

# Discourse-Linked DPs as Covert Partitives: Ellipsis and pro-form strategies in Italian and English

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## Abstract

The paper studies the conditions that determine the Discourse-Linked or non-Discourse-Linked status of noun-less Determiner Phrases introduced by different determiners, in Italian and in English. For instance, given the sentence *Ten bombs exploded yesterday*, the continuation *[Three] were cluster bombs* tends to have a meaning equivalent to ‘three of the bombs that exploded’ (D-Linked), while *[Three] will explode today* is understood as ‘three (different) bombs’ (non D-Linked). Beside world-knowledge, the syntax of the

determiners and their position with respect to the verb affect the availability of DL/non-DL readings. This and other facts undermine an analysis cast purely in terms of semantic domain restrictions, and suggest that DL readings are due to the presence of a covert partitive structure. While perhaps intuitive, this idea faces various issues in Italian, due to its interactions with the syntax of the pro-form *ne*. We show that an NP-based structure for numeral and proportion-based partitives (*three/half of the bombs*) is actually compatible with the facts, and offers a cue on the nature of sub-DP pro-forms and their uses.

**Keywords:** partitives, proportions, quantifiers, ellipsis, pronouns.

## 1. Introduction

This paper explores the structure and meaning of phrases like those among square brackets in (1a) and (1b), consisting in a determiner-like element with no visible nominal restrictor, referentially dependent on a context that makes a restrictor available (here, *bombs*). We refer to these elements as *Nounless-DPs*, NDPs for short.

- (1) Ten bombs<sub>*j*</sub> exploded yesterday over the town.
- a. [Three]<sub>*i*⊂*j*</sub> were cluster bombs. D-Linked
- b. [Three]<sub>*i*∩*j*=∅</sub> exploded today. non D-Linked: other bombs

(1a) and (1b) illustrate the two different referential relations NDPs can have with their linguistic context: referring to a subset of the entities introduced with it — the ten bombs that exploded mentioned in the premise — or simply referring to entities of the same type, which may or may not overlap with those mentioned before. The former is the so-called *D(iscourse)-Linked* (DL) *reading* (Pesetsky 1987); the latter, the *non-D-Linked reading*, nDL), forced here by the choice of predicate (*exploded*) and by the presence of incompatible time adverbials (*yesterday* and *today*). (1b) gives rise to two separate explosion events, hence to different sets of bombs.

As (1) shows, it is possible to systematically tease apart DL from nDL interpretations by manipulating the linguistic form and the lexical entries of the examples. The nDL reading is preferred when the DPs are parallel topics, as in list environments (2), and even forced when the predicates of the Noun-less DPs are inconsistent when applied to the same objects (2b).

- (2) a. Ten tourists have visited the US, two the UK, four mainland China.
- b. I bought three books and borrowed two.

Inconsistent numerals also block DL. This is illustrated in (3), where the cardinality of the NDP is greater than that of the antecedent DP, thus too high for the DL reading which would otherwise be favoured by the predicate in the continuation. Interestingly, this situation leads to strong deviance, not just to a nDL reading.

- (3) [Ten bombs] exploded. #Twenty were cluster bombs. inconsistent

Finally, DL readings appear to be available even when the second DP contains an overt noun (4). In this paper we mainly focus on the *nounless* cases, but we revisit cases

like (4) in §6.1, to show how they exemplify a strategy which is alternative to normal D-Linking, and has different properties.

- (4) [Ten old men]<sub>i</sub> lived in those houses.  
 a. Two old men<sub>j⊂i</sub> managed to escape the bombs.  
 b. Two men<sub>j⊂i</sub> managed to escape the bombs.

Hereafter, when required, we force the nDL reading through inconsistent predicates like those in (1b) or (2b), never inconsistent numbers like (3).

In this paper we consider three variables that affect the availability of the two readings: the type of ‘determiner’<sup>1</sup> in the NDP, the language, and the argumental role of the NDP. Regarding the first variable, we contrast numerals like *three*, proportional expressions such as *half*, and quantifiers like *someone*. As for the language, we compare English and Italian. Finally, we contrast preverbal with postverbal argumental positions: in English, this corresponds to subject vs. object, in Italian, to pre-V subject vs. post-V subject vs. object.

In a nutshell, our proposal is that the DL and nDL readings correspond to two different invisible syntactic structures selected by the visible ‘determiner’: a simple nominal (5a) for the nDL and a partitive structure (5b) for the DL.

- (5) a. Ten bombs . . . . Three ~~bombs~~ nDL  
 b. Ten bombs . . . . Three ~~of the bombs~~ DL

Italian was chosen to contrast English because in this language the presence of a post-V NDP argument must be accompanied by a clitic pro-form, *ne* which (following Belletti & Rizzi (1981); Cordin (1988); Falco & Zamparelli (2019)) we take to be a pro-NP (i.e. a DP subpart), roughly corresponding to English inflected *one(s)* in *three tall ones*, and glossed as such hereafter.<sup>2</sup> We will take a deeper look at *ne* in §4.1. What matters here is that the absence of *ne* leads to ungrammaticality (6a), unless the NDP is understood as referring to non-specific human beings (a [+HUMAN] feature) (6b):

- (6) a. Carlo aveva tre auto. Suo fratello \*(ne) ha vendut-o/-e due.  
 Carlo had three cars his brother (ONE(S)) has sold-SG/PL two  
 b. Ho visto due per strada.  
 I.have seen two for street  
 ‘I saw two guys in the street’.

Despite the superficial difference between the two cross-out elements in (5), we will argue that *ne* can easily correspond to both. This will require a proper analysis of the structures underling (5), but also more complex cases like *three quarters of the bombs*.

The proposal makes predictions on the readings available to the determiners found in the NDPs: those that can take either nouns or partitives, like numerals or *some*, will allow both DL and nDL readings; determiners that do not select partitives, like *somebody*, will not allow DL, and determiners that only select partitives will not allow nDL readings. The facts broadly support these predictions, but the situation is actually more complex in

<sup>1</sup> Proportional elements like *half* or *a quarter*, which belong in this class, are not determiners *strictu sensu*, hence the scare quotes.

<sup>2</sup> On the differences and similarities between *one(s)* and *ne*, see Falco & Zamparelli (2016).

post-V positions, due to the existence of two forms of *ne*: pro-NP and pro-PP. Overall, the proposal provides new insights on the structure of proportional phrases, on the nature of the *ne*, on the properties of quantifier domain restrictions and on the relation between syntactic structures and their context.

The rest of this paper is organised as follows. After a brief methodological introduction, §2 contains the fundamental contrast between numerals and proportions and between Italian and English. In §3 we spell out the proposal sketched in (5), and give two arguments against an approach that solely relies on semantic domain restrictions: one based on NDPs with conjoined antecedents (§3.1), the other on the Definiteness Effect (§3.2). Next, in §4 we detail the structure we adopt for overt numeral-based partitives, and how its mold fits the DL interpretation of NDP with numerals. §4.1 reevaluates Italian *ne*, spelling out the different syntactic properties of its two main forms. §5 describes the variant of the partitive structure used with proportion nouns, and discusses the peculiar distribution of determiners found with proportion nouns (*metà* ‘half’, *quarto* ‘quarter’, etc.). Left by itself, the structure proposed in §4 makes the prediction that *ne* should be impossible with post-V proportions, or at least that their meaning should always be D-Linked. This is consistent with the English data, but not with the Italian one, a contrast which is explained by the observation that Italian proportions can be measure phrases, see §5.3. §6 shows that the proposal correctly predicts that quantifiers yield DL readings if and only if they can take overt partitives and §6.1 considers the acceptability and meaning of quantifiers with overt NPs. This construction can make use of semantic/pragmatic contextual restrictions, but not establish truly D-Linked relations the way a real partitive can; a subsection, 6.2, looks at the DL readings of those post-V positions where *ne* is syntactically blocked. The observation is that when *ne* is structurally possible, not using it blocks the DL reading, but when *ne* is impossible, the DL is available even without it (with some caveats). §7 closes the paper.

## 2. Data: Numerals versus proportions

### 2.1. A note on methodology

To substantiate the paradigm presented in the introduction, we carried out a systematic data collection and analysis. Since these interpretive judgements are sometimes graded, we collected them for the core contrasts reported in the paper from at least 20 native speakers, both for English and Italian. The surveys used a Likert scale to express judgements ranging from 1 to 5, with 1 = ‘100% incoherent’ with the premise and 5 = ‘100% coherent’ with the premise. We implemented and presented the surveys online using Google Forms and the PsyToolkit platform (Stoet (2010, 2017)). The participants were selected and recruited through Prolific.<sup>3</sup> We performed statistical analysis on the collected data with the Wilcoxon two-sided test. The raw data and the R script used for the analysis are available on GitHub.<sup>4</sup> For simplicity’s sake in what follows we present examples with informal judgments (? , ?? , \*), supporting the distinction with plots of the experimental data.

<sup>3</sup> <https://www.prolific.co/>.

<sup>4</sup> GitHub repository: <https://github.com/dralfalco/covert>.

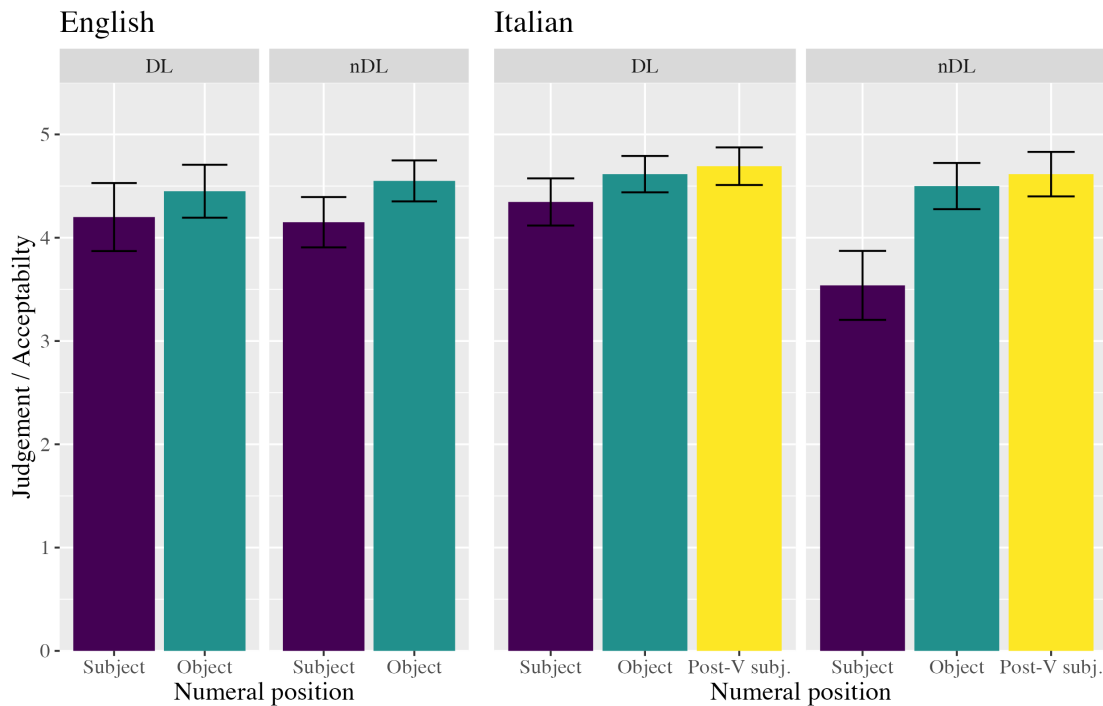
## 2.2. Numeral NDPs: English and Italian

Numeral NDPs show similar referential properties in English and in Italian. In pre-V subject position the nDL reading is somewhat degraded for Italian speakers, compared to English (see Figure 1). Since we tested with unaccusative verbs (*esplosere* ‘to explode’), our hunch is that the drop is due to the competition with post-V subjects, which are fully acceptable with this reading. D-Linked nominals, on the other hand, are topics, which in this language are normally realised in the left periphery of the clause (Rizzi, 1997).

