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## THE OLD SARDINIAN QUANTIFIER *TOTTU* ‘ALL’: (LACK OF) AGREEMENT AND A ∀NUMQ-CONSTRUCTION\*

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**ABSTRACT** This article focusses on the syntax of the universal quantifier *tot(t)u* ‘all’ in Old Sardinian. A peculiar aspect of this quantifier is that agreement with the NP over which it quantifies was optional in Old Sardinian, with one striking exception: whenever *tottu* was used together with a numeral (like in English ‘all four brothers’), non-agreeing *tottu* appears to have been obligatory. The aim of the article is to provide a syntactic analysis within the Minimalist Program (Chomsky 2000 et seqq.) that can account for these facts. After an outline of the basic properties of Old Sardinian adnominal *tottu*, the broader typological state of research on combinations of universal quantifiers and numerals is discussed. In particular, it is shown that the Sardinian word order pattern is an instance of what Cirillo (2009) has called ‘universal numeric quantifiers’ (∀NumQ). The main part of the article is dedicated to the analysis of the Old Sardinian construction within Chomsky’s (2001 et seqq.) probe-and-goal framework. The main line of argumentation is that *tottu* is merged adjacent to the numeral in a low position within the DP (roughly following Corver 2010) and must be attracted to a QP above the DP. This attraction depends on a phi-probe in the Q head, so *tottu* must enter the derivation with phi-features.

### 1 INTRODUCTION

This article focuses on an aspect of the syntax of the universal quantifier *tot(t)u*<sup>1</sup> ‘all’ in Old Sardinian (< late Latin *tōttus*, a variant of *tōtus*, cf. REW 8815, DES 2:500). Note that, in Modern Sardinian, this quantifier shows a lack

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<sup>1</sup> The spelling is either *tottu* or *totu*. I will henceforth refer to it as *tottu*.



In 2019, I carried out a corpus study on Old Sardinian indefinites and quantifiers using the corpus *Archivio Testuale della Lingua Sarda delle Origini (ATLiSO)* by Giovanni Lupinu, which has been available since 2017. The results presented in [Mensching \(in press\)](#) also include a first-time quantitative analysis of the agreement behavior of Old Sardinian *tottu*. My analysis showed that agreement of adnominal *tottu* was optional in Old Sardinian, with one striking exception: whenever *tottu* was used together with a numeral (like in English *all four brothers*), non-agreeing *tottu* is not documented, that is, in these cases, *tottu* always agrees both in gender and in number in the corpus.

However, [Mensching \(in press\)](#) is a purely quantitative and descriptive overview. The aim of this article is to provide a syntactic analysis within the Minimalist Program ([Chomsky 2000](#) et seqq.) that can account for the striking fact that agreement on adnominal *tottu* was obligatory in Old Sardinian when it appears together with a numeral, whereas it was apparently optional in all other environments. In this article, I will only be concerned with adnominal *tottu*. I will not consider predicative, pronominal, and adverbial uses of *tottu*, nor will I deal with floating quantifier structures.

This article is organized as follows: In Section 2, I outline the basic facts on Old Sardinian adnominal *tottu*, mostly following [Mensching \(in press\)](#), with special attention to the combination of *tottu* with numerals, in which agreement on *tottu* appears to have been obligatory, and which shows up in the word order ‘all’+Num(+Det)+N. Section 3 discusses the broader typological state of research on combinations of universal quantifiers and numerals. In particular, I show that the Sardinian word order pattern is an instance of what [Cirillo \(2009\)](#) has called “universal numeric quantifiers” ( $\forall$ NumQ), which show adjacency of the numeral and the quantifier. I also discuss the syntactic analyses proposed by [Cirillo \(2009\)](#) and [Corver \(2010\)](#) to account for languages that have this word order. Whereas these accounts follow earlier versions of generative syntax, in Section 4, I develop an analysis of the Old Sardinian structure within [Chomsky’s \(2001](#) et seqq.) probe-and-goal framework. Section 5 briefly summarizes and discusses the results of this article, including some remarks with respect to the further diachronic development of *tottu* and its use in modern Sardinian dialects.

Before I start, let me briefly provide some basic information on Sardinian.<sup>5</sup> Sardinian is the autochthonous Romance language of Sardinia. It is usually held that, with respect to the traditional division of Romance into Western and Eastern Romance languages, Sardinian cannot be clearly attributed to ei-

<sup>5</sup> For what follows, see, among others, [Contini & Tuttle \(1982\)](#), [Jones \(1988, 1997\)](#), [Blasco Ferrer \(1995, 2000\)](#).

ther group, although it shares the sigmatic plural formation (i.e., with a final -s) with the former. Like most Romance languages, it is a null subject language with (S)VO order in Modern Sardinian, which allows VS order under certain conditions. In contrast, Old Sardinian was mostly a V1 language (cf. Wolfe 2015a,b). Nonetheless, V2, and even V3 and V4 orders are often found in texts that show Italian influence (cf. Mensching in press), which started to become particularly palpable from the 13th century onwards (Wagner 1997: 234–235). Sardinian comes in two main dialect groups: Campidanese in the South and Logudorese in the north, the latter including Central Sardinian or Nuorese, which in the literature is usually considered to be particularly conservative with respect to Latin. All modern varieties of Sardinian are in diglossia with the official language, Italian. The number of speakers is estimated to be approximately 1 million (cf. Moseley 2007).

Sardinia belonged to Byzantium in the second half of the first millennium AD but developed independent kingdoms (the so-called Judicates) in the High and Late Middle Ages. It is in this phase that Old Sardinian is documented from around 1050 to around 1400. The documentation is exclusively legal and administrative (Wagner 1997: 80–83). According to Blasco Ferrer (1995: 250–251), the documents that have come down to us can be divided into three types: (i.) letters of the chancelleries of the four Judicates, mostly containing legacies and donations; (ii.) the *condaghes*, which are proceedings of transaction concerning the property assets and housing stock of monasteries; (iii.) codifications of laws and municipal ordinances (also cf. Mensching in press). The *ATLiSO*r corpus covers all known examples of all three types of documents.

