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Gathered solutions from *numerous* problems: Anti-monotonicity, restrictiveness, star operators*

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Abstract. In this paper we study the different patterns that *gather*-like and *numerous*-like predicates present in restrictive relative clauses. Restrictive relative clauses represents a novel case in which the two types of collective predicates differ, alongside the known cases involving proportional quantifiers and non-proportional partitive constructions. The first part of the solution provides an explanation on why *numerous* is generally bad in restrictive relative clauses. Since *numerous* is monotonic with respect to the parthood relation of plurals, any attempt of restriction will end up including the maximal element of the complete join semilattice, which is the sum of all the atoms. This results in triviality, since each member of the predicate that should be restricted is part of at least one *numerous* plural individual. The second part of the solution provides an analysis on why restrictive *numerous* is fine if it applies to complex predicates like *gather students*. Exploiting syntactic theories of pluralization, we argue that when the star operator is absent from *gather*, it can modify a plural predicate without preserving the complete join semilattice and this allows restriction by *numerous*.

1 Introduction

The present paper aims at providing an analysis to some puzzles linked to restrictive uses of *gather*(-like) and *numerous*(-like) predicates. The first puzzle rises from the contrast shown by the following sentences:[1]

(1) a. Jack only talked to the students that gathered.
b. #Jack only talked to the students that were numerous.

* The main examples and the problems they constitute, together with important suggestions toward a solution, were proposed by Martin Hackl in a problem set for the course 'Introduction to Semantics'. I would like to thank Keely New, Jad Wehbe, Dean McHugh, Patrick Elliott, and three anonymous reviewers for crucial feedback that helped seeing the puzzle from a different perspective and reshaping the analysis accordingly. Thanks also to all the participants to Martin's and Patrick's course for feedback on an early version of this work.

[1] All our examples include *only* in the attempt to make sure that the relative clause is interpreted as a restrictive relative clause.

Whereas (1a) is a felicitous sentence in which the predicate *students* has been modified by *gathered* by means of a relative clause, (1b) – the result of substituting the predicate *gather* with *be numerous* – is somehow deviant.[2] A preliminary question we have to ask is whether the general infelicity of restrictive relative clauses involving the predicate *numerous* is specific to relative clauses or is actually linked to restrictiveness *per se*. With respect to this issue, the following data from Italian is particularly helpful:

(2) a.

Ho	parlato	con	i	numerosi	studenti.
have.1SG	talked	with	the.PL	numerous.PL	student.PL

I have talked with the numerous students.

b. ??

Ho	parlato	con	gli	studenti	numerosi.
have.1SG	talked	with	the.PL	student.PL	numerous.PL

I have talked with the numerous students.

The minimal pair above exploits a typical Romance phenomenon: modifiers in pre-nominal positions are linked to non-restrictive interpretations, while post-nominal modifiers are ambiguous between the two readings (Cinque, 2003; Morzycki, 2008).[3] The contrast between (2a) and (2b) signals then that the infelicity of the predicate *essere numeroso* / *to be numerous* is really tied to restrictive interpretations in general, rather than limited to (restrictive) relative clauses. There must be something that blocks *numerous* from being restrictive, namely from selecting a specific subset of a given set.

The contrast observed in (1) becomes even more compelling when compared with the second puzzle we will discuss, which arises from the following pair:

(3) a. Jack only talked to the numerous students that gathered.
b. Jack only talked to the gathered students that were numerous.

In (3a), as in (2a) before, we see that indeed *numerous* can be used in non-restrictive attributive position, and this does not interfere with the felicity of the *gather*-relative clause. On the other hand, more crucial data is provided by (3b): *numerous*-restrictive relative clauses can be felicitous; in particular, they are perfectly fine if the predicate they combine with is a complex predicate, in our case if *student* has already been modified by some other predicate, *gather*. We will see that being a complex predicate is not enough to be restricted by *numerous* and that only predicates with a specific internal structure will work.

[2] There are some speakers that manage to make (1b) acceptable 'imagining a scenario in which there are different groups of students'. This intuition, connected to our second puzzle, is consistent with our analysis and we will get back to it in section §3.

[3] Crucially, we do not commit here to any specific syntactic or semantic analysis of the contrast between the two interpretation, beyond the idea that restrictive interpretations select for a subset of the predicate they combine with.

To summarize the goal of this paper, we can take away two main observations and two questions, respectively, from the examples presented insofar:

1. the modifier *numerous* is generally fine as non-restrictive but not as restrictive;
   what is preventing him from being restrictive?
2. there exist cases in which *numerous* is fine in restrictive position;
   what is the difference with the other cases?

