Siedem   kobiet   weszło/   *weszły
             seven$_{ACC}$ women$_{GEN.NON\text{-}VIR}$ entered$_{3SG.N}$/ entered$_{3PL.NON\text{-}VIR}$

             do   domu.
             into house

      b. Siedem   kobiet,   **które**   weszły/
             seven$_{ACC}$ women$_{GEN.NON\text{-}VIR}$ who$_{NOM/ACC}$ entered$_{3PL.NON\text{-}VIR}$/

             weszło   do   domu, okradło   nas.
             entered$_{3SG.N}$ into house robbed$_{3SG.N}$ us

             'Seven women who entered the house robbed us.'

    Native-speaker acceptability judgments elicited in a questionnaire confirm the possibility of having both default and full agreement with numerically modified nonvirile subjects. These ratings were given by 114 Polish native speakers (M$_{age}$ = 22.60, SD = 2.83), out of whom 110 were students or graduates of higher education institutions (including universities in Warsaw, Poznań, Gdańsk, Gdynia, Sopot, Łódź, and Lublin). The questionnaire included 120 items, half of which were filler sentences. The sentences were divided into two surveys, each using a seven-point Likert scale and each containing the same number of relevant RC types. The results provided in Figure 1, opposite, indicate that both default agreement (M = 3.63, SE = .18) and full agreement (M = 4.81, SE = .24) are acceptable, with a preference for the latter.

    Comparing the two cases of *który*-relatives, it appears that the difference between them could be attributed to the gender feature of the head noun, namely, virile and nonvirile. However, this feature does not influence verbal agreement in main clauses, where both virile and nonvirile quantified subjects force default agreement. Apart from gender, there is yet one more difference between the two relative pronouns *którzy*$_{NOM.VIR}$, as in (13), and *które*$_{NOM/ACC.NON\text{-}VIR}$, as in (14), namely the nonvirile pronoun is a syncretic nom./acc. form, as opposed to the virile pronoun, which is exclusively nom.

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[8] Whenever the gloss regarding case marking includes more than one case, it indicates syncretism of case forms. However, it should be made clear that despite the nom./acc. syncretism of the nonvirile relative pronoun *które*, it is marked for nominative case and not accusative in the relative clause.
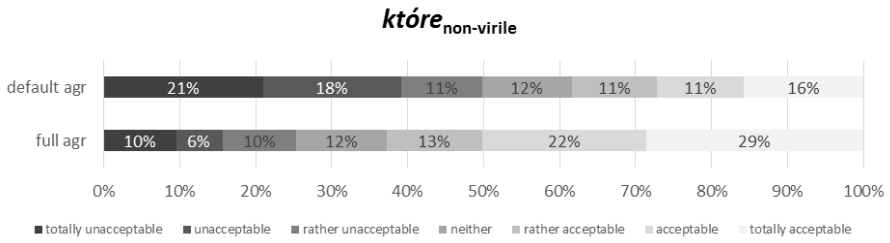
które_{non-virile}

Figure 1. Acceptability judgments for *który*-relatives with nonvirile head nouns modified by a higher numeral: default vs. full agreement

In order to examine case agreement between the relative pronoun and the numeral phrase, it is possible to use it as an interrogative pronoun in *wh*-questions. As can be seen in (15), the pronoun agrees in phi-features and case with the subject noun. Example (16) shows that the case form of the pronoun must be compatible with the case form of the higher numeral.

(15) a. **Którzy**   mężczyźni   przyszli   wczoraj?
          which$_{NOM}$ men$_{NOM}$ came$_{3PL.VIR}$ yesterday

      b. **Które**   kobiety   przyszły   wczoraj?
          which$_{NOM}$ women$_{NOM}$ came$_{3PL.NON-VIR}$ yesterday