- (7) Ten bombs exploded yesterday in this town. English Pre-V (= (1))  
 a. [Three] were cluster bombs. DL  
 b. [Three] exploded today. nDL, other bombs
- (8) [Dieci bombe]<sub>j</sub> sono esplos-e ieri in questa città. Italian Pre-V  
 ten bombs are exploded-PL.F yesterday in this town  
 ‘Ten bombs exploded yesterday in this town.’  
 a. Tre<sub>iCj</sub> erano a grappolo. DL  
 [three] were at cluster  
 ‘Three were cluster bombs.’  
 b. ?Tre sono esplos-e oggi. nDL, other bombs  
 [three] are exploded-PL.F today  
 ‘Three exploded today.’

The DL and nDL readings are both fully acceptable in the post-V positions of English and Italian. The latter, a *pro* drop language, has post-V objects but also post-V subjects, a configuration unattested in English. As mentioned above, Italian post-V NDPs require the clitic *pro*-form *ne* on the verb, accompanied by number and gender agreement with the *ne*-antecedent on the past-participle. We illustrate these cases with English objects (9), Italian objects (10) and Italian post-V subjects (11).

- (9) Yesterday ten bombs exploded. English post-V  
 a. We saw three before they hit. DL  
 b. Today, I heard three. nDL, other bombs
- (10) [Dieci bombe]<sub>j</sub> sono esplos-e ieri in città. Italian post-V Obj  
 ten bombs are exploded-PL.F yesterday in town  
 ‘Ten bombs exploded yesterday in this town’  
 a. Ne<sub>i</sub> ho sentit-e [tre *t<sub>i</sub>*]. DL  
 ONES I have heard-PL.F [three *t<sub>i</sub>*]  
 ‘I heard three.’  
 b. Oggi ne<sub>i</sub> ho sentit-e [tre *t<sub>i</sub>*] nDL, other bombs  
 today ONES I have heard-PL.F [three *t<sub>i</sub>*]  
 ‘Today I heard three.’
- (11) Ieri sono esplos-e dieci bombe in città. Italian post-V Sbj  
 yesterday are exploded-PL.F ten bombs in town  
 ‘Ten bombs exploded yesterday in town.’  
 a. Ne ho sentit-e [tre *t<sub>i</sub>*]. DL  
 ne I have heard-PL.F [three *t<sub>i</sub>*]  
 ‘I heard three.’



**Figure 1.** Acceptability of NDPs with numerals in English and Italian

- b. Oggi ne sono esplos-e [tre  $t_i$ ]. nDL, other bombs  
 today ne I have heard-PL.F [three  $t_i$ ]  
 ‘Today I heard three.’

Figure 1 highlights the parallelism between NDPs with numerals in English and in Italian, and Table 1 sums up the data on numerals in the two languages.

Numerals	English	Italian
Pre-V	DL / nDL	DL / ?nDL
Post-V object	DL / nDL	DL / nDL, presence of <i>ne</i>
Post-V subject	absent	DL / nDL, presence of <i>ne</i>

**Table 1.** Numerals in English and in Italian.

### 2.3. Proportions: English vs. Italian

We exemplify proportions with the case of *half*, which plays the role of the denominator in a fraction (i.e.  $\frac{1}{2}$ ). The Italian corresponding noun can optionally appear with a definite determiner (*la metà<sub>SN.F</sub>*) or bare (*metà<sub>SN.F</sub>*); we use the former (see §5 for our take on this optionality).<sup>5</sup>

Unlike numerals, NDPs containing proportions strongly prefer DL readings in

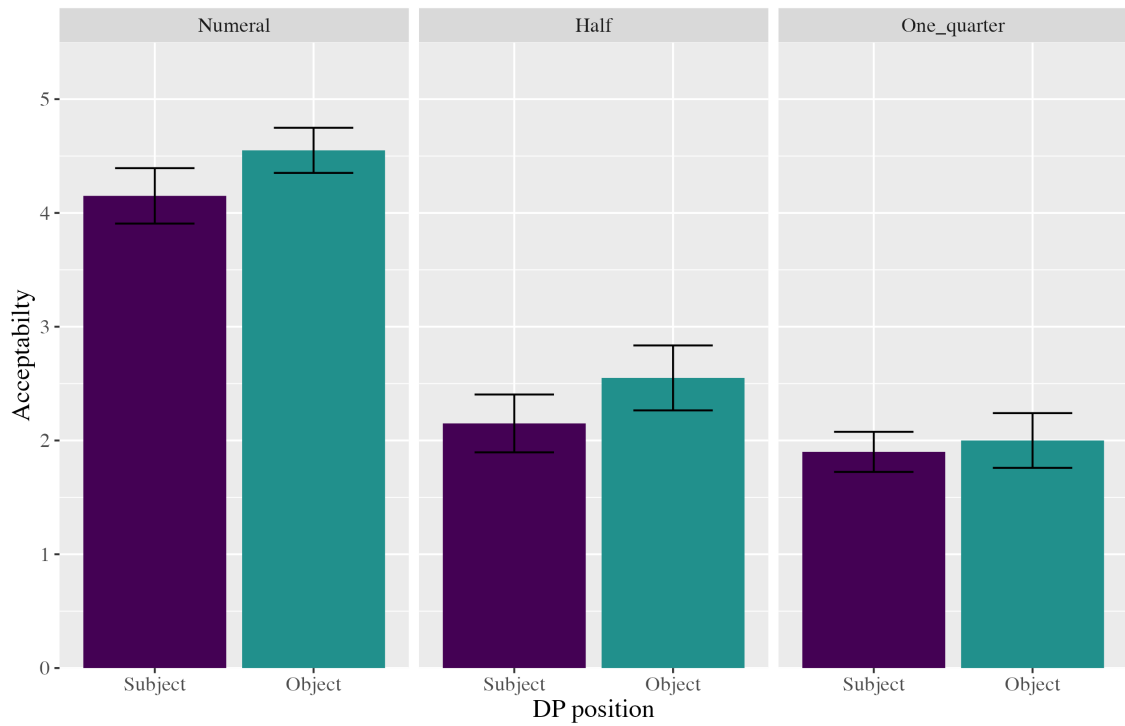
<sup>5</sup> For a detailed description and analysis of Italian proportions, their determiners and the cases where proportions end up violating conservativity see Falco (2023).

subject position, both in English and in Italian. When this reading is blocked by the impossibility of *ri*-explosions, as in (12b), the acceptability of the sentence drops (see the difference across the violet bars in Figure 2 and Figure 3). We mark these cases with the diacritic # indicating that they are grammatical *per se*, but unacceptable in the nDL-forcing context.

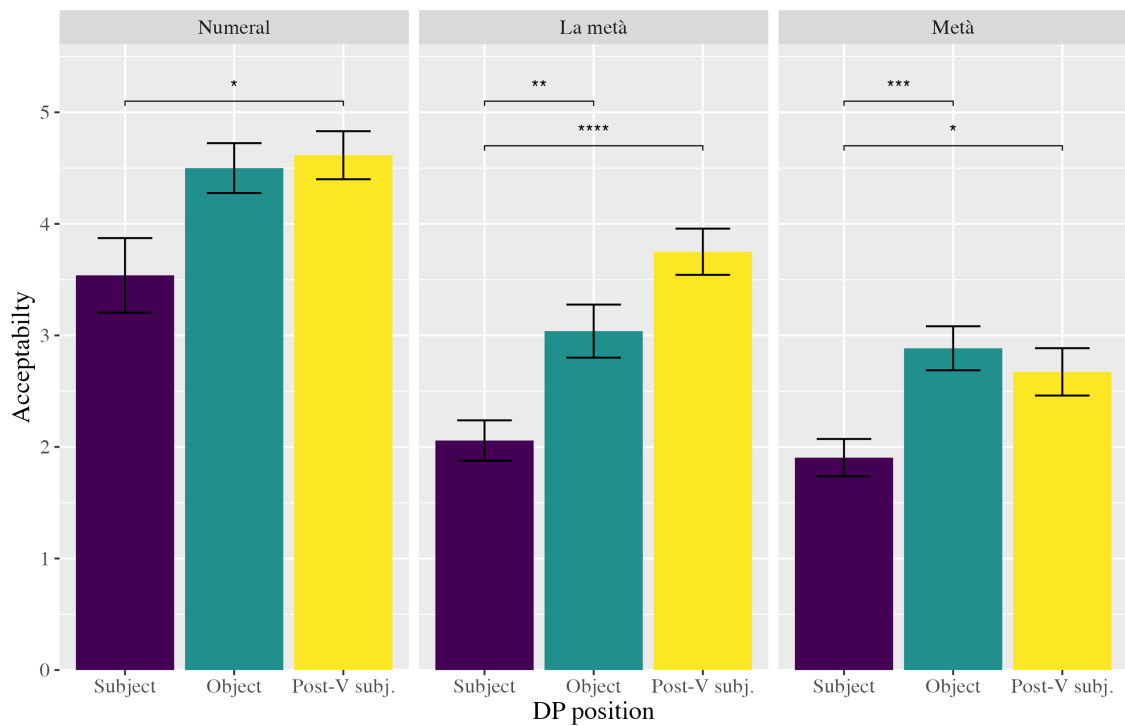
- (12) Yesterday ten bombs exploded in this city. English pre-V  
 a. Half exploded on military targets. DL  
 b. #Half exploded today. DL: ‘*ri*-explosion’ reading
- (13) [Dieci bombe]<sub>j</sub> sono esplos-e ieri in questa città. Italian pre-V  
 ten bombs are exploded-PL.F yesterday in this town  
 ‘Ten bombs exploded yesterday in this town.’  
 a. [La metà]<sub>iCj</sub> erano a grappolo. DL  
 [the half] were at cluster  
 ‘Half were cluster bombs.’  
 b. #[La metà] sono esplos-e oggi. DL: ‘*ri*-explosion’ reading  
 [the half] are exploded-PL.F today  
 ‘Half exploded today.’

Turning to the post-V positions, once again the *pro*-form *ne* is obligatory inserted in Italian, see (15) and (16). This time, however, Italian differs from English (14): both in object (15) and in post-V subject position (16) the DL reading is perfect, but the nDL is also fairly possible; this is not the case in English, see (14b) (for the nDL case, observe the difference across Figures 2 and 3).