To answer the first question we will recall the *anti-monotonicity constraint* proposed in Amiraz (2021). We will see how this constraint can be said to play a role in relative clauses and how it is deeply rooted in the properties of the complete join semilattice structure of plurals. The analysis will show that whenever a predicate P is monotonic with respect to the dimension of the parthood relation in the semilattice, any possible restriction is blocked, since $P(x)$, for any element x in the lattice, would entail $P(m)$, where m is the maximal element of the lattice. The answer to the second question will be built on the intuition that (3b) involves several groups of gathered student. We will argue that while most complex predicate (like *smiling students*) preserve a complete join semilattice structure, others (like *gathered students*) have the possibility to not preserve it. In particular, we will claim that *gathered* changes the complete join semilattice structure of *students* when it is not pluralized. We will assume that pluralization comes from a syntactic operator, the star operator, in line with Sternefeld (1998) and Beck and Sauerland (2000), and that it could be absent. Let us now start from an introduction of the relevant properties of *gather*-like and *numerous*-like predicates that we will borrow from the existing literature to provide an analysis to our puzzles.

2 *Gather* and *be numerous*, properties and constraints

2.1 Relevant properties of *gather* and *be numerous*

Both *gather* and *be numerous* can be classified as collective predicates, for they only accept plural individuals in their domain. However, it has been known for a while now that a more fine-grained distinction is needed within the class of collective predicates, since *gather* and *numerous* give rise to different patterns when combined with plural quantifiers (Champollion, 2010; Dowty et al., 1987; Kroch, 1974). These patterns resemble the contrast we presented in (1), since only so-called *gather*-type predicates can felicitously combine with plural quantifiers, as displayed in (4) and (5).

(4) a. All the students gathered.
    b. #All the students are numerous.

(5) a. Most of the students gathered.

b. #Most of the students are numerous.

A couple of intuitions on the properties that are linked to this problem are generally shared by the literature, and, following Kuhn (2020), they can be summarized as follows:

1. *numerous*-like predicates denote properties of groups as such;
2. *gather*-like predicates license 'distributive sub-entailments'.

Property 1 states that *numerous*-like predicates do not hold (or are not guaranteed to hold) for subparts of what they are predicated of. Moreover, it has to be pointed out that most of these predicates are 'blind to differences', meaning that they cannot distinguish whether a certain atom instead of another is in the plurality they are predicated of. Take for example the case of *numerous*: it does not care about the singular atoms belonging to the plurality it is predicated of, it only cares that such plurality has a certain cardinality, regardless of the particular members that make it up. To say that $a \oplus b$ constitutes a *numerous* plurality, we are not concerned with any of the properties of a and b, it suffices to say that the plurality $a \oplus b$ exists, i.e. we are only interested in the fact that we can group a and b together. For instance, if we substituted a with c, the numerosity of the plural individual would not change, and we will see in section §3 how these properties play a crucial role in blocking restrictive interpretations.

With respect to property 2, Kuhn (2020) traces back the distinction between the two classes of collective predicates to a mass/count distinction. In particular, in the same way every part of something that is water is water itself, *gather*-like predicates have the crucial property of holding for any plural subpart of the individual they are predicated of.

Definition 1 (Distributive sub-entailments)**.** If a predicate holds for a plurality x, then it holds for any y s.t. $y \leq x$ and $\neg Atom(y)$.[4]

The general idea of 'distributive sub-entailments' was first proposed in Dowty et al. (1987) and Kuhn improves the analysis to account for several over and undergenerations. Within an event-semantics framework, Kuhn says that a *gathering* event is formed by *gathering* sub-events for any non-atomic individual. On the contrary, 'it is impossible to divide a *numerous* event into small parts, each of which is still a *numerous* event' (Kuhn, 2020). However, here we are interested in the reverse property, mentioned *en passant* by Kuhn (2020). In the case of distributive predicates 'if a predicate holds of x and holds of y, then it also holds for the sum of x and y'; 'in contrast, *gather*-type predicates do not have this

[4] Since a minimal plurality (a 'sufficiently large subpart' (Kuhn, 2020)) is always needed as the smaller individual for which a collective predicate can hold, the term '(ε-)bounded divisiveness' is also used in the literature. A predicate P has ε-bounded divisiveness iff 'If P holds of x, then P holds of all sufficiently large parts of x' (where the 'sufficiently large' is defined by a value ε).

property' (Kuhn, 2020). If all the girls smiled and all the boys smiled, the sentence *The girls and the boys smiled* has only a true reading. On the other hand, if all the girls gathered in one room and all the boys gathered in another, there is at least a false reading for the sentence *The girls and the boys gathered*.[5] The answer to our second puzzle will be due to this property. As can be deducted from few lines above, the answer to the first puzzle is instead related to the fact that *numerous* displays the opposite property, presenting a behaviour akin to distributive predicates: if *numerous* holds of x and holds of y, *a fortiori* it also holds for $x \oplus y$.