(16) a. **Których/**   ***którzy**   pięciu   mężczyzn   przyszło
          which$_{ACC/GEN}$/   which$_{NOM}$ five$_{ACC}$ men$_{GEN}$ came$_{3SG.N}$

          wczoraj?
          yesterday

      b. **Których/**   **które**   pięć   kobiet   przyszło
          which$_{GEN}$/   which$_{NOM/ACC}$ five$_{ACC}$ women$_{GEN}$ came$_{3SG.N}$

          wczoraj?
          yesterday

Since the nominal is modified by the numeral, the nom. form of the virile *wh*-pronoun is incompatible with the numeral phrase, and instead the acc./gen. form is used (16a). In the case of the nonvirile *wh*-pronoun, both nom./acc. and genitive forms are grammatical in (16b). A similar observation has been made in Dziubała-Szrejbrowska (2014) with regard to demonstratives preceding numeral phrases, shown in (17):

(17) a. ***ci/**   tych   pięciu   mężczyzn
          this$_{NOM}$/   this$_{ACC/GEN}$ five   men

(17)　b.　te/　　　　　　tych　　pięć　kobiet
　　　　　　this$_{NOM/ACC}$/ this$_{GEN}$ five　women

Likewise, the demonstrative pronoun modifying a virile numeral phrase cannot appear in its nom. form, whereas the nonvirile one can be marked for either nom./acc. or gen. According to Dziubała-Szrejbrowska (2014: 171), this effect is due to the acc.-nom. syncretism which is uniformly found among nonvirile demonstratives and higher numerals, as demonstrated in Table 2, which also includes the *który* relative pronoun.[9] In fact, most Polish pronouns, including possessive, demonstrative, interrogative, relative, indefinite, negative, and universal pronouns, show the same pattern with respect to syncretism. That is, nonvirile pronouns have syncretic nom.-acc. forms, whereas virile pronouns show syncretism in acc.-gen. forms. Moreover, whenever they modify a numeral phrase, only the acc./gen. form of a virile pronoun can be used, while nonvirile pronouns in nom./acc./gen. are all compatible with higher numeral phrases.

Table 2. Case syncretism: higher numerals,
demonstratives, and *który* relative pronoun

Case	Higher numeral		*Który* (plural)		Demonstrative	
	Virile	Nonvirile	Virile	Nonvirile	Virile	Nonvir.
NOM	pięciu	pięć	którzy	które	ci	te
ACC						
GEN		pięciu	których	których	tych	tych

Due to the fact that default agreement within the relative is possible only when the case form of the relative pronoun is compatible with the acc. higher numeral, as in the case of the nonvirile pronoun *które*, it would seem reasonable to entertain the idea that the same pattern could occur when the acc./gen. form of the virile pronoun is used, which would be compatible with the numeral as well. In fact, such an example is mentioned by Skwarski (2010), who

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[9] Assuming that a higher numeral in Polish is acc. (Schenker 1971; Franks 1994, 2002; Przepiórkowski 1999, 2004; Miechowicz-Mathiasen 2012; Rutkowski 2002; Witkoś and Dziubała-Szrejbrowska 2015), the explanation for why a nom. form of the virile pronoun modifying a higher numeral is impossible could be that such pronouns have to agree in case marking with a numeral. Thus, in line with the nanosyntactic account proposed in Witkoś and Dziubała-Szrejbrowska 2015, the numeral moves together with the pronoun to SpecAcc position where both are realized as acc. Since the scope of this paper does not allow for a detailed account, I refer the reader to the abovementioned works.

claims that in fast speech, it is occasionally possible to produce sentences like (18) below, which are ungrammatical in standard Polish:

(18) $^{(?)}$… niż   tych   trzech   **których**   wydało   opinię.
      than   these three   who$_{ACC/GEN}$ published$_{3SG.N}$ opinion

'… than these three who had published the opinion.' (from an interview with a politician)

In this example default agreement on the verb with the relative pronoun overtly marked for acc./gen. is the only possible option. However, acceptability judgments elicited in the questionnaire mentioned at the beginning of this section show that examples like the ones in (19) are mostly unacceptable.[10] Interestingly, while the genitive form of the nonvirile relative pronoun is equally compatible with the numeral as far as case forms are concerned, nonvirile relatives were graded as even less acceptable (M = 2.17, SE = .09) than their virile counterparts (M = 2.47, SE = .10), although the forms are identical. The results are presented in Figure 2 on page 126.