- (14) Yesterday ten bombs exploded in this city. English post-V  
 a. We shot down half. DL  
 b. #Today, I heard half. DL: ‘*ri*-explosion’ reading
- (15) [Dieci bombe]<sub>j</sub> sono esplos-e ieri. Italian post-V Obj  
 ten bombs are exploded-PL.F yesterday  
 ‘Ten bombs exploded yesterday.’  
 a. Ne ho sentit-e la metà. DL  
 ONES I have heard-PL.F the half  
 ‘I hear half.’  
 b. Oggi ne ho sentit-e la metà. nDL with “today”  
 today ONES I have heard-PL.F the half  
 ‘Today I hear half.’
- (16) [Dieci bombe]<sub>j</sub> sono cadute ieri. Italian post-V Sbj  
 ten bombs are fallen yesterday  
 ‘Ten bombs fell yesterday.’  
 a. Ne sono esplos-e la metà. DL  
 ONES are exploded-PL.F the half  
 ‘Half exploded.’  
 b. Oggi ne sono cadut-e la metà. nDL with “today”  
 today ONES are dropped-PL.F the half  
 ‘Half the number of those that fell yesterday fell today.’



**Figure 2.** Acceptability of English nDL NDP with numerals and proportions



**Figure 3.** Acceptability of Italian nDL NDP with numerals and proportions



Table 2 sums up the data on proportions in English and in Italian, highlighting the asymmetry between the two languages in post-V positions.

Proportions	English	Italian
Pre-V	DL	DL
Post-V object	DL	<b>DL / nDL, presence of <i>ne</i></b>
Post-V subject	absent	<b>DL / nDL, presence of <i>ne</i></b>

**Table 2.** Proportions in English versus in Italian

### 3. Our proposal: The structures of DL and nDL readings with numerals

Our proposal is that nDL NDPs with numerals contain a simple NP restriction (17).

(17) [DP three [NP  $\text{\textcircled{bombs}}$ ]] nDL reading

In pre-V position, this restriction is elided (18a); in post-V position in Italian, it is replaced by the pro-form *ne*, which moves to the verb like any clitic pronoun in Italian (18b).

(18) [ Dieci bombe ]<sub>j</sub> sono esplose ieri in questa città.  
 [ ten bombs ] are exploded yesterday in this town  
 ‘Ten bombs exploded yesterday in this town.’

a. [DP Tre [NP  $\text{\textcircled{bombe}}$ ]] sono esplose oggi.  
 [DP three [NP  $\text{\textcircled{bombs}}$ ]] are exploded today  
 ‘Three (bombs) exploded today.’

b. Oggi *ne*<sub>i</sub> ho sentite [DP tre *t*<sub>i</sub>].  
 today ONES<sub>i</sub> I have heard [DP three *t*<sub>i</sub>]  
 ‘Today I heard three (bombs).’

Since D-Linked NDPs are also picked up by the Italian pro-form, *ne*, it is tempting to conclude that their structure is also (17), and that the difference between the two readings can simply be reduced to the absence or presence of additional *contextual restrictions*. In this approach, the DL NDP *two* in (19a) would be restricted by the intersection of  $\text{\textcircled{bombs}}$  (elided) and subsets of contextually salient pluralities (i.e., given three bombs that exploded, a, b and c, the set {abc, bc, ac, ab, a, b, c}). *Two* would thus filter not all bomb-pluralities in the domain, but only bomb-pluralities implicitly made salient by the antecedent *three bombs* (19b).

(19) a. Three bombs exploded. Two hit the target.  
 b. Two [bombs in C] = {abc, bc, ac, ab, a, b, c} ∩ {X : |X| = 2}  
 = {bc, ac, ab}

Contextual domain restriction is a pervasive, well-established phenomenon (see von Stechow 1994; Stanley & Gendler-Szabó 2000, a.o.): when I say *everybody came to my party*, what is understood is ‘everybody relevant’, ‘everybody who could be expected to come’. Using it to cover D-Linking would thus require no new tool (unlike, say, the double-index system proposed in Enç 1991 for similar purposes).

And yet, despite the appeal of this approach, we believe that in this case a purely semantic solution is on the wrong track. Our proposal, instead, is that Noun-less DPs with D-Linked readings are *covert partitives*, similar to over partitives like (20) but with a missing PP (*of the bombs*).

(20) [DP three of the bombs ] DL reading

Evidence in favour of this solution comes from that fact that DL NDPs have restrictions similar to those of the corresponding *overt* partitives, discussed in the next two subsections (§3.1 and §3.2). Additional support will be presented in §6, where we consider the behaviour of those quantifiers that disallow partitives, and in §6.1, where we look at cases where a numeral is accompanied by an overt noun.

### 3.1. Coordinated antecedents

As is well known, the object of a partitive *of* PP can be a plural definite DP or a plural pronoun referring to a plurality (21a), but not a conjunction of definites (21b) — an observation originally made in Hoeksema (1996) and discussed in de Hoop (1997), and Falco & Zamparelli (2019: §7) (see also (22), from Falco & Zamparelli 2019; similar results obtain for Italian and German). Acceptability ratings for (21a) given by 25 native speakers confirm this piece of data (see the numbers on the right, with "5"=perfectly natural; all differences significant).

- (21) The picture showed [a truck, a mechanic and a dog]<sub>i</sub>  
 a. Two of them<sub>i</sub> were in the lower left corner. Avg. 4.1  
 b. \*Two of [the truck, the mechanic and the dog] were ... Avg. 1.8
- (22) a. Some of {the boys / \*Jack, Marc, Luis and Tom} will not come.  
 b. I am looking for one of {my friends / \*the boy and the girl}.

Testing now NDPs with analogous antecedents, we find that the judgments of NDPs with conjoined antecedents like (23) and (24) are degraded and significantly worse than those of cases where the antecedent is a simple plural (e.g. *Four trucks came in yesterday evening. Three left this morning.*)

- (23) The picture showed [a truck, a mechanic and a dog].  
 ?Two were in the lower left corner. Avg. 3.2
- (24) John wanted two blue shirts and three grey sweaters.  
 ?Mary bought four. Avg. 2.8

The fact that the D-linked NDPs are not as bad as the conjoined cases in (21b)/(22) can be explained by the possibility that the elided part is understood as ... *of them*, rather than *of the truck, the mechanic and the dog*. On the other hand, if elision requires at least partial identity of lexical content, *two of the truck, the mechanic and the dog* should win out over *two of them*. This uncertainty results in the mixed ratings we obtained.

### 3.2. Definiteness effects

As first pointed out in Milsark (1979), definites trigger deviance in *there*-sentences in English (see also Zucchi 1995, McNally 1998, a.o.) (25).

(25) \*There is the guest at the door.

Partitives contain definites, and trigger the same effect, though possibly in a weaker form (26).<sup>6</sup> Interestingly, the same applies to the D-Linked NDPs in (27).

(26) a. There weren't many (\*of the) girls in the garden. Moro 1997: Ch.3, (66b)  
b. \*There aren't two of the four guests tonight.

(27) a. Marc expected four guests. \*There aren't two. i.e. 2 of the 4 are missing  
b. Marc thought that this problem could have at most four solutions.  
??I can prove there aren't two. in DL reading

Note that (27) would be fine with the nDL reading of the NDPs (... *There aren't even two (guests/solutions)*), but not if (27) is reporting the absence of some of the previously mentioned items (*four guests/four solutions*). If the DL construals of the NDPs headed by *two* in (27) reduce to partitives like those in (26), this pattern is accounted for.

### 4. The structure of overt partitive phrases

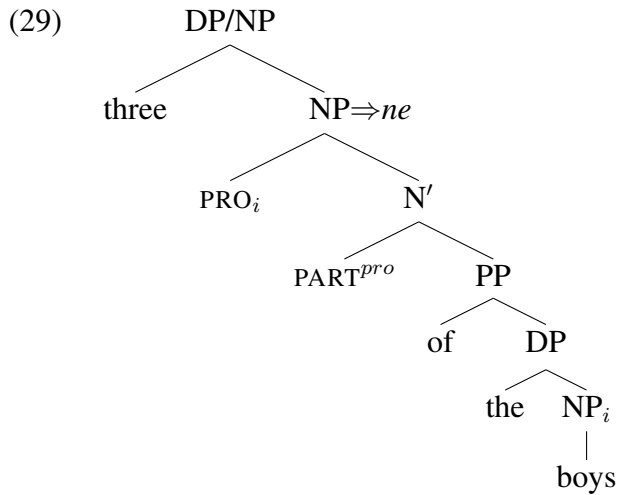
In this paper we adopt the analysis of overt, canonical partitives proposed in Falco & Zamparelli (2019) (henceforth F&Z).<sup>7</sup> F&Z's analysis belongs to a family of treatments (from Jackendoff (1977) to Cardinaletti & Giusti (2007)) which posit the existence of an invisible noun between the numeral and the PP proper ( $N^e$  in (28)).

(28) [DP/NumP Three [NP  $N^e$  [PP of the boys ]]]

F&Z's proposal differs from other accounts in this family in seeing  $N^e$  not as a syntactic placeholder, but as an active relational noun, which selects for an (invisible) pro-NP in its specifier and a (normally visible) definite DP in its complement (modulo *of*, a semantically null case marker), yielding the structure in (29). Crucially, the pro-NP is coindexed with the NP inside the definite (in (28), *boys*), so that it ends up denoting the restrictive property of the plural definite (here, the *set of pluralities of boys*).

<sup>6</sup> Thanks to Andrea Moro for pointing out this argument to us.

<sup>7</sup> By canonical, we refer to partitives introduced by numerals followed by a PP contains a plural definite, as in (28). See Falco & Zamparelli (2019: §2) for a list of other types of partitive-like constructions. The case of 'partitives' headed by proportions will be discussed below. Falco (2023) is entirely devoted to the study of proportions in Italian.



PART<sup>pro</sup> has a subtractive semantics: it removes from the set of pluralities found in its spec the denotation of the plural definite (the *supremum*, Sharvy (1980)), and returns the rest (30). This yields the effect of *proper partitivity* (\*one of the boy/\*two of my two ears, see Barker 1998). The effect is derived at a semantic level, unlike the analysis in Marty (2017), which derives it as a purely pragmatic effect.

- (30)  $\llbracket \text{of the boys} \rrbracket = \text{Pl}(\llbracket \text{boy+s} \rrbracket) - \text{MAX}(\text{Pl}(\llbracket \text{boy+s} \rrbracket))$   
 ‘the plural denotation of boys, minus its maximal element’

At a syntactic level, F&Z’s analysis derives cases where the pro-NP has been replaced by the NP raised overtly from inside the definite (as proposed in Kayne (1994); Zamparelli (1998)). This case is illustrated by English ‘inverted’ possessives (31), and by the Italian split-superlative construction (32).