2.2 Amiraz (2021) and his *anti-monotonicity* constraint

Kuhn's approach, which we don't discuss here for the sake of space, has been accused of undergeneration by Amiraz (2021). In his paper, Amiraz pairs proportional quantifiers (6a) with non-proportional partitive constructions (6b):

(6) a. All the students are tall/#numerous.
b. Forty of the students are tall/#numerous.

These two cases are grouped under the label of 'partitive quantifiers', where 'a partitive quantifier denotes a (possibly trivial) partition or set of partitions of A into objects that are in B and objects that are not in B' (Amiraz, 2021). Long story short, Amiraz's idea is that a predicate can appear in predicative position of partitive constructions only if it can give rise to a well-formed partition and that *numerous* fails in forming one.[6] One simple option for us, could be extending Amiraz's (2021) account to our puzzle assuming that restrictive relative clauses, and restrictive modifications in general, are (similar to) partitive quantifiers. Consider a sentence like:

(7) I know the names of the people that cheated during the exam.

[5] See Winter's (2002) discussion on the ambiguity of the sentence 'All the committees met'.

[6] As we said in the previous section, and as we will clarify later, most *numerous*-like predicates are 'blind to differences', in the sense that they hold for a group as such, most of them only by virtue of the cardinality/proportion of the group. This implies a sort of *liquidity* of *numerous*-like predicates. Given a certain set, several different subsets of that set can be formed and be described as *numerous* because only the number of the elements in these subsets matters to satisfy the property. This means that given a set S, in set terms, or an individual x, in mereological terms, we can find at least two covers C_1, C_2 for which $C_1/\sim_P$ and $C_2/\sim_P$ are defined for $P =$ *be numerous* but for which $\bigoplus C_{1_{|P}} \neq \bigoplus C_{2_{|P}}$ (where $C_1/\sim_P$ is the partition of C_1 into the subset of elements in P, namely $(C_{1_{|P}})$, and the subset of elements not in P, namely $(C_{1_{|P^c}})$.). But this clearly goes against the definition of well-formed partition in Amiraz (2021), showing that *numerous* cannot give rise to a well formed partition, and thus cannot be felicitously used with partitive quantifiers.

Intuitively, the restrictive relative clause introduces two groups of people, those that cheated during the exam and those that did not. These two groups are of course introduced in different ways. The group of people that cheated is introduced positively, or directly, and it is therefore a salient group to which the speaker can refer back. On the other hand, the group that did not cheat is introduced in an indirect (and thus less salient) way.[7] This is shown by (8), in which *They* can only refer to the people that cheated.

(8) I know the names of [the people that cheated during the exam]$_1$. They$_1$ will be punished.

Thus, one option to link our puzzles to Amiraz (2021) is to propose that relative clauses introduce partitions, where these partitions can possibly be trivial, i.e. constituted by one single subset, provided the fact that both the indirectly-introduced and the directly-introduced groups can be 'cancelled':

(9) a. I know the names of the people that cheated during the exam. Which means I know everyone's name, since all of you cheated.
$\rightsquigarrow \neg\exists x$(*x did not cheat*)

b. I only know the names of the people that cheated during the exam. Which means I know nobody's name, since none of you cheated.
$\rightsquigarrow \neg\exists x$(*x cheated*)

For these reasons, restrictive relative clauses can be regarded as sort of 'partitive quantifiers', since *the As that (are) B* 'denotes a (possibly trivial) partition or set of partitions of A into objects that are in B and objects that are not in B', recalling again the definition by Amiraz (2021) from the previous lines. The answer to our first puzzle, the infelicity of restrictive *numerous*, would be linked to its failure in giving rise to a well-formed partition. On the other hand, modifying *students* with *gathered* would provide a uniquely salient cover, namely the various groups of students that gathered together. This would avoid the problem described in footnote 7, and would create a good environment for *numerous* to define a well-formed partition. However, this explanation would now create a new problem for Amiraz (2021). Consider the following:

(10) a. ??All the gathered students are numerous.
b. #Forty of the gathered students are numerous.

Even though (10a) and (10b) feature *gather* in attributive position and *numerous* in predicative position, exactly like (3b), they are infelicitous. This is not expected if we just assume the puzzle to be solved by the fact that *gathered students* gives rise to a uniquely salient cover to which *numerous* applies.