## 2 ADNOMINAL *TOTTU* IN OLD SARDINIAN

In this Section, I mostly summarize the findings of the corpus analysis that is presented in Mensching (in press). The whole *ATLiSO*r corpus contains 479 occurrences of adnominal *tottu*, whose main functions were, like today, universal plural quantification and universal quantification of singular mass, collective, and abstract nouns. Unlike modern Sardinian (see Section 1, examples (1)), the determiner following *tottu* was not obligatory in Old Sardinian, as seen in (2b) and (4b) below. Occasionally, *tottu* occurs to the right of the NP or DP, as in *fios suos tottu* ‘all his children’ (Cond. SPS 205, p. 210.17), alongside *cu(n) tottu fios suos* ‘with all her children’ (ibid., p. 210.33). As both examples are found in the same context (a long list of names of freed serfs),

there does not seem to be any semantic or pragmatic difference between the two.<sup>6</sup>

As was expected from the examples given by [Blasco Ferrer \(2003: 207\)](#) (see Section 1, in particular note 4), both agreeing and non-agreeing forms are found in the corpus:

- (2) (a) fem. sg. [+agreement]  
e llevarun **totta sa casa** issoro  
'and they took away all their property' (Cond. SPS 44, p. 118.7)
- (b) fem. sg. [-agreement]  
Parsit iustitia a **totu corona** de logu  
'It seemed just to the whole court' (Cond. SMB 104, p. 74.19)
- (3) (a) fem. pl. [+agreement]  
sas dominiguas de totu s'an(n)o et **totas sas festas** de santa  
Maria  
'the Sundays of the whole year and all the feasts of Saint Mary'  
(CdLA CXXV, p. 166.3)
- (b) fem. pl. [-agreement]  
deppiat satisfacher sa mesitate d(e) **tottu sas ispesas**  
'[he] had to cover half of all the expenses'  
(StSS L. I-XXXVII, p. 21.21)
- (4) (a) masc. pl. [+agreement]  
ad honore de Deus et de sancta Maria et de **totos sos santos**  
'to the honor of God and of Saint Mary and of all the saints'  
(Cond. SMB 33, p. 41.2)
- (b) masc. pl. [-agreement]  
*Testes: Simio d'Elices e totu bicanos suos.*  
'Witnesses: Simio d'Elices and all his neighbors'  
(Cond. SNT 1, p. 64.14)

In [Mensching \(in press\)](#), I show that the absence or presence of agreement in cases such as those in (2) to (4) does not depend on any syntactic factors, so

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<sup>6</sup> The postnominal position mostly appears when a relative clause or some restricting phrase follows. In [Mensching \(in press\)](#), I provisionally interpret these examples as structures in which the property that determines the set expressed by 'all' is spelled out right-adjacent to the quantifier. Since this is a phrasal constituent or, in generative terms, a maximal projection, it cannot be inserted in the standard head position (Q°) of a quantifier phrase and must therefore be generated in a right-peripheral position.

it seems that agreement of *tottu* was optional.<sup>7</sup> This optionality was probably an intermediate diachronic step towards the total loss of agreement that can be observed in Modern Sardinian.<sup>8</sup>

An interesting finding of Mensching (*in press*) is the fact that 22 of the 29 occurrences of the masculine plural form (*tot[t]os*) are followed by a numeral, as shown in (5):

- (5) (a) *torraitimilos iudike tottos .VI. sos fijos* de Barbara Rasa  
 ‘the judge gave back to me all six sons/children of Barbara Rasa’  
 (Cond. SPS 33, p. 108.36)
- (b) *et a Petru de Nurki et a totos .III. sos connatos comporailis su*  
*pede de Iorgi de Contra*  
 ‘and from Petru de Nurki and all his three brothers-in-law, I  
 bought a quarter of Iorgi de Contra’  
 (Cond. SNT 1, p. 107.2)
- (c) *Mandei pro-llos et benneruntimi totos tres frates* fijos de  
 Gostantine Stapu: Orçoco et Comida et Iohanne.  
 ‘I summoned them, and there came all three brothers, sons of  
 Gostantine Stapu: Orçoco, Comida, and Iohanne.’  
 (Cond. SMB 133, p. 89.9)

Conversely, non-agreeing *tottu* is not found at all whenever a numeral follows. This also turns out to be true for the feminine, of which the corpus contains only one occurrence with a numeral, showing agreement:

- (6) *Conporailis ad Ytçoccor Mavronti et assos frates, die de Pale*  
*Pirinione, et die in Istefane Pira, et .iii. dies in totas .iii. sas filias: [...]*  
 ‘I bought from Ytçoccor Mavronti and from his brothers one day of  
 Pale Pirinione, and one day of Istefane Pira, and three days of all  
 three daughters: [...].’ (Cond. SNT 1, 94.5)

<sup>7</sup> For Old Sardinian, the quantitative analysis in Mensching (*in press*) shows that, in the overwhelming majority of cases (89%), *tottu* agrees in the feminine singular, whereas it rather rarely agrees in the feminine plural (ca. 12%) and not very frequently either in the masculine plural (ca. 19%). Agreement in the feminine singular seemed to have been constantly predominant (ca. 90%–100%) until the end of the 14th century, when it suddenly drops to 50% in the latest text. The masculine plural form seems to have had at least some significant vitality between the end of the 11th and the second half of the 13th centuries and was practically inexistent in the 14th c. Together with the drop in frequency of the feminine singular form, we could interpret this as the beginning of a tendency that would ultimately lead to the modern situation without agreement.

<sup>8</sup> For a modern plural form *tottus* that is sporadically found, see note 2. This form is homonymous to Old Campidanese *tottus* mentioned in note 4 but probably has a distinct origin. For further details, see Section 5.

Thus, at least as far as we can judge from the existing documentation,<sup>9</sup> it seems that, in Old Sardinian, agreement was obligatory when *tottu* was followed by a numeral. Furthermore, the occurrences of *tottu* with a numeral, when the determiner is present,<sup>10</sup> show the word order that is found in examples (5a,b) and (6), that is, with the sequence *tottu* + numeral preceding the determiner.

### 3 UNIVERSAL QUANTIFIERS IN COMBINATION WITH NUMERALS

The word order that can be observed in the Old Sardinian examples is that in (7a) (word order A). In the modern Romance languages, other word orders are used, in particular that in (7b). This order (word order B) can be seen below in the Spanish example (8a) and the Italian example (8b). Italian, in addition to order B, also has an alternative word order that is similar to A but shows the coordinating conjunction *e* 'and' between 'all' and the numeral, as shown in (7c) and exemplified in (8c). Finally, Romanian shows a variant of word order A, 'all'+Num+N=Det, due to the fact that the definite article in Romanian is a postnominal clitic, see (8d).

- (7) (a) 'all'+Num+Det+N (henceforth word order A)  
 (b) 'all'+ Det+Num+N (henceforth word order B)  
 (c) 'all'+ 'and'+Num+Det+N (henceforth word order C)
- (8) (a) *todos los tres estudiantes*  
 all the three students  
 (Modern Spanish)
- (b) *tutti i tre studenti*  
 all the three students  
 (Modern Italian)
- (c) *tutti e tre gli studenti*  
 all and three the students  
 (Modern Italian)
- (d) *toți trei studenți=i*  
 all three students=the  
 'all three students' (Modern Romanian, cf. Cirillo 2009: 159)

<sup>9</sup> The 23 examples with a numeral make up 10.5% of the 220 plural phrases with adnominal *tottu*. Whereas *tottu* agrees in 100% of these cases, in most of the remaining 197 occurrences (92.9%), that is, those without a numeral, *tottu* remains invariable.