- (31) a. Two friends of John’s  
 b.  $[\text{DP/NumP TWO } [\text{NP } [\text{NP friends}]_i \text{ PART}^{\text{pro}} [\text{PP of } [\text{DP John’s } t_i]]]]$
- (32) a. Due ragazzi dei più piccoli  
 two boys of.the most young  
 ‘two of the youngest boys’  
 b.  $[\text{DP due } [\text{NP } [\text{NP ragazzi}]_i [\text{PP de } [\text{DP i più piccoli } t_i]]]]$

In addition, (29) naturally covers the impossibility of conjoined definites seen in §3.1: conjoined definites are out simply because the pro-NP in [Spec,PART<sup>pro</sup>] cannot find a single NP to link to.<sup>8</sup> This is laid out in (33).

- (33)  $*[\text{DP One } [\text{NP PRO}_{i/j} [\text{N'} \text{ PART}^{\text{pro}} [\text{PP of } [\text{DP}_1 \text{ the boy}_i ] \text{ and } [\text{DP}_2 \text{ the girl}_j ]]]]]$

Unlike personal pronouns, which are capable of having split antecedents (e.g. *John picked up Mary and they had lunch*), elements anaphoric to properties do not seem to have this ability, as shown with the English pro-NP *ones* (34).

- (34) Mary has a cat<sub>1</sub>, a dog<sub>2</sub> and a parrot<sub>3</sub>. \*John has three nice ones<sub>1/2/3</sub>, too.

<sup>8</sup> As far as we know none of the other partitive theories is capable of capturing the ban on conjunction. In any other construction we are aware of, a conjunction of definites is fully equivalent to a plural definite.

#### 4.1. Italian *ne*: pro-NP or pro-PP

The two structures proposed in the previous sections for the readings at issue both contain an NP selected by the visible determiner: a simple restrictor for the non-D-Linked reading, and the NP headed by *PART<sup>pro</sup>* for the D-Linked one. If *ne* is a pro-NP, as we assumed in the introduction, this explains why post verbal NDP in Italian can be picked up by *ne* regardless of their readings. This picture also corresponds to the acceptability of both (35a) and (35b), where the *ne* antecedents are the bracketed phrases in topic position.

- (35) a. [Automobili]<sub>i</sub>, ne<sub>i</sub> ho viste poche.  
[cars]<sub>i</sub>, ONES<sub>i</sub> I.have seen few
- b. [Di queste automobili]<sub>i</sub> ne<sub>i</sub> ho viste poche  
[of these cars]<sub>i</sub> ONES<sub>i</sub> I.have seen few

(35) helps answering the question: what is the relation between *ne* and the elision site? In NDPs with *ne*, what is *ne* anaphoric to? We hypothesize that the elision is carried out at the level of a complex NP topic (*automobili* in (35)), which is picked up by *ne*, as illustrated schematically in (36).

- (36) [Four automobiles] ... [<sub>NP</sub> PRO of the four automobiles]<sub>i</sub>, [<sub>VP</sub> ... ne<sub>i</sub>+V ... [<sub>DP</sub> two *t<sub>i</sub>*]] DL

If this suggestion is correct, *ne* is simply a way to move the elision site from its *in situ* position to a left-peripheral position, where it is closer to the element that licenses the elision itself.

Adopting this analysis, we note that the distribution of *ne* is actually a bit more complex than what transpired from the data seen so far. As pointed out by Cordin (1988), *ne* can also pick up *di* ‘of’ PPs introduced by a verb (e.g. *parlare di* ‘speaking of’ in (37a)) or by a relational noun (e.g. *valore* ‘value’ in (37b)). We gloss this *ne* ‘of.it/them’.

- (37) a. Carlo ne parla bene.  
Carlo of.it speaks well  
‘Carlo speaks well of it/them.’
- b. La qualità del disco ne definisce il valore.  
the quality of.the record of.it dictates the value  
‘The quality of the record dictates its value.’

The two *nes* have different properties. Pro-NP *ne* cannot be moved across universal quantifiers such as *ogni* ‘every’ or demonstratives like *questo* ‘this’, etc. (38a). Moreover, it cannot be extracted from inside a predicate nominal (38b). Pro-PP *ne* has none of these restrictions, as illustrated in (39) with the extractions respectively from inside a universal DP, from a demonstrative and from a predicate nominal.

- (38) a. \*Di ospiti, ne conosco {ogni / ognuno / questi}  
of guests, ONES I.know {every / everyone / these}
- b. \*Ospiti, loro ne sono due.  
guests, they ONES are two

- (39) Quel quadro? Purtroppo Ugo non ne ...  
that painting? Unfortunately Ugo not of.it ...
- a. conosce ogni dettaglio. extraction from a universal Q  
knows every detail  
'Ugo doesn't know every detail of it.'
- b. apprezza questa versione. extraction from a demonstrative  
appreciate this version  
'Ugo doesn't appreciate this version of it.'
- c. è l' autore. extraction from predicate  
is the author  
'Ugo isn't the author of it.'

It is possible that this difference stems from the fact that only pro-PP *ne* ((37) and (39)) is licensed by a lexical category (verb or noun). Crucially, pro-PP *ne* is **not** licensed by the determiners that license pro-NP *ne*, in the absence of any verb or noun. In other terms, (40) does not have a possible derivation that uses pro-PP *ne* (see also Giusti (1992); Cardinaletti & Giusti (2007)).

- (40) \*<sub>[DP Quei ragazzi]<sub>i</sub> ne<sub>i</sub> conosco tre t<sub>i</sub></sub>
- <sub>[DP those boys]<sub>i</sub> of.them<sub>i</sub> I.know tre t<sub>i</sub></sub>
- intended meaning: 'I know three of those boys'

If this was not the case, the diverging behaviour of *ne* in pro-NP (38) and pro-PP cases (39) would be a total mystery. Pro-PP *ne* is irrelevant for the covert partitive cases seen so far, but the ambiguity of *ne* will play an important role in explaining the nDL meaning of proportions, presented in §2.3 and discussed in the next section.

## 5. The (in)definiteness of proportions

Unlike numerals, the proportions we saw in §2.3 force DL readings in all positions except Italian post-V NDPs, where nDL became possible. Following the analysis in Falco & Zamparelli (2019: §4.1), we tentatively take words like *half* or *quarter* to be relational nouns that *replace* the invisible noun PART<sup>pro</sup> in numerical partitives.<sup>9</sup> The number that appears before these words is merged as an argument of *half/quarter* in [Spec,NP]. F&Z suggest that it (or its features) raise to [Spec,D<sup>0</sup>], licensing the DP (41).

- (41) [<sub>DP</sub> [<sub>MeasP</sub> three]<sub>i</sub> D<sup>0</sup> [<sub>NP</sub> t<sub>i</sub> [<sub>N'</sub> quarters [<sub>PP</sub> of [<sub>DP</sub> the people]]]]]

The semantics for the expression in (41) proposed by F&Z is reported in (42c), assuming that  $\llbracket \text{of the people} \rrbracket = \llbracket \text{the people} \rrbracket = a$ . The choice of  $\leq$  means that proper partitivity is not required with proportions, making *three thirds of the people* semantically well-formed.

<sup>9</sup> This analysis might need some revisions to cover cases where *half/metà* directly precedes a noun, as in *metà strada* 'half way'. The set of nouns that can directly appear after *metà/half* is lexically and semantically restricted, so we do not analyze this structure here, reserving it for forthcoming work.

- (42) a.  $\llbracket \text{quarter} \rrbracket = \lambda e \lambda n \lambda x \exists u [x \leq e \wedge \text{AMOUNT}(x,u) = \text{AMOUNT}(e,u) \times n/4]$   
 b.  $\llbracket \text{quarters of the people} \rrbracket = \lambda n \lambda x \exists u [x \leq a \wedge \text{AMOUNT}(x,u) = \text{AMOUNT}(a,u) \times n/4]$   
 c.  $\llbracket \text{three quarters of the people} \rrbracket = \lambda x \exists u [x \leq a \wedge \text{AMOUNT}(x,u) = \text{AMOUNT}(a,u) \times 3/4]$   
 “the set of pluralities that are subparts of *the people* and whose amount, measured in *u*-units, is three quarters the amount of *the people*”

*Half* is similar, with one twist: since *two halves* is pragmatically awkward (it is equivalent to *the whole*), its default numerator is *1* (i.e.  $\frac{1}{2}$ ). We propose that *half* and its Italian counterpart *metà*<sub>F,SN</sub> allow a silent *una*<sub>F,SN</sub> ‘one’ (written as  $\emptyset_{\text{ne}}$  or  $\text{una}_{F,SN}$ ), which remains capable of licensing the DP by moving to [Spec,D<sup>0</sup>] (and reconstructing), or by transmitting its number features.

- (43)  $[_{\text{DP}} [_{\text{MeasP}} \emptyset_{\text{ne}}]_i D^0 [_{\text{NP}} t_i [_{\text{N}} \text{half} [_{\text{PP}} \text{of} [_{\text{DP}} \text{the people}]]]]]$

*Terzi* ‘thirds’, *quarti* ‘quarters’ and smaller proportions have multiple possibilities for numerators that yield amounts smaller than the whole: e.g. *1* or *2 thirds*. Since the identity of the numerator is not forced in these cases, these words can never be silent and a ‘bare *third/quarter/fifth/...*’ construction on the model of (43) is disallowed.<sup>10</sup>

The fact that the DP layer of proportions is licensed by a numeral makes them *indefinites*. This is confirmed by examples such as (44) (contrast with *\*The flowers are on the table and {the flowers / they} are on the mantelpiece*).

- (44) Half of the flowers are on the table and half on the mantelpiece.

Perhaps more surprisingly, proportions cannot be modified by restrictive relative clauses (RCs): in (45), the bracketed modifiers cannot attach to the larger DP introduced by *half/third*, only to the inner one (while this is possible in *the half of my apples that you took*).

- (45) a. \*Half of the students who came yesterday [that returned today]  
 b. \*One third of the apples that I gave you [that you sold]
- (46) a. One student who returned today is John.  
 b. One of the two boys who is here is Marc.

Numerals can certainly introduce nouns modified by RCs, even in partitive contexts (see e.g. (46)), so the deviance of (45) requires an explanation. If we adopt a head-internal analysis of RCs (Kayne (1994); Bianchi (1995)), the structure for the high attachment point of the relative should be one of those in (47).

- (47) a.  $[_{\text{DP}} D^0_{\text{SN}} [_{\text{CP}} [_{\text{DP}} \emptyset_{\text{ne}} \text{half of the students}]_i \text{that} [_{\text{IP}} t_i \text{returned}]]]$   
 b.  $[_{\text{DP}} \emptyset_{\text{ne}} [_{\text{CP}} [_{\text{DP}} \emptyset_{\text{ne}} \text{half of the students}]_i \text{that} [_{\text{IP}} t_i \text{returned}]]]$   
 c.  $[_{\text{DP}} \emptyset_{\text{ne}} [_{\text{CP}} [_{\text{DP}} \text{half of the students}]_i \text{that} [_{\text{IP}} t_i \text{returned}]]]$

In (47a), however,  $D^0_{\text{sg}}$  would be empty, and unlicensed; moving the (silent) *one* from inside the relative CP to license it (as in (43)) would require an illicit left-branch

<sup>10</sup> An anonymous reviewer informs us that the situation is analogous in Romanian, which allows the definite only with ‘half’ (and ‘majority’).

subextraction from inside a relative island.<sup>11</sup> *One* should then be merged outside the relative, as in (b) and (c). But in (47b), the DP has two semantically active numerals (cf. ??*one one half*); it is not clear, moreover, why the external *one* should elide. In (47c), *half* is missing its numerator argument. The last structure is of course perfectly possible in (46). Thus, the strong deviance of proportions with relatives supports the idea that the D-layer of these constructions is licensed differently than in indefinites like (46).