(19) a. *Siedmiu   mężczyzn,   **których**   weszło   do   domu,
           seven$_{ACC}$ men$_{GEN.VIR}$ who$_{ACC/GEN}$ entered$_{3SG.N}$ into   house

           okradło   nas.
           robbed$_{3SG.N}$ us

      b. *Siedem   kobiet,   **których** weszło   do
           seven$_{ACC}$ women$_{GEN.NON-VIR}$ who$_{GEN}$ entered$_{3SG.N}$ into

           domu,   okradło   nas.
           house   robbed$_{3SG.N}$ us

Summing up, the results demonstrate that default agreement with the RC predicate is possible only when the subject is a nonvirile noun modified by a higher numeral, in which case, however, full agreement is preferred. As for virile subjects, only full agreement is possible in standard Polish.

4.2. *Co*-relatives

As opposed to the relative pronoun *który*, the invariable relative marker *co* does not share number and gender features with the subject nominal, nor does it inflect for case. The type of *co*-relative considered in this section involves subject relativization, where there is no resumptive pronoun and the relativization site is realized as a gap. As for *co*-relatives, acceptability judgments

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[10] Since such sentences are limited to nonstandard, spoken Polish, the ratings elicited in a questionnaire may be overly low due to its written form.
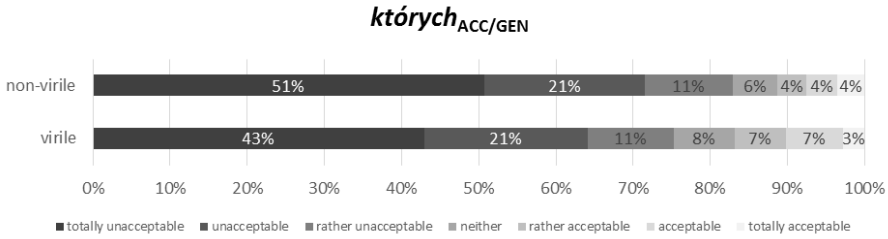
którychACC/GEN

Figure 2. Acceptability judgments for *który*-relatives in
which the relative pronoun appears in acc./gen. case
form: nonvirile vs. virile head nouns

indicate that both default and full agreement are almost equally possible, with
a slight preference for the latter in the case of virile subjects, as in (20), and as
seen in Figure 3, opposite (default: M = 3.13, SE = .08; full agreement: M = 2.83,
SE = .13), and an even more noticeable preference for full agreement in the case
of nonvirile subjects, as in (21), and as seen in Figure 4, opposite (default: M =
2.74, SE = .15; full agreement: M = 3.10, SE = .11).[11]

(20) Siedmiu   mężczyzn,   **co**   weszli/   weszło   do
      seven$_{ACC}$ men$_{GEN.VIR}$ COMP   entered$_{3PL.VIR}$/ entered$_{3SG.N}$ into

      domu,   okradło   nas.
      house   robbed$_{3SG.N}$ us

(21) Siedem   kobiet,   **co**   weszły/   weszło   do
      seven$_{ACC}$ women$_{GEN}$ COMP   entered$_{3PL.NON-VIR}$/ entered$_{3SG.N}$ into

      domu,   okradło   nas.
      house   robbed$_{3SG.N}$ us

Due to speaker variation on the acceptability of *co*-relatives, it is necessary
to look separately at the individual responses of participants who accept *co*-rel-
atives in general. Therefore, responses were selected where the mean rate for
co-relatives was more than 4 (n = 21, which constitutes 18% of all responses).
The results presented in Figure 5, opposite, clearly show that both agreement
patterns are acceptable in *co*-relatives with virile and nonvirile head nouns
(default agreement: M = 4.52, SE = .16; full agreement: M = 4.61, SD = .17).