<sup>10</sup> Most of the 23 occurrences lack a determiner. But in the five occurrences where it shows up, it always appears in this order.

The following table (based on [Giusti 1992](#): 314–315, [Giusti 2010](#): 398–399, [Bianchi 1992](#): 60, [Balsadella 2017](#): 7, [Cirillo 2009](#): 173, and [Doetjes 1997](#): 210) shows the distribution in modern Romance languages:<sup>11</sup>

	A	B	C
French	–	+	–
Spanish	–	+	–
Catalan	–	+	–
Portuguese	–	+	–
Romanian	+	–	–
Italian	–	+	+
Sardinian	–	+	+

**Table 1** Word order of ‘all’ + numeral in several modern Romance languages

The table also shows that Modern Sardinian has lost word order A and is now in line with Italian.<sup>12</sup> Conversely, word orders B and C are not attested at all in Old Sardinian. As for other Old Romance languages, more research is needed, but I have shown in [Mensching \(in press\)](#) that word order A can be attested in Old French, Old Spanish, and Old Italian (alongside other word orders). It thus seems to have been a common Old Romance structure, which was also shared by Old Sardinian. The origin of this pattern as well as the issue of why, when, and how it got lost in almost all Romance languages, lies beyond the scope of the present article. Let me just note that, unlike Sardinian, all other Romance languages considered in [Table 1](#) (both in their medieval and in their present versions) always show full agreement on the universal quantifier, both with and without numerals.<sup>13</sup>

Word orders A, B, and C have been analyzed cross-linguistically (includ-

<sup>11</sup> According to [Doetjes \(1997: 210\)](#), French does not at all allow the combination of adnominal *tous* ‘all’ with a numeral and a determiner. I have tested this with some speakers of French and have been able to confirm that *\*tous les trois hommes* ‘all the three men’ is ungrammatical. However, an anonymous reviewer points out that this word order is acceptable with a ‘frequency’ interpretation (*tous les trois ans* ‘every three years’); also see [Cirillo \(2009: 173\)](#). The same reviewer observes that even with non-frequency interpretations, such structures seem to be fine with higher numbers (*tous les 27 pays* ‘all 27 countries’). In contrast, pronominal *tous* does not seem to follow any constraint: *tous (les) trois* ‘all three (of them)’.

<sup>12</sup> For the structures available in Modern Sardinian, see [Section 5](#).

<sup>13</sup> An anonymous reviewer suggests that French might be an exception. However, in Old French, both number and gender agreement generally occur in the adnominal uses of the quantifier discussed in this article. For some very sporadic cases of deviant agreement behavior of *tot* in Old French (mostly in non-adnominal uses) see [Beyer \(1907: 643, 646, 650, 653, 655, 658–659, 676, 682–683, 708–709\)](#). The tendency of lack of agreement in gender reported by [Bauche](#)



ing in some Romance languages) by Cirillo (2009), who considers A and C to be essentially one type and B to be another type of structure, as shown in (9):

- (9) (a) [QP all [DP the [CardP three [NP children]]]] order B  
 (b) [QP all (and) three [DP the [CardP  $\emptyset$  [NP children]]]] orders A and C

In a similar vein, Giusti (1993, 1995) had already suggested for the Italian construction in (8c) that the sequence ‘all’+‘and’+numeral forms a complex head, as it behaves exactly like the simple plural quantifier *tutti*, *-e* in Italian. According to Cirillo, in (9a), the quantifier is generated in its regular position within a quantifier phrase (QP) preceding the DP, and the cardinal number is generated in a cardinal phrase (CardP) that is a complement of the determiner (D). Instead, in (9b), the numeral is generated together with the quantifier, creating a complex quantifier head, the “universal numeric quantifier” ( $\forall$ NumQ). Note that Cirillo does not derive (9b) from (9a), because head-movement from the lower Card<sup>o</sup>-position would have to cross D<sup>o</sup> and would thus violate the head movement constraint (HMC). The structure in (9b) is, however, somewhat awkward due to the empty Card head.

Furthermore, Cirillo (2009: 160) mentions an interesting agreement pattern in Modern Dutch, see (10):

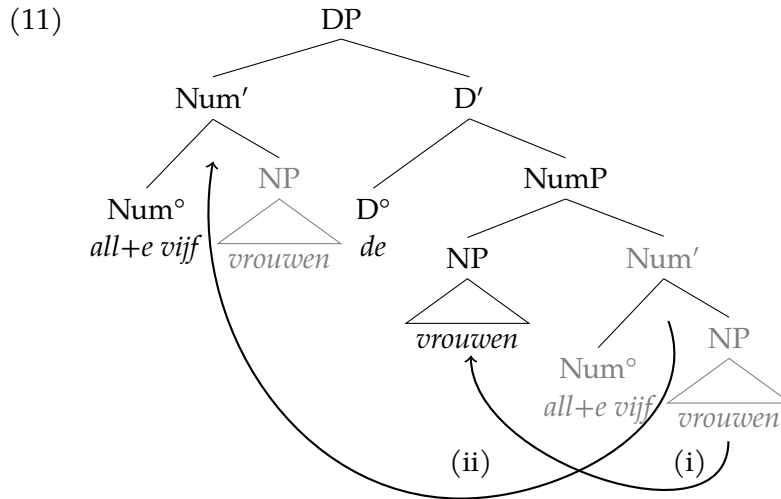
- (10) (a) *Al de drie studenten hebben het boek gelezen.*  
 all the three student-PL have the book read  
 (b) *Alle drie de studenten hebben het boek gelezen.*  
 all-PL three the student-PL have the book read  
 (Modern Dutch; Cirillo 2009: 160)

Plural agreement shows up only in (10b), that is, with word order A, or, in Cirillo’s terms, the  $\forall$ NumQ construction. For Old Sardinian, we cannot replicate the contrast in (10), as the documentation does not contain examples of the word order shown in (10a) (word order B). However, the fact that, in Dutch, agreement shows up in exactly the same structure as in Sardinian, makes us suspect that the  $\forall$ NumQ construction is somehow related to agreement.

Cirillo (2009) does not account for the agreement behavior of the Dutch examples. An attempt to explain the contrast in Dutch data similar to (10) is made by Corver (2010): In accordance with Cirillo (2009), Corver also assumes that ‘all’+numeral is generated as a complex head, but in a NumP that

(1946: 90–91) and Andersson (1954: 19) is a phenomenon that is restricted to modern sub-standard varieties of French.

has the position of Cirillo’s CardP: [<sub>NumP</sub> [<sub>Num°</sub> all five] [<sub>NP</sub> women]]. The further derivation is performed in two steps: first, the NP is raised to the specifier of NumP (step (i) in (11)), and this is where agreement is realized via specifier–head agreement. Then, the lower part of the NumP moves to the specifier of DP (step (ii)).