### 5.1. On the weak definiteness of ‘halves’

While all of the facts given in the previous section hold identically in Italian, this language has the additional option of introducing the noun *metà*, ‘half’ with a definite determiner (as discussed in §2.3; see the judgments in Fig 3, right columns). F&Z (§4) try to approach this discrepancy in terms of the long-standing observation that Italian (like most Romance) requires a definite with mass nouns in cases like (48), while English excludes it.

- (48) \*(La) {democrazia / libertà / qualità} è in pericolo.  
 (the) {democracy / freedom / quality} is in danger  
 ‘(\*The) {democracy / freedom / quality} is in peril.’

To spell this out within the structure in (43), F&Z (§4.1) must however fit *metà* ‘half’ into the mold of (abstract) mass nouns like *quality*.<sup>12</sup> The problem is that, just like *half/halves*, Italian *metà* pluralizes, so it is not mass. Moreover, the option of adding a definite is not open to *terzo* ‘third’ (see (49)), or other bigger denominators (*quarters*, *fifths*, etc.).<sup>13</sup>

- (49) (\*L’) un terzo della torta va a me, i due terzi che restano ai figli.  
 (the) 1 third of.the cake goes to me, the two thirds that remain, to.the kids

Proportions like *half of the cake* might be ambiguous between denoting a physical object (a generous slice from the whole cake) and referring to a measure, calculated from the size of the cake. Since measures are in some sense ‘unique’ (‘halves’ can be obtained by multiplying the whole by **the** number ‘0.5’), it might be tempting to think that the definite appears in Italian whenever *metà* is used as a measure. Unfortunately, the measures *0.3*, *0.25* etc. are equally ‘unique’ in this sense but, as (49) shows, thirds (or quarters, etc.) do not allow the definite in the absence of restrictive modification. Moreover, *metà* is used as a measure in (50), yet the definite is not required.

<sup>11</sup> This might extend to extractions from other positions within the relative head: (ia and b) both improve if the relative is removed.

(i) a. ??Which portrait<sub>*t*</sub> did you meet the [[painter of *t*<sub>*i*</sub>] that is your relative]?  
 b. ??The portrait [[whose painter *t*<sub>*i*</sub>] that is your relative] died young fetched a high price.

<sup>12</sup> We thank an anonymous review for prompting us to revise the analysis of this issue.

<sup>13</sup> F&Z use the same strategy to justify the fact that *percentages* (e.g. *3% of the income*) take a singular definite in Italian, but not in English. In this case an explanation built on the contrast in (48) has a better chance of being correct: in Italian percentages the definite is obligatory, and it extends to all percentages, not just to 100% or 50%. See F&Z for discussion.



- (50) La poltrona era larga (la) metà del divano.  
 the armchair was wide (the) half of the sofa  
 ‘the armchair’s width was half the width of the sofa.’

We would like to approach the problem differently, splitting the question in two parts: why the definite is only allowed with *metà*, but not with other proportions; why is (sometimes) allowed in Italian, but never in English.

To try answering the first, we want to explore the idea that the definite we see in Italian is in fact a member of the family of so-called *weak definites* (WDs): DPs where the uniqueness of definite determiners apparently fails. WDs can be ‘long’ or ‘short’ (in terminology of Leonetti (2019)): long WDs have complements whose (in)definiteness determines the (in)definiteness of the whole (see Poesio (1994); Barker (2005)): *the daughter of a linguist*, *the side of a building* (no uniqueness of daughters or sides); short WDs are cases like *John had a stroke as he was reading **the** newspaper, so they took him to **the** hospital using **the** highway to be faster* (no contextual uniqueness of newspapers, hospitals or highways, see Carlson et al. (2013)). Short WDs are fragile: not all nouns support this meaning, and even with those that do, setting up a context with a salient potential antecedent tends to trigger the normal, token-level meaning of the definite (51). A context that makes available potential antecedents without resolving them is also distinctly odd, see (52), from Carlson et al. (2013).

- (51) The library was half empty, and a newspaper was folded on the table. John read the newspaper for half an hour.
- (52) a. The plumber was in [the slammer], because he didn’t pay his taxes.  
 b. ?The plumber was in [the slammer], because a pipe burst in cellblock 4.

Rather than treating these as cases where the definite has been ‘bleached’ of its meaning (as proposed by Vergnaud & Zubizarreta (1992) and Longobardi (1994) for related constructions), most current proposals try to hold on to the idea that the article delivers uniqueness, but attribute the ‘weakness’ of the whole constructions to the idea that this effect applies at a more abstract level (the level of kinds, see Aguilar-Guevara & Zwarts (2013), or ‘types’, see Le Bruyn (2014); Leonetti (2019), or the VP as a whole, via semantic incorporation, Carlson et al. (2013)). We second the intuition of many authors (Barker (2005), Le Bruyn (2014), a.o.) that the entity selected by a singular WD is in some sense *arbitrary* or *irrelevant*, but we prefer to implement it without transiting through a kind denotation (as proposed instead for *plural* Italian WDs in Zamparelli (2002)). Specifically, we propose that the uniqueness applies to an *arbitrary singleton subset* of the original property (the set of newspapers or hospitals). *Singleton*, because the uniqueness is linked to a situation, see e.g. (53): the weak definite could not be used if one normally read multiple newspapers or was brought to multiple hospitals when sick. *Arbitrary*, because the context should make clear that it does not matter which subset one chooses.

- (53) John was reading the *one* newspaper *people normally read in newspaper-reading situations*.

Slightly more formally, a singular definite applied to a non-singleton property P can be understood to apply to a singleton subset of P (i.e. P’) if and only if (i) the com-

plement of P with respect to P' (P–P') fully satisfies the restriction of the definite and (ii) replacing P' with another subset of P does not cause truth-value differences with respect to contextually salient predicates. Clause (i) will be relevant for proportions smaller than half (see below). (54) shows that clause (ii) clearly applies to *la metà*: here the context introduces halves with different positions or weights, so the bare/indefinite version is preferable.<sup>14</sup>

- (54) a. (?La) metà dei fiori era lì e (?la) metà qui.  
 (the) half of.the flowers was there and (the) half here  
 b. La ruota aveva {??la / una} metà più pesante dell' altra.  
 the wheel had { the / one} half more heavy than.the other

Italian seems to extend the WD construction to *inalienable possession* cases, which require a possessor in English, but take a definite article in French or Italian (55) (see Vergnaud & Zubizarreta (1992); Guéron (1978). Le Bruyn (2014) explicitly connects this construction to WDs).

- (55) Per rispondere alle domande, gli studenti devono alzare **la** mano.  
 to answer to.the questions, the students must raise **the** hand  
 'To answer questions, the students must raise **their** hand.'

In both languages, the possibility of using a singular is sensitive to quantity: parts with more than two alternatives, like *limbs*, are worse than parts that come in pairs, like *arms* or *legs*, see (56) (assuming that no limb or strand of hair is contextually salient).

- (56) Per controllare i riflessi, i chirurghi chiedono ai pazienti di {muovere  
 To check the reflexes, the surgeons ask to the patients to {move  
 il braccio / alzare la gamba / ??alzare l' arto / ??toccarsi il capello}  
 the arm / raise the leg / raise the limb / touch+SELF the hair strand}  
 'To check reflexes, surgeons ask patients to {move their arm / raise their leg /  
 ?raise their limb / ??touch their strand of hair}'

This could be a pure effect of quantity (the more the alternatives, the less likely it will be that picking one will be the same as picking any of the others), or hinge on intrinsic diversity of the alternatives (limbs differ in shape and function, arms don't).

While not canonical body parts, halves are in the same relation with the whole as body-parts to body-wholes, so we suggest that Italian treats them on a par. The Italian-English contrast with definites in proportions could now be attributed to the fact that the latter does not take halves as suitable nouns for weak definites, or that it classifies them as inalienable possessions but cannot use the definite for them.

The first question of this subsection, namely the failure of Italian *il quarto* 'the quarter' / *il terzo* 'the third', could now be reduced to growing number of alternatives, or to the fact the complement of the  $\frac{1}{3}$  of the cake in (49) does not 'fully satisfy' the property

<sup>14</sup> Note that *metà* has a complement, so it should *prima facie* be mapped onto the 'long' WD construction (e.g. *the daughter of a linguist*); unlike in these cases, however, the non-uniqueness of the halves is not affected by the fact that the (partitives) complement of *half* is always definite. We hypothesize that this is due to the fact that the *di/of* PP expresses a different relation (subpart) than the relation expressed by the relational nouns of canonical long WDs.

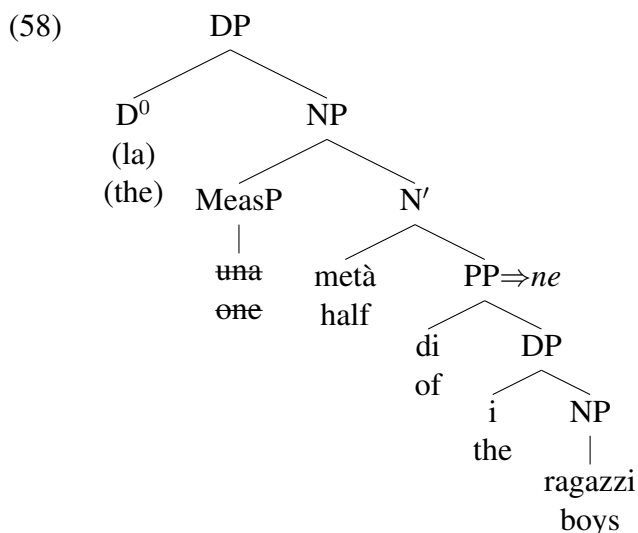
of being ‘ $\frac{1}{3}$  of a cake’: it is, obviously,  $\frac{2}{3}$ . The only fraction for which the complement part has the same size as the chosen part is of course  $\frac{1}{2}$ .

Fully formalizing this intuition would take us too far from the main topic of this paper, but if this suggestion is on the right track, it would have the advantage of connecting proportions to the widely studied phenomenon of weak definites and inalienable possessions, which could lead to further insights.

## 5.2. The origin of “ne” in proportions

The next problem raised by proportions within our analysis of covert partitive structures is purely syntactic. The structure we assumed in (41) does not explain why Italian can use *ne* in post-V cases ((15) and (16)): a pro-NP *ne* should *replace* the NP [~~una~~ *metà*], not leave it stranded. Fortunately, we have another option. Recall that Italian has a pro-PP version of *ne* used with relational nouns ((37) and (39)), and that *metà* is indeed relational. (57) shows the same effects we saw in (37) and in (39): *ne* can be extracted from predicate nominals with *metà* (57a) and from a demonstrative DP (57b). We conclude that the *ne* we see with *metà* in the DL reading is the pro-PP ‘of it/them’ meaning, not the pro-NP ‘ones’ meaning. The structure in (41) can now be fully specified as (58):

- (57) a. Vedi quello spago? Questo pezzo *ne* è la metà esatta.  
 see that string? This piece of it is the half exact  
 ‘See that string<sub>i</sub>? This piece is the exact half of it<sub>i</sub>.’
- b. Ecco il testo. *Ne* ho corretta questa metà, tu correggi l’ altra.  
 here.is the text. Of.it I.have corrected this half, you correct the other  
 ‘...I have corrected this half of it/them, you correct the other.’