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[11] It is important to note that the use of invariable *co* as a relative marker is not the pri-
mary relativization strategy in Polish and may be considered totally unacceptable by
some speakers, which can be seen in the results of the questionnaire shown in Figures
3–4. Furthermore this strategy is also limited to spoken language, which may have
influenced the judgments of written sentences used in the questionnaire.
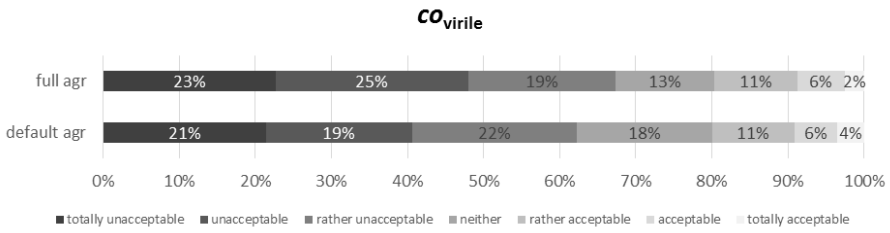
covirile

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
full agr		23%		25%		19%		13%	11%	6%	2%
default agr	21%		19%		22%		18%		11%	6%	4%

■ totally unacceptable   ■ unacceptable   ■ rather unacceptable   ■ neither   ■ rather acceptable   ■ acceptable   ■ totally acceptable

Figure 3. Acceptability judgments for *co*-relatives with virile head nouns modified by a higher numeral: full vs. default agreement

conon-virile

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
full agr	22%		21%		21%		17%		7%	8%	4%
default agr	32%		21%		14%		15%		11%	5%	2%

■ totally unacceptable   ■ unacceptable   ■ rather unacceptable   ■ neither   ■ rather acceptable   ■ acceptable   ■ totally acceptable
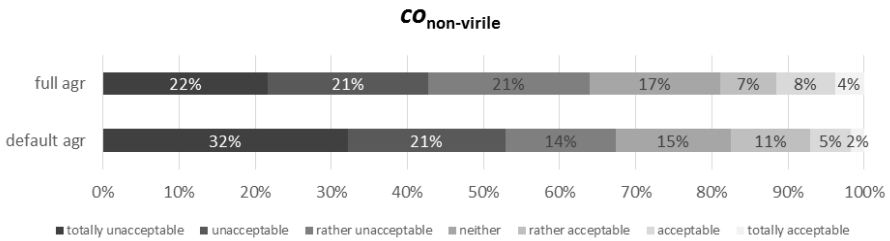
Figure 4. Acceptability judgments for *co*-relatives with nonvirile head nouns modified by a higher numeral: full vs. default agreement

co-positive responses

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
default agr	3%	6%	10%	28%		32%		14%		8%	
full agr	4%	3%	16%	23%		23%		23%		9%	

■ totally unacceptable   ■ unacceptable   ■ rather unacceptable   ■ neither   ■ rather acceptable   ■ acceptable   ■ totally acceptable
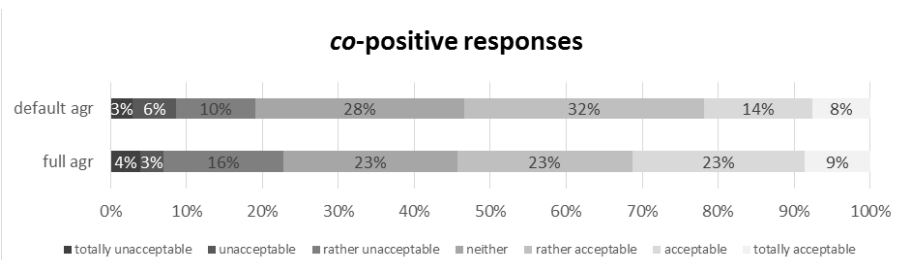
Figure 5. Acceptability judgments of participants who accept *co*-relatives in general: full vs. default agreement

As for the statistical results, a 3 × 2 (type of RC × agreement) one-way ANOVA test showed a significant main effect of the type of Polish RCs: *który*-relatives (Figure 1), *który*-relatives in which the relative pronoun was marked for acc./gen. (Figure 2), and *co*-relatives (Figures 3–4), ($F[2.60] = 92.222$, $p = .000$), with *który*-RCs (M = 4.22, SD = .88)—differing significantly from *których*$_{ACC/GEN}$ RCs (M = 2.32, SD = .32) and *co*-RCs (M = 2.95, SD = .29; $p = .000$).