Although by assuming phrasal movement Corver overcomes the problem that Cirillo (2009) had (the impossibility of a movement approach due to the HMC), step (ii) is problematic because it involves movement of an X'-constituent, which should not be allowed in modern generative frameworks.<sup>14</sup> Also note that the complex head 'all'+numeral is a complex numeral in Corver's analysis (Num°), whereas Giusti's (1993, 1995) discussion of the similar Italian structure rather suggests that it is a complex quantifier. Apart from these problems, it remains to be seen how such an analysis can be reformulated in more recent Minimalist terms, as specifier–head agreement is no longer a valid operation since Chomsky (2000).

<sup>14</sup> Corver (2010: 97) also explains why some Dutch dialects also show agreement on the numeral in the construction at issue, by assuming that  $\forall$ NumQ, similarly to what can be seen overtly in the Italian example in (8c), "represents a coordinate structure: a quantifier head and a numeral head are (asyndetically) coordinated with each other [...]. In line with the general behavior of coordinate structures, a morphological property (in casu appearance of -e) is realized on both conjuncts."

## 4 A MINIMALIST ANALYSIS OF THE OLD SARDINIAN $\forall$ NUMQ CONSTRUCTION

### 4.1 Preliminary remarks

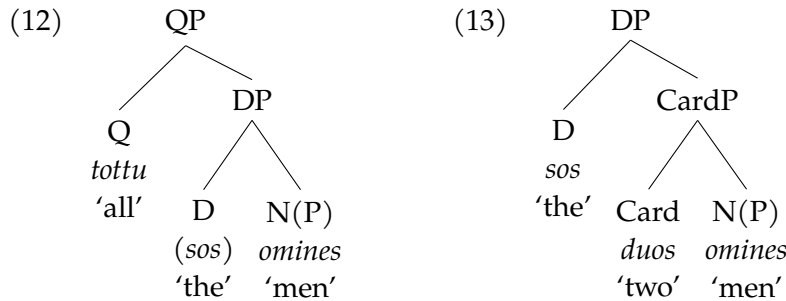
In what follows, I assume the theoretical framework of Chomsky (2000, 2001). Let me recall some basic features of this framework: Functional categories can have unvalued features (uFF), which search their c-commanded domain in the tree structure for a target (“goal”) with matching valued features (vFF). An unvalued feature or a bundle of unvalued features is called a “probe.” In case of a successful match, the uFF are valued with the features of the goal. This operation is called “Agree,” and overt agreement by morphological inflection is the result of spelling out the now valued features of the probe at phonological form (PF). Two more things need to be recalled: first, to be visible for a probe, a goal needs an unvalued feature; second, successful Agree can license movement of the goal, if the head containing the probe also bears a structure-building feature called an “[EPP]-feature.”<sup>15</sup> The latter is an instruction to the computational system of human language to project a specifier of the head that bears this feature, which is the target of the respective movement. Movement itself is seen as a copy process or “internal Merge,” with deletion of the original copy in PF.

The syntactic derivation of a sentence is a dynamic bottom-up process, taking items from the lexicon (“external Merge”) or from the existing part of the tree structure (“internal Merge” or “Copy”) to build up binary structures. The tree structure is handed over to the interfaces “phonological form” (PF) and “logical form” (LF) in parts (“spell-out”), once a piece (called a “phase”) is complete, but only certain functional heads (in particular,  $v^\circ$  and  $C^\circ$ ) can head phases. In the present article, I assume that  $D^\circ$  is also a phase head, at least in some languages, following Gutiérrez-Bravo (2001), Svenonius (2004), Chomsky (2008), Mensching (2019), among many others. Note that, at spell-out of a phase, only the so-called “phase domain” is handed over to interfaces (i.e., the complement), while the “phase edge,” that is, the head and the specifier, is not. Thus, only the phase edge remains visible to subsequent syntactic operations of tree-structure building, whereas the phase domain is opaque for syntax after spell-out.

Now, let us return to Old Sardinian adnominal *tottu* and its agreement properties. I will start from the standard assumption that *tottu* heads a QP with a DP as its complement, as shown in (12). For an expression like ‘the two men’ (without a quantifier), I assume that a cardinal number (Card) can have a nominal complement, and that CardP can be the complement of a determiner (D), as in (13):

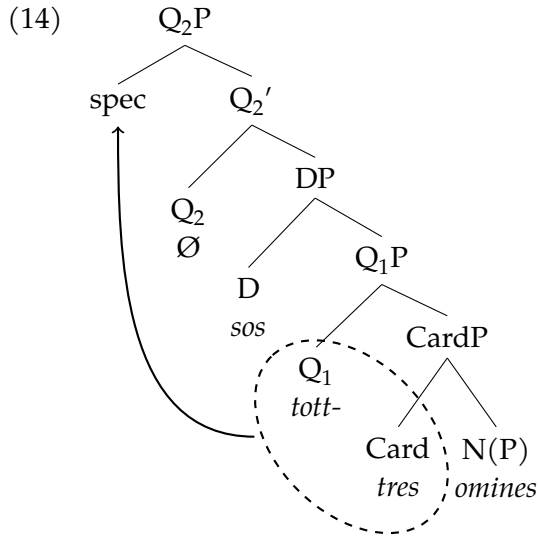
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<sup>15</sup> For edge features, see note 25.



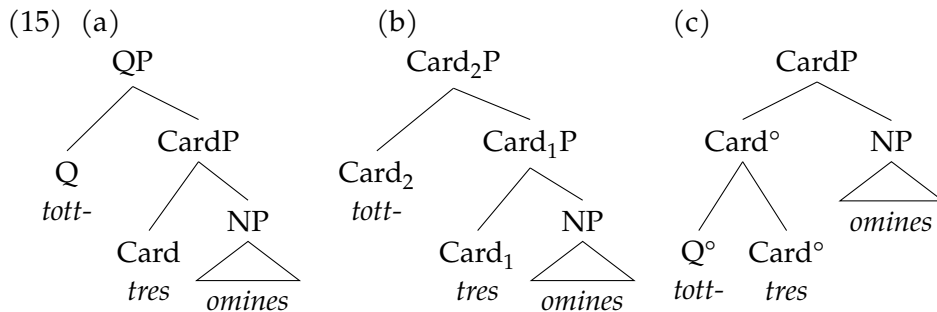
Moreover, I follow [Cirillo \(2009\)](#) and [Corver \(2010\)](#) in assuming that the two parts of a  $\forall$ NumQ are adjacent in their base-generated positions, without necessarily forming a complex head (see below for details). Recall that word order B from Section 3 ('all'+Det+Num+N) is not documented in Old Sardinian. However, if we put the structures in (12) and (13) together, this is exactly the word order that this would yield. To exclude this construction, I provisionally assume a constraint according to which, whenever a numeral is present in the QP, *tottu* must be merged with the numeral so as to form an  $\forall$ NumQ construction.<sup>16</sup> However, the fact that the Old Sardinian construction (e.g., *tottu tres sos omnes*, lit. 'all three the men') shows the quantifier in initial position rather seems to suggest that the whole constituent is a QP. How can we bring this together? My idea can be sketched as follows:

<sup>16</sup> The nature of this constraint must be left for future research. If the underlying structure is like in (14) below, one way to explain the Old Sardinian constraint would be to assume that *tottu* is marked in the lexicon as c-selecting either a DP or a CardP (see (22) in Section 4.3). In a Minimalist derivation along the lines of (14), at the moment when the CardP has been merged, there is no DP yet in the derivational space, so it is reasonable to assume that the quantifier merges with CardP, thus yielding the  $\forall$ NumQ reading. However, it is unclear to me why in languages that admit both word orders the quantifier can "wait" and be merged in a subsequent step (after the DP has been completed). Note that this constraint serves to exclude a structure that is not documented in the corpus. Of course, we do not know whether it was ungrammatical or whether it is just not documented. If word order B was grammatical, the constraint is not needed.



Here, similarly to [Corver's \(2010\)](#) analysis, *tottu* is base-generated adjacent to the numeral (which I take to be of the category Card), forming a lower Q<sub>1</sub>P and semantically yielding the  $\forall$ NumQ reading. In addition, I assume a higher left peripheral Q<sub>2</sub>P with an empty Q<sub>2</sub> head.<sup>17</sup> Under the view expressed in (14), the Old Sardinian structure would involve movement of *tottu* from Q<sub>1</sub>P to Q<sub>2</sub>P, with pied-piping of the numeral. Of course, the encircled parts in (14) cannot be moved together, as they do not form a constituent, so it will be necessary to assume that the NP moves to the left of Q<sub>1</sub>P, similarly to [Corver's \(2010\)](#) derivation, after which QP<sub>1</sub> undergoes remnant movement.

The exact base structure, that is, the lower part of the tree structure in (14), can be modelled in different ways. In (14), I chose (15 a), but (15 b,c) represent two other possibilities:<sup>18</sup>



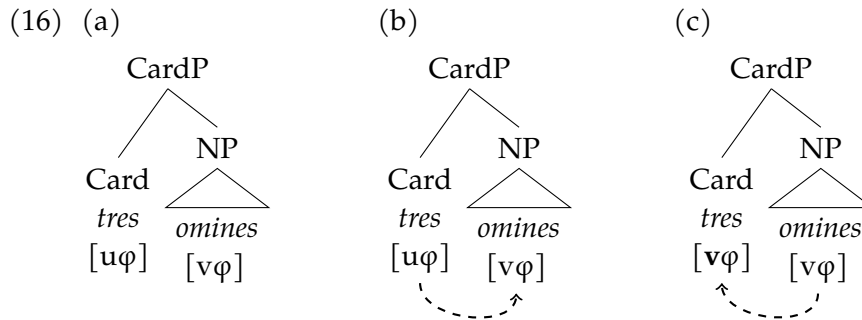
<sup>17</sup> I take Q<sub>2</sub>P to be necessary for ensuring that quantification scopes over the DP (where D is responsible for referent identification) and not vice versa. See Section 4.3.

<sup>18</sup> Following Minimalist practice, I do not represent vacuous 1-bar-levels. However, for more clarity, I do not follow all Minimalist labeling conventions, so, for maximal categories, I use XP instead of just X.

In (15a), *tottu* is merged in a (low) QP. (15b) is a shell containing two CardP layers. In (15c), *tottu* is a 0-bar adjunct to the Card head; this is essentially a formalization of the structure that Corver (2010) assumes.<sup>19</sup> I am assuming (15a), but all three views would be compatible with what follows. In Section 4.2, I sketch a Minimalist derivation along the lines of (14), returning to the issue of why agreement of *tottu* is obligatory here in 4.3. Before I turn to the derivation, let me say that, in principle, a simpler solution would be to consider *tottu*+Card and bare *tottu* as two lexical items with different agreement properties. However, in this article I prefer a more complex derivation, which has the advantage of deriving the different agreement patterns from general principles, in particular, the Minimalist view that the operation Agree is a necessary precondition for an XP to undergo movement.

#### 4.2 Derivation

Let me now show the derivation that I have in mind step by step, which starts with Merge of Card and NP to form CardP:



The noun *omines* ‘men’ bears valued phi-features ( $[v\phi]$ , 3<sup>rd</sup> p. pl. masc.), while the numeral *tres* ‘three’ bears unvalued phi-features ( $[u\phi]$ ),<sup>20</sup> as in (16a). As shown in (16b), the probe in Card finds  $[v\phi]$  of *omines* and is valued accordingly (Agree), as in (16c).

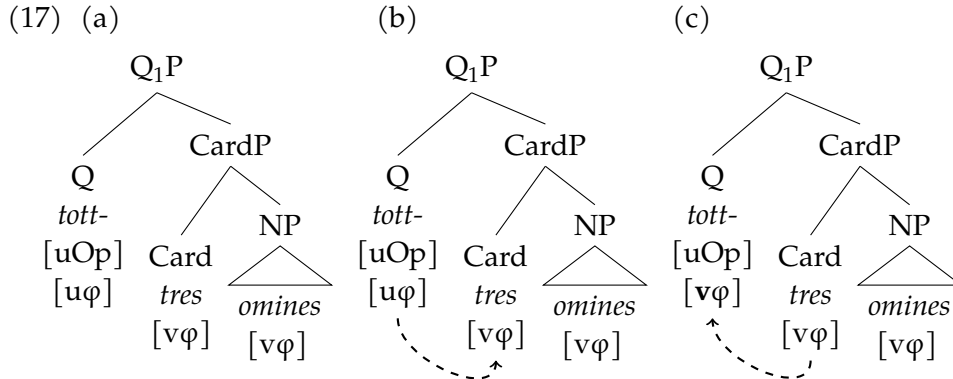
Next, as is shown in (17a), *tottu* is merged, which comes with both unvalued operator features ( $[uOp]$ )<sup>21</sup> and unvalued phi-features ( $[u\phi]$ ). The

19 For doubts on the idea that the sequence ‘all’+numeral forms a numeral by itself, see my brief discussion at the end of Section 3.

20 Although only the words for the numbers one and two show overt agreement in gender and number in Old and Modern Sardinian. Note that this is a simplified representation, which I retain for expository purposes. For example, as an anonymous reviewer remarks, it is certainly more plausible that the number feature on N starts off as unvalued and receives its value from the numeral. It is also possible that nouns do not have an inherent 3<sup>rd</sup> person feature and that this feature originates elsewhere (e.g., on the D head).