There is thus no obstacle to assuming that Italian object and post-V subject DL proportions with *ne* are also covert partitives, where *ne* plays the role of the PP object of *metà/half*. In the next two subsections we turn to two final issues with post-V proportions: the nDL reading in Italian (§5.3) and the agreement variability we see on the verb (§5.4).

### 5.3. Non D-Linked readings with proportions

If proportions like *metà* ‘half’ or *quarto* ‘quarter’ can only select partitives, the straightforward prediction is that they should always trigger D-Linked readings. This seems correct enough for English: as Figure 2 illustrates, forcing a nDL reading causes a significant drop compared to numerals. In Italian, however, a nDL reading is quite acceptable in *post-V* position, especially with subjects and with the definite article, see Figure (3). Post-V cases always require *ne* (see (15b) and (16b)).

How is nDL possible in post-V, and why only in Italian? Pro-PP *ne* does not help here, as it would predict the wrong reading (DL), and pro-NP *ne* has nothing to pick up inside a structure like (58), except possibly the lowest NP. But *la metà* may well be followed by a demonstrative (59); pro-NP *ne* cannot be extracted from under a demonstrative (see (38) above), yet *ne* remains very much obligatory. (59) clearly shows that *ne* cannot come from anywhere inside the bracketed proportion. So, it must come from outside.

- (59) Ieri, dieci bombe<sub>i</sub> ... (Bombe), oggi ne sono esplose [la metà di yesterday, ten bombs<sub>i</sub> ... (Bombs), today NE are exploded [the half of quelle<sub>i</sub>].  
those<sub>i</sub>]  
‘Yesterday, ten bombs... Today, a number of bombs that was half that of yesterday.’

The solution of this riddle comes from the observation that in Italian proportions may be used within relative clauses as *measure phrases* (MPs). When these MPs modify a nominal that comes with its one numeral, as in (60), they can only apply their meaning to the noun, in a distributive fashion: what is halved in (60) is the size of each individual bomb.

- (60) Ho visto tre bombe (che erano) la metà di quelle.  
I have seen three bombs (that were) the half of those  
‘I have seen three bombs, each of which was half the size of those (other) bombs.’

We propose that when no numeral is present (or when the NP outside is replaced by *ne*) the proportion acts as a type of (reduced) *amount relative* (see e.g. (61), Carlson 1977) where *la metà* sets the dimension of the plural NP. This is indeed the meaning we get with (62).

- (61) They will never put together [the troopers they had in WW2.] amount RC  
(62) Oggi ho sentito bombe, la metà di quelle di ieri.  
today I heard bombs, the half of those of yesterday  
‘yesterday I heard bombs, half the number as those that fell yesterday’

When the bare NP *bombe* is pronominalized by *ne* and the complement of the modifier *meta* is elided, the structure becomes (63), which gives the illusion that *ne* comes from under *metà*. In actual fact, *metà* acts as a modifier of the property denoted by *ne*.<sup>15</sup>

<sup>15</sup> We leave open whether a relative clause is the best way to capture the modifier relation between *ne* and *metà* in (63). In (60) there is a prosodic break before *la metà*, pointing to the fact that what the RC is restricting is not the lower NP level but a higher projection (NumP?). These break is not present with (63).

- (63) ... (bombe,)  $ne_i$  ho viste [ $_{DP} t_i$  [ $_{RC}$  la metà [ $_{PP}$  ~~di quelle bombe $\bar{i}$ ]]]]  
 ... (bombs), ONES I have seen [ $_{DP} t_i$  [ $_{RC}$  the half [ $_{PP}$  ~~of those bombs $\bar{i}$ ]]]]~~~~

If this idea is on the right track, we could explain the absence of the nDL reading in the English case with the observation that English simply does not have the structure corresponding to (62): (64) is ill-formed.

- (64) \*I have heard bombs, (that were) half of those.

This approach also accounts for the fact that the nDL reading is not available in pre-V position: in Italian, argumental bare plurals are limited to post-V positions (see Contreras 1986 for the original observation in Spanish, and Longobardi (1994), a.o., for Italian).

#### 5.4. Agreement variability in Italian

In testing the acceptability of post-V subjects with proportions we observed an effect of number (on the auxiliary, and on the participle), and an interaction with the presence/absence of the definite article *la* ('the $_{S.N.F}$ ') before *metà* (65).

- (65) a. *ne è esplosa la metà* 'NE is exploded $_{S.N.F}$  the half'  
 b. *ne sono esplose la metà.* 'NE are exploded $_{P.L.F}$  the half'  
 c. *ne è esplosa metà.* 'NE is exploded $_{S.N.F}$  half'  
 d. *ne sono esplose metà.* 'NE are exploded $_{P.L.F}$  half'

As a subject, *la metà* allows both singular or plural agreement (the same applies in English: *half of the boys was/were tired.*). In Italian, this fact holds across pre- and post-V positions, as shown in Figure 4. In §2.3 we showed that the post-V position is much better to get the nDL reading, but the verb number discrepancy we see in (65a)-(65b) is not statistically significant. Removing the determiner, however, causes a significant drop in acceptability w.r.t. *singular* verbs (1.88 in the DL reading, 1.19 in the nDL). Why is this the case?

In the analysis of proportions we are pursuing, the plural features (along with the gender features that appear on the past participle) must be carried by the pro-form *ne* (corresponding to a bare plural in the nDL and to the PP in the DL reading<sup>16</sup>). The singular form is then likely to appear as an agreement attraction from the DP containing *metà*. When this DP is headed by *la* ('the $_{S.G.F}$ '), as in (65a)-(65b), the singular number is transmitted to the verb via a *pro* in the canonical subject position.<sup>17</sup>

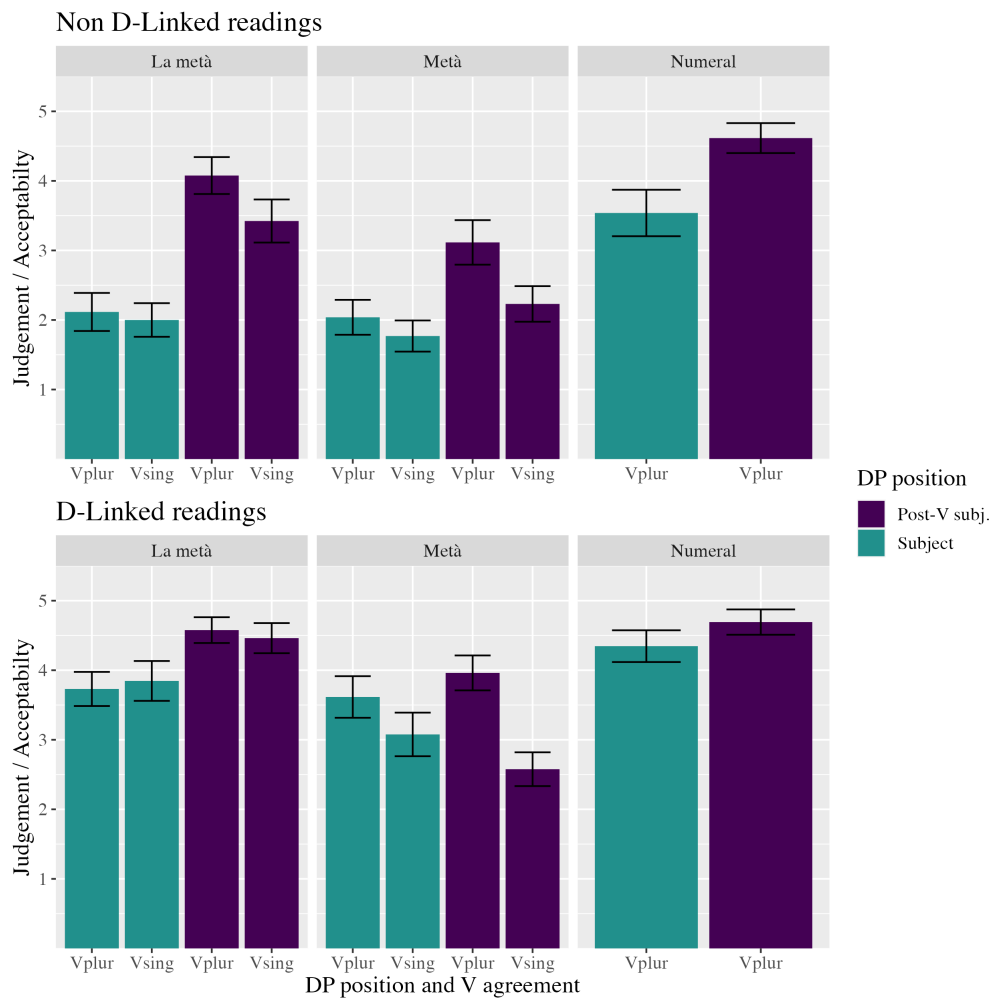
- (66) [ $_{TP} pro_i$  è/is [ $_{VP}$  [ $_{VP}$  ne+esplosa ] [ $_{DP_i}$  la [ $_{NP}$  metà ... ]]]]

But when this DP does not contain any visible article (the 'bare *metà*' cases), we have proposed that  $D^0$  is licensed by a covert form of the numeral *una* ('one $_{S.G.F}$ '), which is

This could be due to fact that the NP has been extracted, but we do not have a precise account at present.

<sup>16</sup> Note that we have to assume that the P *di/of* is transparent to gender/number feature transmission (see Manzini 2019). Supporting evidence comes from the fact in Italian the definite article routinely combines with prepositions, forming *preposizione articolata* (e.g. *di+i* 'of+the'= *dei*); the *di*+DEF-ART complex can even function as an indefinite determiner, triggering verb agreement.

<sup>17</sup> As observed by a reviewer, the same effect could be obtained if *pro* is replaced by a mechanism of Downward Agree, see Baker (2008) a.o.



**Figure 4.** Effect of verb number on Italian numerals and proportions, by position and by reading

in turn licensed by *half*. We suggest that this invisible D is *feature-defective*, thus hardly capable of transmitting singular via *pro* in a configuration like (66). Cases where an invisible pronoun is unable to connect to a feature-defective antecedent are well-documented in other domains, like sentential antecedents in Greek (Iatridou & Embick, 1997) and Italian (Delfitto, 2003). Cases closer to the topic at issue here can be found by looking at the pre- vs. post-verbal position of distributive conjunctions like *both John and Mary*.

- (67) a. Sia Marco che Luigi {sono / ??è} arrivati/o.  
 both Marco and Luigi {are / ??is} arrived  
 b. {È / Sono} arrivato/i sia Marco che Luigi.  
 {is / are} arrived both Marco and Luigi

While pre-V conjoined subjects strongly require plural verb agreement, the same conjunctions quite freely allow singular and plural agreement when a post-V subject. The same subject object asymmetry is visible in Figure 4, regardless of readings: in post-V position singular NUMBER from *metà* has an harder time reaching the verb.