Furthermore, post hoc comparisons that were Bonferroni-corrected also revealed that there is a statistical difference between default and full agreement in *który*-relatives (full: M = 4.81, SD = .75; default: M = 3.63, SD = .56, *F*[1,60] = 34.296, *p* = 0.000), but not in *co*-relatives (full: M = 2.99, SD = .28; default: M = 2.91, SD = .31, *F*[1.60] = .168, *p* = .683).[12]

Since in both *co-* and *który*-relatives (with nonvirile head nouns) either default or full agreement pattern is possible, the matching analysis appears most plausible. As in the movement analysis, the numeral phrase along with the relative pronoun in the case of *który*-relatives would be generated in the subject position of the relative and would force default agreement on the verb and acc. marking on the relative pronoun *który*, contrary to what we observe. Nevertheless, assuming them to be derived via a matching analysis, there is a need for some mechanism that would allow the acc. Case feature of the external head to be optionally transmitted to the operator within the RC, which otherwise bears nom. Case checked in the SpecTP position. Since default agreement is caused by the lack of nom. on the subject, Case-feature sharing between the external head and the relative operator (the pronoun *który* or the null operator in *co*-relatives) could provide a plausible account for the agreement patterns described in this paper.

4.3. Optionality in Agreement: Case Attraction

A possible explanation for the subject-verb agreement patterns could be Case attraction, by which the relative operator appears with the case morphology of the external head rather than the Case governed by the internal Case probe of the RC. It is attested in a number of languages, such as Old and Middle High German (Pittner 1995) and modern German (Bader and Bayer 2006). According to Bader and Bayer (2006), the head NP and the relative operator share number and person features, but feature sharing is erroneously extended to Case features, resulting in Case-attraction effects. This mechanism is generally optional and is only possible when the matrix Case probe is more oblique than the Case probe of the relative, in line with the following Case hierarchy from Pittner (1995: 200–01; see also Grosu 1994: 122): GEN > DAT > ACC > NOM (Salzmann and Georgi 2014: 349). Let us first consider the derivation of Polish RCs along the lines of a Case-attraction analysis.

Który-relatives: in both (22) and (23) the relative pronoun undergoes Agree with the T probe, checking structural nom. Case, and then moves to SpecCP. Next, the external GoQ head is Merged, bearing acc. Case, which blocks an

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[12] The statistical difference between full and default agreement in *który*-RCs with nonvirile head nouns indicates that there is a strong preference for the former agreement pattern. However, default agreement is also possible in this type of RC, as opposed to *który*-RCs with virile head nouns, which do not allow for default agreement.

Agree relation with the matrix T probe, further resulting in default agreement on the matrix verbal predicate. At some point, the GoQ head enters into some sort of agreement relation (or feature sharing per Bader and Bayer 2006) with the relative pronoun, checking phi-features. However, the acc. Case feature of the head noun is optionally transmitted onto the nonvirile relative pronoun, as shown in (23).

(22) siedmiu mężczyzn, **którzy** weszli do domu
seven$_{ACC}$ men$_{GEN}$ **who$_{NOM}$** entered$_{3PL.VIR}$ into house

siedmiu mężczyzn [$_{CP}$ **którzy**$_{NOM}$ <siedmiu mężczyzn> C [$_{TP}$ T [$_{vP}$ t$_{którzy<siedmiu mężczyzn>}$ ···]]]

└── Agree$^{??}$+ACC ──┘ └──────────────────┘ NOM ──┘

(23) siedem kobiet, **które** weszły/ weszło
seven$_{ACC}$ women$_{GEN}$ who$_{NOM/ACC}$ entered$_{3PL.NON-VIR}$/ entered$_{3SG.N}$
do domu
into house

siedem kobiet [$_{CP}$ **które**$_{NOM/ACC}$ <siedem kobiet> C [$_{TP}$ T [$_{vP}$ t$_{które<siedem kobiet>}$ ···]]]
└── Agree$^{??}$+ACC ──┘ └──────────────┘ NOM ──┘