21 For operator features (which are essentially features that trigger A’-movement), see Radford

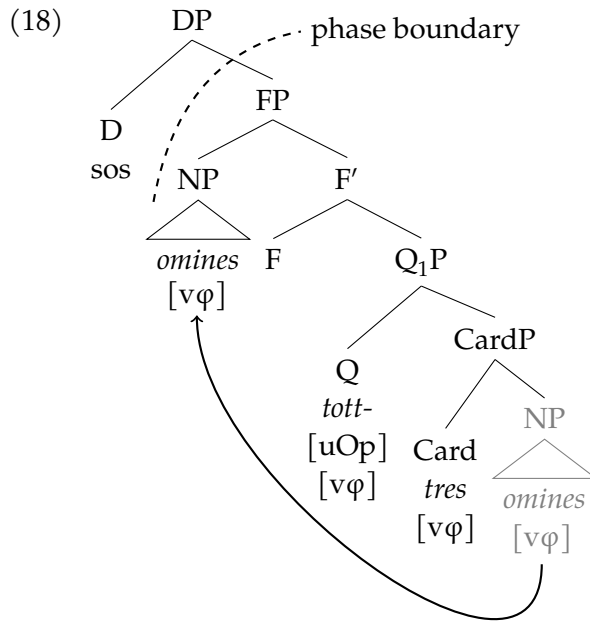
operator features will be needed later in the derivation for the higher  $Q_2$  to identify the target of attraction. In (17b), the probe in  $Q_1$  finds the nearest matching goal, which is Card (having  $[v\varphi]$  after the step in (16c)).  $[u\varphi]$  in Q undergoes Agree (feature valuation) with Card, as shown in (17c).<sup>22</sup> However, the operator feature remains unvalued, which is important for the further derivation, as we will see later on.



As a next step, we must assume that the NP is moved out of the CardP. Corver (2010) had already clearly seen the necessity of this step (because remnant movement will be needed in a later stage). For the reasons that I explained at the end of Section 3, the target cannot be the specifier of CardP (or NumP in Corver’s terms). But note that it is a quite widespread approach to assume one or more functional projections between DP and NP (see the overview and discussion in Alexiadou, Haegeman & Stavrou 2007), so I surmise that one of those projections is the target of movement here. This would essentially be the same functional projection that is held responsible for deriving postnominal adjectives (see, again, Alexiadou et al. 2007 and Mensching 2019). For expository reasons, I will not discuss the nature of this functional projection (FP) and leave this step as sketched in (18):

(2004: 419ss). The nature of [Op] in our case will be briefly discussed in Section 4.3.

<sup>22</sup> Cyclic Agree (see, e.g., Legate 2005), which means Probe and Agree with a goal whose features have been valued in a previous step.



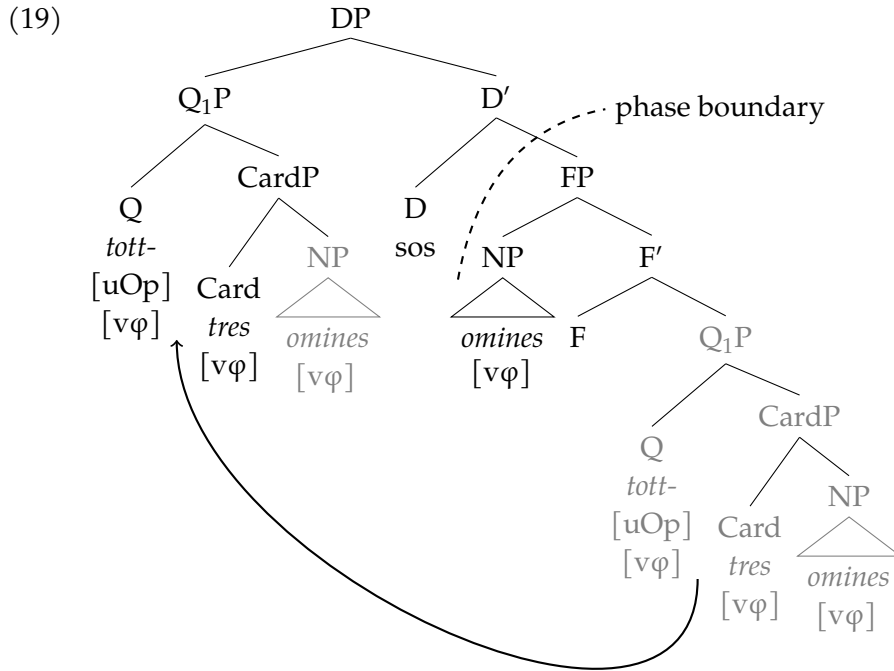
(18)<sup>23</sup> already contains the next step, which is Merge of the determiner.<sup>24</sup> Recall from Section 4.1 that I take DP to be a phase, so there is a phase boundary, meaning that the part to the right of the boundary will not be accessible to further computation. Therefore, according to standard Minimalist assumptions, the remnant of Q<sub>1</sub>P needs to move to the specifier of DP and thus to the phase edge, which serves as a kind of escape hatch:<sup>25</sup>

23 For expository reasons, I do not represent the operation Agree that takes place between D and the NP: the D head comes with unvalued phi-features, which are valued via Agree with the NP, yielding the plural form *sos* at spell-out.

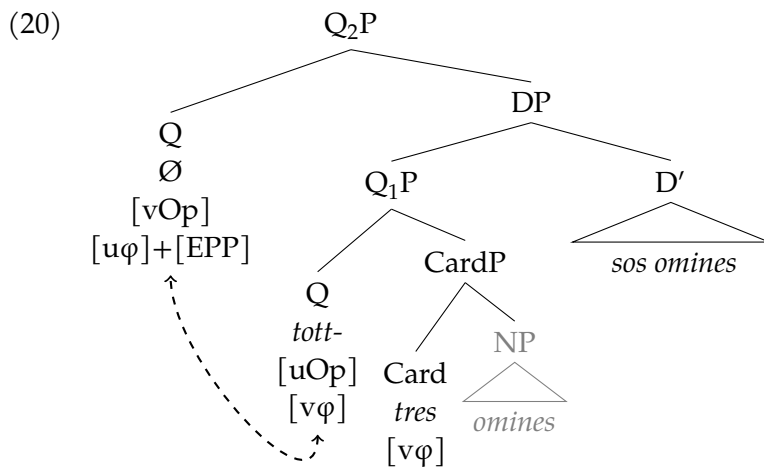
24 As I explained in Sections 2 and 3, the determiner was optional with *tottu* in Old Sardinian (also see note 10). In a structure without an overt determiner such as *tottu tres omines*, either no DP is projected or the D head is phonologically empty. If the former is correct, the step represented in (19) below does not take place, as there is no intervening phase boundary.

25 Chomsky (2008) assumes that, in addition to [EPP]-features, phase heads can optionally have other movement-inducing features, so-called edge features (EFs), which do not depend on a probe-goal relationship. In particular, a phase head can have an EF when it can trigger a movement step that causes some effect, such as a necessary intermediate movement step, in order for the derivation to converge (cf. Chomsky 2008: 149, Müller 2010). The edge feature is not represented here.