## 6. Quantifiers: partitive and non-partitive selecting

We have so far focused our discussion on numerals (which may or may not have partitive continuations) and proportions (which require partitives, modulo footnote 9). We now turn to the third logical possibility: quantifiers that do not take partitive complements. Examples in English are *everyone*, *everybody*, *someone*, *somebody*, *no-one* (restricted to people) *everything*, *something*, *nothing* (restricted by and large to ‘things’); in Italian, *nulla* ‘nothing’, *niente* ‘nothing’, *qualcosa* ‘something’, *ogni cosa* ‘every thing’. The selectional properties of some Italian and English Qs are summarised in Table 3.<sup>18</sup>

Quantifiers	part-D	non part-D
English	some (of the people/things)	<b>somebody</b> (*of the people)
	each (of the people/things)	<b>everybody</b> (*of the people)
	none (of the people/things)	<b>nobody</b> (*of the people)
	most (of the people/things)	<b>nothing</b> (*of the cars)
	which (of the people)	<b>everything</b> (*of the cars)
	how many (of the people)	<b>something</b> (*of the cars) <b>what</b> (*of the cars)
Italian	nessuno ‘no/no-one’ (✓+part)	nulla ‘nothing’ (*+part)
	qualcuno ‘some/someone’ (✓+part)	niente ‘nothing’ (*+part)
	ognuno ‘every one’ (✓+part)	entrambi ‘both’ (*+part)
	quale ‘which one’ (✓+part)	cosa ‘what’
	quante ‘how many’ (✓+part)	

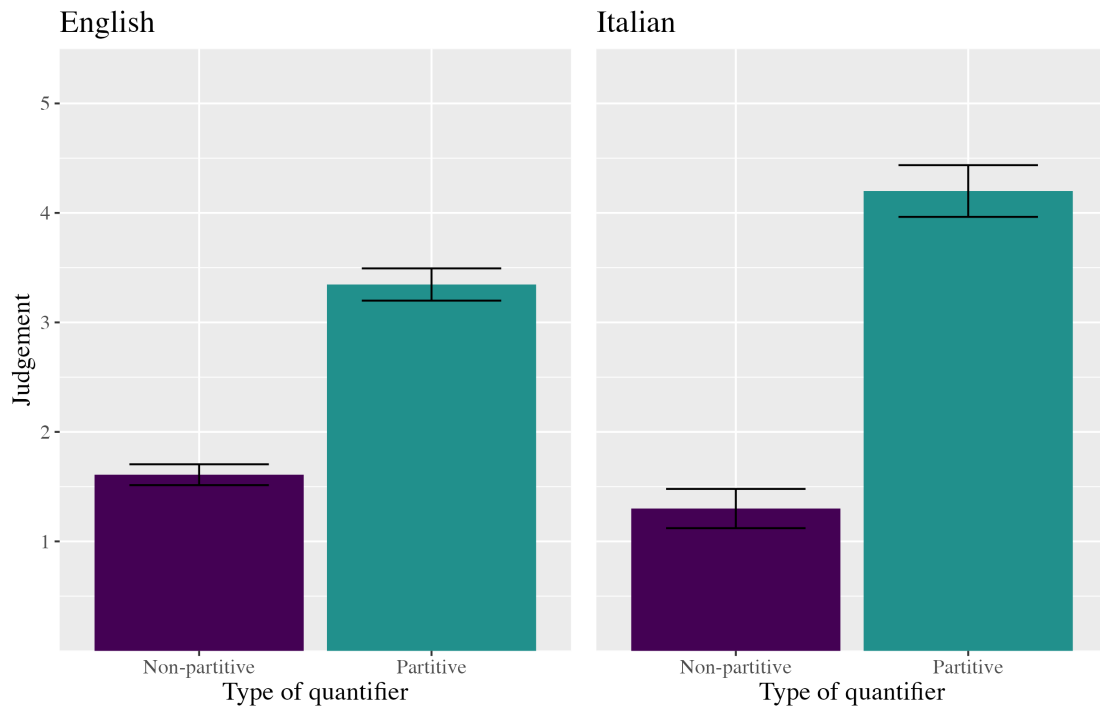
**Table 3.** Quantifiers that do or do not allow partitive restrictors

Qs that do not take partitives have a nominal morpheme (evidenced in **bold** in English) more or less tightly combined with the quantificational morpheme. In our analysis this is not a coincidence: the [ $\pm$ HUMAN] restriction carried by *-one*, *-thing* and *-body* originates in the N head, preempting the  $PART^{pro}$  noun that is needed to make the partitive work.

Our prediction is that if a Q does not license a partitive but just an implicit N restriction, it should not be able to have a DL reading. Before testing with the quantifiers in Table 3, we observe that we find the same situation in Italian with numerals. Recall that Italian numerals in post-V argumental position must be associated with *ne*. The only exception is when the numeral takes a [+HUMAN] restriction ((6b) above). Thus, (68) is perfectly grammatical without *ne*, but it is *not* D-Linked to the tourists who arrived.

- (68) Sono arrivati [quattro turisti cinesi]<sub>i</sub>. Ho visto due<sub>\*j⊂i</sub> per strada.  
 are arrived [four tourists Chinese]<sub>i</sub>. I have seen two<sub>\*j⊂i</sub> in street  
 ‘Four Chinese tourists arrived. I saw two people in the street’ (not some of the tourists who arrived).

<sup>18</sup> A note of clarification. Many Italian quantifiers seem to contain the morpheme *-uno* ‘one’, such as English *someone*, *no-one*, yet they allow partitives. We assume that the Italian form is the number 1 (visible also in English in *every one of the boys*), while the English incorporated case is the pro-NP *one(s)*, which does block partitives.



**Figure 5.** Possibility to D-Link only to the most recent plurality introduced

(68) is based on our own judgments. To rest on safer grounds in cases where the evaluation might be more subtle, we collected the judgments of 50 native speakers (25 English, 25 Italian) on the behaviour of a subset of the partitive and non-partitives quantifiers in Table 3. Given a context like (69), we asked our English speakers to judge if the sentences with part-Ds (69a) and non part-Ds (69b) meant “D person in the courtyard PRED” or “D girl PRED”. In Italian we tested a similar context using *nulla* ‘nothing’ vs. *nessuno* ‘no-one’.

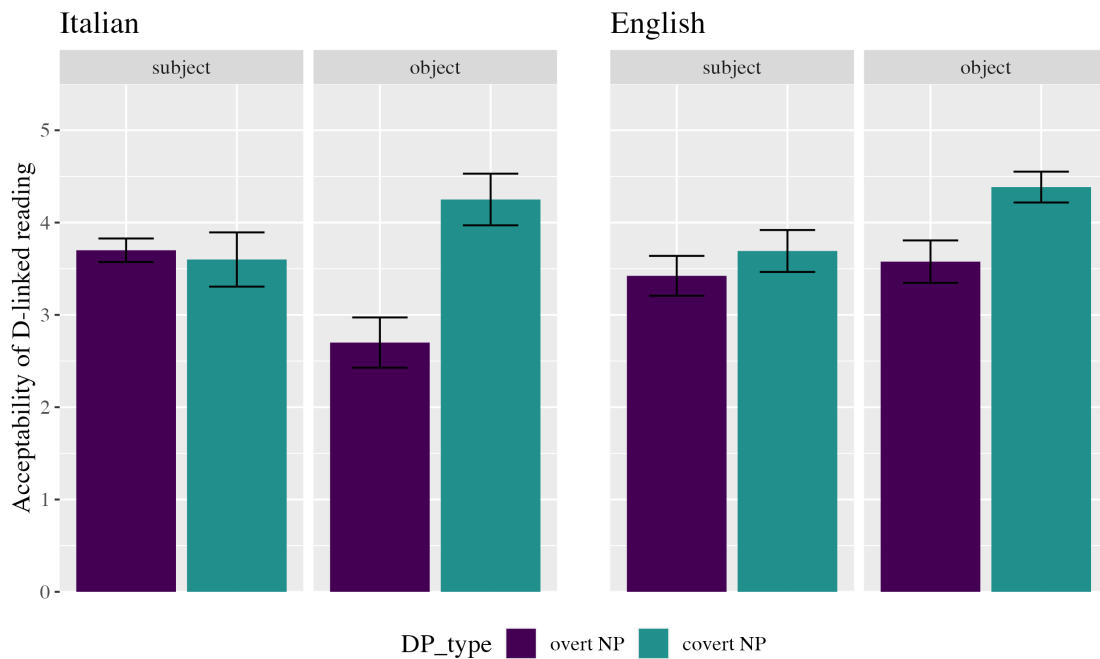
- (69) Three boys were waiting in the courtyard when five girls arrived.
- [Some / None] {had a colourful hat / spoke for a while}. part D
  - [Someone / Everybody / Nobody] {had a colourful hat / spoke for a while}. non-part D

The results, in Figure 5, overwhelmingly show that the non-partitive determiners in (69b) span the whole group (all the persons, not just the girls), while the partitive quantifiers can easily target just the girls.

Quantifiers come with domain restrictions, which are especially visible in universal cases. Indeed, *everybody* in (69b) can hardly be interpreted as ranging on more than the people in the context set up by the previous sentence. However, at the end of the sentence the context contains both boys and girls, and that’s where the reach of the contextual restriction stops: only a syntactic analysis, one that posits an implicit partitive form, can manage to pick out only the just-introduced nominals — the girls that entered in (69), or the tourists that arrived in (68).



## D-Linking with DP with overt vs. covert NP



**Figure 6.** Possibility of D-Link readings with overt vs. covert NPs (subject vs. object)

### 6.1. Numerals with overt nouns: D-Linking vs. contextual restrictions

To complete the picture of the difference between nominal semantic restrictions and elided partitives, we contrasted cases where a numeral, in English or Italian, is or isn't followed by an overt noun, in subject (70a) or object (70b) position. All cases were placed in a context that favoured D-Linked readings, and the participants were asked to judge how much the follow up could refer to a subset of the same trucks (5 = certainly).

(70) Ten trucks arrived at the workshop yesterday...

- |    |                                       |                |
|----|---------------------------------------|----------------|
| a. | {Two / Two trucks} will go out today. | <i>Subject</i> |
| b. | Today we fixed {two / two trucks}.    | <i>Object</i>  |

The ratings are reported in Figure 6: in subject position, both Num+NP and Num alone seem to have easy access to the previously mentioned objects. In object position, the Num-NP version drops significantly in Italian, in favor of the use of *ne*, but remains stable in English.