One of the possible mechanisms for this Case enrichment could be Case stacking (Vogel 2001),[13] whereby whenever Case attraction is possible and the Case of the external head noun is stacked on the relative pronoun, the second Case is realized, that is, acc. Notice that this application of Case stacking complies with the Case hierarchy of Pittner (1995). However, the question arises as to what prevents the virile relative pronoun from undergoing Case attraction. It appears that the morphological case form of the relative pronoun determines the accessibility of Case attraction in Polish. Whereas the nonvirile pronoun has a syncretic nom./acc. form, the nom. form of the virile pronoun is not syncretic, being incompatible with the relativized numeral phrase, as seen in (16). In fact, the mechanism of inverse (Case) attraction adapted for Croatian *što*-relatives in Gračanin-Yuksek 2013 is also based on morphological case forms, as opposed to abstract Case features. Thus it is the matching of morphological case forms of the internal and external heads, and not abstract Case checked by them, that enables the dropping of the resumptive pronoun within *što*-relatives (see section 3.2.). Likewise, syncretism of case forms can rescue the derivation of Polish free relatives (Assmann 2014). As can be seen

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[13] One of the problems with the Case-stacking analysis is, however, that it is not clear how the relative pronoun can still be active to undergo any Case agreement relation with the external head after being Case checked with the probe within the RC (Salzmann and Georgi 2014: 352).

in (24a–b), Polish free relatives require strict case matching. Nevertheless, when the morphological form of the relative pronoun is syncretic, matching the Case feature of both probes, the sentence is grammatical (24c) (Assmann 2014: 3).

(24)   a.   Jan   lubi   **kogokolwiek**   Maria   lubi.
           Jan   likes$_{ACC}$ whoever$_{ACC}$ Maria   likes$_{ACC}$

      b.   Jan   ufa   ***komukolwiek/*kogokolwiek** wpuścił do domu.
           Jan   trusts$_{DAT}$ whoever$_{DAT}$/   whoever$_{ACC}$ let$_{ACC}$ to home

           'John trusts whoever he let into the house.'

      c.   Jan   unika   **kogokolwiek**   wczoraj   obraził.
           Jan   avoids$_{GEN}$ whoever$_{ACC/GEN}$ yesterday   offended$_{ACC}$

           'Jan avoids whoever he offended yesterday.'

A similar observation has been made for across-the-board (ATB) dependencies in RCs (Dyła 1984 for Polish following Borsley 1983; Franks 1995). As shown in (25a), a conjunction of two phrases containing verbal predicates with different case requirements is ungrammatical since neither of the two pronoun forms, acc. or gen., can satisfy these requirements on its own. However, as can be seen in (25b), when the morphological case form of the virile relative pronoun is syncretic for acc. and gen., the pronoun complies with the requirements of both *lubi* 'likes' and *nienawidzi* 'hates' (the examples in (25) are taken from Franks 1995: 61). Therefore, Dyła (1984) assumes that morphological case identity is crucial in licensing ATB dependencies in RCs.[14] The same seems to hold not only for free relatives but also for parasitic gaps (Franks 1995: 87, fn. 4). Therefore, the ATB RC structures are yet another example where morphological case form plays a role in licensing.

(25)   a.   *dziewczyna,   którą/   której   Janek   lubi   *e*   a
           girl   who$_{ACC}$/ who$_{GEN}$ Janek   likes   and

           Jerzy   nienawidzi   *e*
           Jerzy   hates

           'the girl who Janek likes and Jerzy hates.'

---

[14]   However, this condition alone is not enough to account for all the licit ATB constructions. Thus Dyła (1984) argues that apart from morphological syncretism, abstract Case identity is also necessary in licensing these constructions. Likewise, Williams (1978) and Franks (1995) posit some sort of parallelism constraints on ATB structures, such as the need for the dependencies to be both either leftmost or not leftmost, or the parallelism of thematic prominence, respectively. Some analyses moreover stipulate structural conditions on ATB constructions (Gazdar, 1981; Pesetsky 1982; Goodall 1983, 1987; Woolford 1987).

(25) b. chłopiec,   którego   Maria   lubi   *e*   a   Ewa
         boy   who$_{ACC}$/$_{GEN}$ Maria   likes   and   Ewa

     nienawidzi   *e*
     hates

     'the boy who Maria likes and Ewa hates'

Therefore, a conclusion could be drawn that Case attraction in Polish *który*-relatives is possible only if the morphological form of the relative pronoun is compatible with case marking on the external head noun, which in this case is marked for acc.