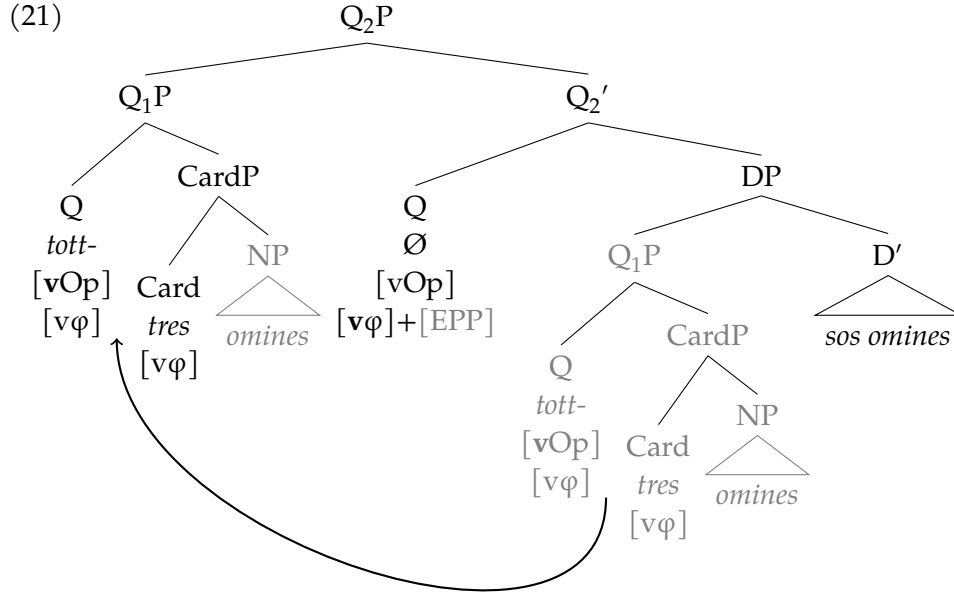




At this point of the derivation, the correct surface word order has already been established. However, Q still contains an unvalued feature ([uOp]). Unvalued features are uninterpretable at the interfaces and must therefore be valued before spell-out. I assume that the feature is valued by the head of the upper QP (Q<sub>2</sub>P), which has valued operator features ([vOp]) and unvalued phi-features ([uφ]) that come together with an [EPP]-feature:



As shown in (20),  $[u\phi]$  on  $Q_2$  undergoes Agree with the nearest matching goal, which is *tottu*. As a consequence, both the *probe's* phi features and the *goal's* operator feature will be valued. In addition, the goal will be licensed for movement to the specifier position created by virtue of the [EPP]-feature:



After spell-out, *tott-* plus  $[v\phi]$  (3<sup>rd</sup> p. pl. masc.) will become overt as *tottos*.

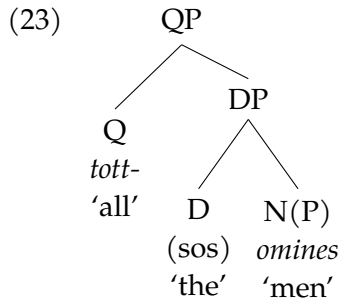
#### 4.3 Explanation of the Old Sardinian agreement facts and further discussion

As we saw in Section 2, agreement of Old Sardinian *tottu* was generally optional. Let us put aside for a moment the issue of the nature of the operator feature that I have assumed and concentrate first on the phi-features. Within our framework, optionality of agreement would mean that *tottu* can enter the derivation either with or without phi-features. This can be formalized with the following partial lexical entry:

- (22) *tott-*, Q  
 [\_\_ CardP/DP]  
 ( $[u\phi]$ )

The round brackets indicate that *tott-* can enter the numeration either with or without  $[u\phi]$ . The morphological surface form is determined after spell-out and before PF. When *tott-* has entered the derivation with  $[u\phi]$ , the phi

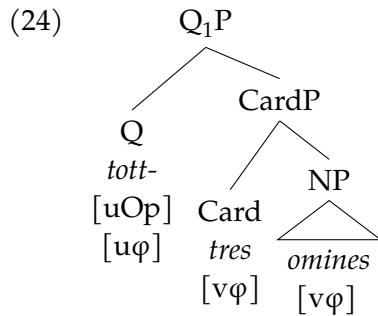
features are valued during the derivation, as shown in Section 4.2, and spelled out in the shape of adjectival personal endings. When merged without phi-features, *tott-* will receive the default masculine singular ending and will be spelled out as *tottu*. When *tott-* takes a DP complement, both options will lead to converging derivations, consider (23) (slightly modified from (12)):



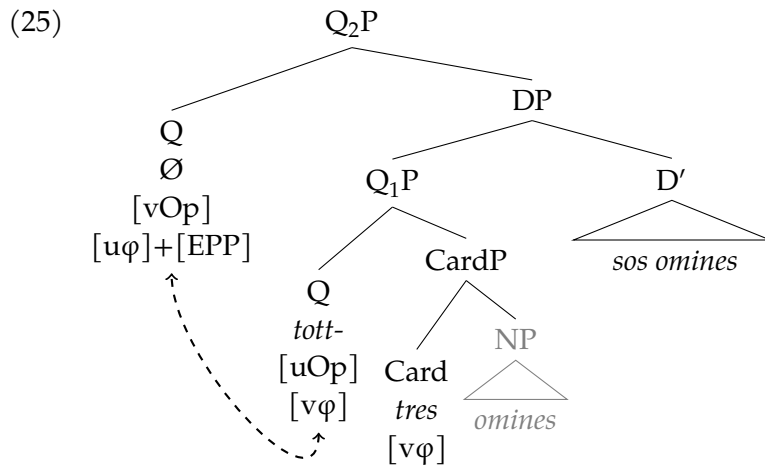
Here, when *tott-* has no phi-features, no feature mismatches can possibly occur. When  $[u\phi]$  is present, they will be valued via Agree with the NP. In both cases, the derivation converges. However, crucially, in the derivation involving a numeral sketched in 4.2, *tott-* is merged in a low position and, after its features have been valued,<sup>26</sup> becomes itself the target of a higher probe (belonging to the empty  $Q_2$  head in (20)). This means that it is not an option in this case to merge *tott-* without phi-features. If this happened, the higher Q probe could not identify its target, its  $[u\phi]$  would therefore remain unvalued, and the derivation would crash. Hence, agreement becomes obligatory in the construction at issue.