Should we conclude that in subject position even the Num+NP triggers (or can be coerced to trigger) an invisible partitive reading? Or that, in contrast to the results in the previous section, the hypothesis of a hidden partitive is after all not necessary to obtain a D-Linked reading? None of these conclusions is necessary. The subset effect (the new indefinite is a part of a previously introduced set of objects) can be achieved in two different ways: with an invisible partitive (the only strategy that we would properly term 'D-Linking') or with a purely contextual restriction on NP, when a noun is visible. Using a paradigm similar to the one in the previous section, it is easy to show that the two strategies have different effects. Consider (71):

- (71) Un ricevimento era in corso. C' erano venti paste alla crema sul  
 A reception was ongoing. There were twenty tarts with cream on the  
 tavolo. Più tardi, il cameriere portò dieci paste alla nocciola.  
 table. Later on, the waiter brought ten tarts with hazelnut.
- a. Alla fine della serata, nessuna era stata mangiata.  
 at the end of the evening none had been eaten.
- b. Alla fine della serata, nessuna pasta era stata mangiata.  
 at the end of the evening, no tart had been eaten.

Both (71a and b) are perfectly acceptable. Suppose however that several of the cream-filled tarts have been eaten, but no-one touched the hazelnut-filled tart (the participants were just too full). Now (71b) simply becomes false, in Italian as in English, while (71a) can still be a truthful description. Both cream and hazelnut tarts are tarts, yet the contextual restriction route is unable to separate the latter from the former group, while the partitive hidden after *nessuna/none* can easily do that.

One could object that the effect is due to the fact that the (implicit) definite in the (implicit) partitive in (71a) is *the hazelnut tarts*, but this misses the point, which is how come the 'contextual' part of 'contextual restriction' cannot zoom in on the later part of the context-providing situation, the point where the hazelnut tarts are introduced. Note, moreover, that the NDP in (71a) could never *just* pick up the former group (by supplying the invisible restriction *delle paste alla crema* 'of the cream tarts'). This is most likely due to the interference of the latter potential antecedent, the hazelnut tarts.

The same effect can be demonstrated when the second group has no *additional* modifiers:

- (72) Cinque ragazze con lunghe gonne a fiori erano sedute su un muretto.  
 five girls with long gowns with flowers were sitting on a wall  
 Tre ragazze arrivarono dalla città.  
 three girls arrived from the city
- a. Nessuna portava la gonna. *i.e. none of the 3*  
 none wore the skirt  
 'none wore skirts'
- b. \*Sei portavano la gonna. *#6 of the 3 / \*6 of the 8*  
 six wore the skirt  
 'six wore skirts'
- c. Sei ragazze portavano le gonne. *#6 of the 3 / ✓6 of the 8*  
 six girls wore the skirts  
 'six girls wore skirts'

(72a) is not contradictory, since it is understood as *none of the girl who arrived*. The higher number blocks this partitive reading in (72b); a meaning *6 among the total of 8 girls* is mathematically sound, but unobtainable due to the same effect we saw above in (3). Adding an overt noun (72c) makes this reading possible again, as the overt NP now easily picks all the girls, not just the new arrivals. Once again, this shows that NDP with DL readings are hidden partitives. Examples like (70) simply do not bring out the differences that exist between covert partitives and contextual restrictions.

## 6.2. When *ne* cannot be realized

We have seen that in post-V argument position Italian uses *ne* with any NDP, unless the NDP receives a non-specific [+HUMAN] interpretation, as in (6b) above or (68). What happens when a NDP is in object position but other syntactic factors conspire in making *ne*-impossible? Does the construction become ungrammatical, or if not, which meaning remains available? The present section addresses this question.

All our post-V subject examples so far used unaccusative verbs (with auxiliary *essere* ‘be’). Unergative verbs like *telefonare* ‘to telephone’ are known not to freely allow *ne* from their post-V subjects (Belletti (1988); we find these cases less than completely degraded, and mark them as ?? in (73a)). We follow Longobardi (2000) in assuming that the post-verbal subjects of these verbs may be too high to allow for a well-formed chain between *ne* and its trace or unpronounced copy. Turning to transitives, *ne* can be extracted from direct objects, but not from inside PPs ((73b) and (73c)). Finally, strong distributive quantifiers block pro-NP *ne* even when all other conditions are satisfied ((73d), see also (38) above).

- (73) a. ??Parlando di clienti<sub>i</sub>, ne<sub>i</sub> hanno **telefonato** tre t<sub>i</sub>  
speaking of customers ONES<sub>i</sub> have phoned three t<sub>i</sub>  
‘Speaking of customers, three called.’
- b. \*Parlando di clienti<sub>i</sub>, ne<sub>i</sub> ho parlato **con** tre t<sub>i</sub>.  
speaking of customers ONES<sub>i</sub> I.have spoken with three t<sub>i</sub>  
‘Speaking of customers, I spoke with three.’
- c. \*Quanto ai pacchi, ne<sub>i</sub> ho applicato l’ etichetta **a** tre t<sub>i</sub>.  
as for packages, ONES<sub>i</sub> I.have applied the tag to three t<sub>i</sub>  
‘Speaking of packages, I applied their tag to three.’
- d. \*Quanto ai bimbi, ne<sub>i</sub> ho consegnato **ciascuno** t<sub>i</sub> a sua madre.  
as for.the kids, ONES<sub>i</sub> I.have delivered each t<sub>i</sub> to his mum  
‘Apropos kids, I delivered each one to his mother.’

What happens when *ne* is dropped? While we did not gather this data from a larger pool of native speakers, our intuitions are that (i) the *ne*-blocking cases in (73) are often grammatical without *ne*; (ii) some NDPs are not forced to have a [+HUMAN] interpretation (e.g. (74b), modeled on (73c)); (iii) if a previous set is provided, the DL reading is perfectly possible in the PP cases, see (74). (74a) directly contrasts with (68) above.

- (74) a. Sono arrivati [quattro turisti]<sub>i</sub>. Ho già parlato **con** [due<sub>j⊂i</sub>].  
are arrived [four tourists]<sub>i</sub> I.have already spoken with two<sub>j⊂i</sub>  
‘[Four tourists]<sub>i</sub> have arrived. I already spoke with two<sub>j⊂i</sub>’
- b. [Dieci pacchi]<sub>i</sub> da fare. Ho già applicato l’ etichetta **a** sei<sub>j⊂i</sub>.  
[ten packages]<sub>i</sub> to make I.have already applied the tag to six
- (75) \*[Dieci pacchi]<sub>i</sub> da fare. Hanno già l’ etichetta sei<sub>j⊂i</sub>.  
[ten packages]<sub>i</sub> to make have<sub>PL</sub> already the tag six  
‘Ten packages to do. Six already have their tag’

The judgments for the distributive case in (73d) are less sharp: DL seems possible removing *ne*, but the sentence is not perfect. Without *ne*, the post-V NDPs with

unergatives seen in (73a) remain non D-Linked and [+HUMAN], hence the deviance of (75). Interesting, Italian has a trick up its sleeves to get the DL meaning, modelled after (74): it uses a special preposition *in*, which embeds the post-V subjects of an unergative verb and makes DL readings available again (76).

- (76) Ieri sono arrivati [quattro turisti]<sub>i</sub>. Oggi hanno chiamato ??(in) due<sub>j⊂i</sub>.  
 yesterday are arrived [four tourists]<sub>i</sub> today have called (in) two<sub>j⊂i</sub>  
 ‘Four tourists arrived yesterday. Today two called.’ (lit. ‘they called in two’)

The DL reading of those quantifier that have nominal restrictions (right column in Table 3 above) remain impossible at all time. Unsurprisingly, these quantifiers all disallow *ne*.

What can be concluded from this data? A compact way to express the situation is (77).

- (77) To have an anaphoric reading in a DP of the form [DP Q NP]:  
 a. leaving the NP phonetically null is a last-resort option;  
 b. to obtain a DL reading for the DP in Italian, Q must allow overt partitives

*Ne* is a way to avoid a completely null restriction (the NP is replaced by a copy/trace, which is in turn linked to the overt element *ne*, compatible with a partitive for reasons discussed in §4). In Italian, merging [+HUMAN] features is a second way of avoiding completely empty restrictions. A third solution is merging morphemes like *-thing* or *-body* in English, yielding *everything*, *everybody*. The latter two ways are incompatible with a partitive structure, so the D-Linked interpretation is blocked and the only option to achieve the same effect is a contextual restriction, with the limits discusses in §6.1. Finally, there are cases where the *ne* strategy is structurally unavailable ((73): NDP in pre-V subject position, or embedded under a PP or with strong Qs) and the [+HUMAN] features yields an unwanted semantics. In these cases, NP elision is carried out *in situ*, and the D-Linked reading is available. The fact that this is a last resort option does not mean that adopting it gives raise to partial or total deviance: subject NDPs are perfectly fine, and so are the examples in (74). The situation seems particularly suitable to be modeled in an optimality-theoretic framework (Legendre et al., 2001; Steddy & Samek-Lodovici, 2011), where lower-ranked constraints (here, avoiding empty NPs) can be violated to satisfy higher-ranked constraints (obtaining a DL semantics). We leave an attempt to carry out an analysis along these lines to another occasion.

The case of unergatives, ((76), without *in*), remains at this point unaccounted for: if they truly block *ne* they should allow DL readings in the absence of *ne* just as well as (74). However, it should be noted that the ungrammaticality of *ne* with unergatives (73a) is much more nuanced than other cases. The acquisition of reliable graded judgments from a pool of speakers could be the key to understand the real nature of this difference.

## 7. Conclusions

In this paper we have explored the conditions for referring to an *antecedent superset* — so-called *Discourse Linking*, a phenomenon which has been addressed by means of a more elaborate system of indexes (see Enç 1991), and used as a tool to classify the behaviour

of different types of *wh*-elements: from the D-Linked *which* to the ‘aggressively non-D-Linked’ *who the hell!* (Pesetsky 1987). Our take was different. We did not focus on *wh*-elements or on examples like (78), though we believe that our analysis can be easily extended to these elements.<sup>19</sup>

- (78) Four people have just arrived. {Which one / How many / Who / Who the hell} speak(s) Italian?

We looked instead at the factors that give rise to the presence or to the absence of the DL reading across a range of ‘determiners’, some of which (in particular, proportions) have not received a lot of attention. The results show a complex picture, especially in post-V position. When the two languages under consideration diverged (as with the nDL reading of post-V *half*), we tried to confirm the discrepancy with pools of informants and statistical tests, aiming for an account in terms of independently motivated features or constructions in the two languages.

One limit of the present study is of course the number of languages under consideration. Some languages, e.g. Hungarian, seem to mark different readings of NDPs with specific suffixes (A. Tamm, p.c.). A study of the range of determiners that can bear such suffixes could be a way to probe the generality of the analysis we have adopted for (overt) partitives. A comparison with French, which has an NP-proform similar to the Italian *ne*, would also be highly relevant. We leave these extensions for future investigations.

## Abbreviations

ACC = accusative, ADJ = adjective, ART = article, D = determiner, DEF = definite, DP = determiner phrase, DL = D-linked, F = feminine, GEN = genitive, M = masculine, MEASP = measure phrase, NOM = nominative, NDL = non D-linked, NP = noun phrase, NUM = numeral, NUMP = numeral phrase, OBJ = object, PRED = predicate, P = preposition, PL = plural, PP = prepositional phrase, Q = quantifier, RC = relative clause, SG = singular, SBJ = subject, V = verb, VP = verb phrase

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<sup>19</sup> See *which one of these people*, *How many of these people*, *who of these people* vs. *\*what of these things* *\*Who the hell of these people*.

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