    Co-relatives: In Polish subject *co*-relatives, the relativization site is a gap due to the lack of subject resumption. Thus, assuming a matching analysis, the null operator Agrees with T and then moves to SpecCP. Since it does not have any morphological form, the relative operator for both virile and nonvirile head nouns can undergo Case attraction.

(26) siedmiu   mężczyzn,   **co**   weszli/   weszło   do   domu
       seven$_{ACC}$ men$_{GEN}$ comp   entered$_{3PL.VIR}$/entered$_{3SG.N}$ into   house

siedmiu mężczyzn [$_{CP}$ **Op**$_{NOM}$ <s̶i̶e̶d̶m̶i̶u̶ ̶m̶ę̶ż̶c̶z̶y̶z̶n̶> **co** [$_{TP}$ T [$_{vP}$ t$_{Op-<s̶i̶e̶d̶m̶i̶u̶ ̶m̶ę̶ż̶c̶z̶y̶z̶n̶>}$

                                                            …]]]

  └─ Agree$^{??}$+ACC ──┘ └──────────────────┘ NOM ─┘

This solution, however, wrongly predicts Case attraction to be equally possible for any relativized object head noun bearing acc. or oblique Case. As a result, an object head noun bearing acc. Case could transmit it to the nom. null operator inside the relative, causing default agreement on the verbal predicate. This does not happen. In fact, the same option would be wrongly predicted to be possible for *który*-relatives with nonvirile object head nouns marked for acc. It appears then that Case attraction must be further restricted for Polish relatives if it at all constitutes the right explanation for the agreement facts discussed in this article. To prevent this mechanism from overgenerating, the requirement should be added that both the relative operator and the external head need to be probed by the same type of probe, which in this case is the internal and external T. This, alternatively, would make Case attraction undetectable in all other environments, limiting it to the situation in which the non-nom. subject of the matrix clause undergoes subject relativization. In fact, Case attraction is not otherwise observed for Polish relatives.

    Note that if the same kind of feature sharing of acc. Case were between the internal (not external) head noun and the relative pronoun/operator, default agreement should be observed for both types of RC modifying any object GoQ. This was not examined in this study but appears to be impossi-

ble. Another issue involves the point in the derivation at which subject-verb agreement is established. Since Case attraction occurs after movement of the relative operator to SpecCP, for default agreement to be possible the agreement relation needs to be established after the mechanism of Case attraction applies. This requires look-ahead and goes against the Earliness Principle (Pesetsky 1989). Yet another solution for applying a Case attraction mechanism, as suggested in Salzmann and Georgi 2014, could be to stipulate that the Case value of the relative pronoun is overwritten at PF (Pesetsky 2013; Spyropolous 2011) or that Case values in general are assigned at PF (Alexiadou and Varlokosta 2007; Bobalijk 2008; Assmann 2014; Baker 2015). As a consequence, however, default verbal agreement would also be the result of a postsyntactic operation. This and other issues could be resolved after closer examination of case-matching restrictions and resumption strategies in Polish relatives, which would constitute interesting topics for future research.

5. Conclusion

The derivation of RCs has been a rather controversial issue due to inconclusive evidence supporting either of the analyses. However, the subject-verb agreement patterns found in Polish *co*- and *który*-relatives modifying subject head nouns suggest that movement of the head noun out of the RC in Polish should not be involved in the derivation of these structures, since they both allow optionality of agreement in certain contexts. Whereas *co*-relatives allow either full or default agreement regardless of the grammatical gender of their head nouns, *który*-relatives show the same pattern only when the case form of the relative pronoun is compatible with the numeral head noun, which is the case with nonvirile nominals. Otherwise, only full agreement is possible. The asymmetry between Polish virile and nonvirile head nouns can be attributed to the acc.-nom. syncretism which is uniformly found with the nonvirile relative pronoun *który* and higher numerals. Because its morphological case form is always compatible with the numeral case form, the acc. Case feature of the external numeral phrase can be erroneously extended to the relative pronoun (or null operator), resulting in default agreement on the verbal predicate within the relative. This, however, is impossible for numeral phrases containing virile nouns due to the unambiguously nom. form of the virile relative pronoun.

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