A remaining question is that of the nature of the operator feature that I have assumed and how it functions. I take this feature as well as the  $Q_2$  head itself to be related to quantification, so a thorough semantic discussion would be needed here, which goes beyond the scope of this article. Let me nevertheless sketch one possible scenario. According to Matthewson (2001), a generalized quantifier, at least in some languages but perhaps universally, is created in two steps, importantly involving an NP or DP complement (also cf. Kallulli & Rothmayr 2008). The idea is that the  $[Op]$  feature that I have assumed in my derivation always comes from the lexicon unvalued, and the value is set to ‘+’ at Merge whenever the sister of Q is a NP or a DP. Else,  $[Op]$  remains unvalued. Thus, in a configuration such as (23) above, the value of  $[Op]$  in Q will be set to ‘+’ (=  $[vOp]$ ). However, this is not the case when *tott-* is merged with CardP (see (17 a), repeated here as (24)), where  $[Op]$  in Q remains unvalued:

<sup>26</sup> The features are valued but not deleted. Later, in PF, they will be spelled out as the overt agreement morphology on *tottu*.



In contrast, the higher  $Q_2$  head is merged with DP as its sister, and [Op] will enter the derivation as valued, leading to the situation shown in (20), repeated here as (25):



## 5 CONCLUSIONS

In this article, I have addressed the puzzling agreement behavior of the quantifier *tottu* ‘all’ in Old Sardinian. Besides shedding light on an understudied syntactic phenomenon of the first documented historical stage of Sardinian, my article comes as a contribution to our understanding of what Cirillo (2009) has dubbed “universal numeric quantifiers” (∇NumQ).

Although agreement of Old Sardinian *tottu* with the NP over which it quantifies appears to have been optional, the documentary evidence suggests that it was obligatory once the NP itself was modified by a numeral. To account for this, I have proposed an analysis within the Minimalist Program. According to this analysis, which builds on preceding work by Cirillo (2009) and Corver (2010), the quantifier *tottu* is merged with a CardP, and, later

in the derivation, it is displaced together with the numeral to a higher position left-adjacent to the determiner, which yields the linear order attested for Old Sardinian: 'all'+Num+Det+N. In a nutshell, this movement operation is triggered by a phi-feature probe, and this is why *tottu* itself must enter the derivation with phi-features (eventually yielding overt agreement morphology). The derivation is driven by an unvalued operator feature on *tottu*, which is valued as part of the Probe/Agree process. The exact nature of the operator feature was not the focus of the article, but I have ventured the hypothesis that it expresses the need of the quantifier to be merged with an NP or DP as its sister at some stage in the derivation (see [Matthewson 2001](#) for this kind of analysis), and the feature remains unvalued until this requirement is met.

The linear order at issue ('all'+Num+Det+N) has been observed in other Old Romance languages. But, as far as I know, Old Sardinian is the only Old Romance language that permitted lack of agreement of the quantifier derived from late Latin *tōrtus*. In this article, I have taken the fact that agreement of the quantifier always shows up in the Old Sardinian corpus in contexts with a numeral as indirect evidence for certain structural processes that may possibly be assumed for the other Old Romance languages as well. More precisely, I have followed the general generative assumption that overt agreement can often be considered a reflex of movement. Outside Romance, a similar behavior is found in Dutch, so my findings may be of a more general, typological interest.

The further historical development of the syntax of *tottu* must be left for future research. On the one hand, an investigation on Sardinian texts from between the 16th and the 20th century remains to be conducted. On the other hand, the Modern Sardinian structures need more research. With respect to agreement, what we know is that a modern plural form *tottus* exists.<sup>27</sup> However, this form does not generally appear when *tottu* is adnominal<sup>28</sup> (with one exception noted below), but does appear in other functions and positions, such as predicatively. Note that this form *tottus* is even found in dialects that do not have raising of final /o/ to [u].<sup>29</sup> It must therefore be a modern innovation (*tottu+s* vs. Old Sardinian *tott+os*), as I have already pointed out in [Mensching \(in press\)](#). Thus, a hypothesis for the future investigation of the

<sup>27</sup> See notes 2 and 8.

<sup>28</sup> However, for the end of the 19th/beginning of the 20th century, examples with adnominal *tottu* agreeing in number (restricted to Campidanese) were reported by [Salvioni \(1909: 218\)](#): *tottus is cosas* 'all-PL the-PL thing-F-PL', *tottus is demonius* 'all-PL the-PL devil-M-PL.'

<sup>29</sup> The relevant masculine plural ending of adjectives and nouns is *-os* in Nuorese and Logudorese, but *-us* (with vowel raising) in Campidanese. In other words, only in Campidanese but not in the other two dialects can *-us* in Mod. Sard. *tottus* be interpreted as a regular masculine plural ending.

post-medieval documentation would be that the Old Sardinian inflection of *tottu* (*tottu*, *-a*, *-os*, *-as*), already mostly optional in Old Sardinian, was finally lost altogether in favor of the single form *tottu*. At some later stage, a new plural form *tottus*, invariable for gender, must have been created.

With respect to the use of adnominal *tottu* in combination with numerals in Modern Sardinian, an informal inquiry that I made with a small number of speakers of Logudorese and Nuorese varieties suggests that the following options are possible:<sup>30</sup>

- (26) (a) *tottu(s) e tres sos òmines*  
 all(-PL) and three the men  
 (b) *tottu sos tres òmines*  
 all the three men

The word order in (26 a) corresponds to the Old Sardinian pattern, but the conjunction *e* is certainly due to Italian influence (see Section 3, ex. (8 c)), whereas the order in (26 b) cannot be found in the medieval documentation. It follows the other pattern that is possible in Italian (see Section 4, ex. (8 b)) and may also be seen as an Italianism.<sup>31</sup> Only (26 a) optionally appears to admit agreement for some speakers.<sup>32</sup> For data such as (26 a) and the example provided by Jones (see note 30), an interesting question for future research would be whether such cases are residual to the Old Sardinian agreement behavior of adnominal *tottu* in combination with numerals. However, to answer these and other questions, a detailed dialectological investigation is needed.<sup>33</sup>

30 Jones (1993: 38) reports that *tottus tres òmines* is possible in some dialects. Note that the lack of the definite article, which is usually obligatory with adnominal *tottu* in Modern Sardinian, is striking here.

31 Alternatively, as an anonymous reviewer remarks, this word order would result straightforwardly from the loss of the constraint suggested in Section 4.1.

32 A similar variation between agreeing and non-agreeing *tottu* in this structure was observed in Campidanese by Salvioni (1909).

33 The situation is even more complex. For example, Jones (1993: 38) also reports on a form *tottas*, which appears with numerals and masculine (!) nouns (*tottas tres òmines*). See *ibid.* for a hypothesis. Research on plural marking in Sardinian dialects is complicated by the fact that word-final /s/ is subject to dialect-specific phonological rules, which not only alter the consonant (e.g., to [r]), but sometimes also lead to its erasure; see, among many others, Molinu & Pisano (2016). These authors show that, at some places, the rules affecting the final /s/ are morpho-phonological and are sensitive to the syntactic context.

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