For this problem, we will limit ourselves to the relative clauses cases in search for a simpler explanation, that might indeed be linked to the partition idea even

[7] Possibly as an implicature, as an anonymous reviewer suggested.

though we leave the study of the compatibility between the approaches to future work. Our explanation begins from the inquiry into how *numerous* interact with the structures used to model plurals. However, precisely for this reason, the empirical observation constituting the basis for Amiraz (2021) makes a perfect starting point for us. This crucial empirical generalization states that certain predicates obey the non-monotonicity constraint, defined by Amiraz as follows:

Definition 2 (The non-monotonicity constraint)**.** A gradable predicate can co-occur with a partitive quantifier if and only if the dimension of the predicate is non-monotonic with respect to the dimension of the partitive quantifier.

(Amiraz, 2021)

In the next section, we will explain why and how this constraint plays a role in restrictive modification in the case of *numerous*.[8]

3 The analysis, starring: most verbs but not *gather*

3.1 If anything, non-restrictiveness

Recall our initial example (1b), repeated here as (11):

(11) Jack only talked to the students that gathered.

In this section, we aim at providing an explanation on why *numerous* cannot receive restrictive interpretations. The explanation we provide can be seen as a complement to Amiraz's analysis, namely: *numerous* cannot give rise to a well-formed partition because it generally fails in restricting a predicate. Our explanation shows that this failure is tied to the nature of the predicate *numerous* and to the structure of plurals. In particular, whenever *numerous* tries to restrict a predicate, it inevitably ends up receiving a non-restrictive interpretation, which results in ungrammaticality whenever this interpretation cannot be derived by any parse of a given sentence. Consider the following denotation for *students*, with the traditional complete join semilattice structure used to analyse plurals due to Link (1987) (where the plural morpheme *-s* is the star operator[9]):

Consider then the following definition for *numerous*:

(12) $[\![numerous]\!]^{g_c} = \lambda x : x \in dom(|\ |).|x| \geq$ the contextually supplied numerosity standard

[8] When the parthood relation is the plural sum of individuals, but the very same analysis holds for *large* and other predicates in those cases in which the parthood relation is a part-whole one

[9] Where $^*h$ is the smallest function s.t. $\forall x[h(x) = 1 \rightarrow^* h(x) = 1]$ and $\forall x, y[^*h(x) =^* h(y) = 1 \rightarrow^* h(x \oplus y) = 1]$ (Martin Hackl, lecture notes).

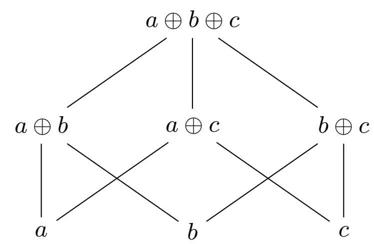

Fig. 1. $[\![\mathit{students}]\!]^{g_c} = \{a, b, c, a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c\}$

We can now pick an individual x such that its cardinality is exactly equal to the numerosity standard s, i.e. the smallest cardinality needed for *numerous* to hold. Now, it follows that the cardinality of any element strictly smaller than x will be below the numerosity standard. On the contrary, the cardinality of every element equal or bigger than x will be above the numerosity standard.

– $\forall y((|y| < |x|) \rightarrow (|y| < s))$
– $\forall z((|z| \geq |x|) \rightarrow (|z| \geq s))$

In other words, the contextually supplied numerosity standard sets a bar above which every individual is *numerous*. Specific cases in which the rules we just stated hold *a fortiori* are those cases in which y is a proper part of x or x is a part of z:

– $\forall y((y \prec x) \rightarrow (|y| < s))$
– $\forall z((z \succeq x) \rightarrow (|z| \geq s))$

In this sense, *to be numerous* is monotonic with respect to the parthood relation. Let's say that we have a very low numerosity standard, say 2, and we want to claim that $a \oplus b$ from the previous figure is a numerous individual. We wouldn't be able to hold that $a \oplus b$ is a numerous individual, without admitting that $a \oplus c$, $b \oplus c$, and $a \oplus b \oplus c$ are numerous individuals too. Again, any individual with cardinality above the standard bar has to be regarded as 'numerous'. This is exemplified by the next picture.

This is why restriction with *numerous* is (nearly) impossible. If an element of the semilattice is numerous, the maximal element of the semilattice is also numerous. Which means that there exist at least one numerous individual containing all the atoms. The definite article, assuming the following meaning adapted from Sharvy (1980), will then select the biggest individual that contains all the others, which will always be the maximal element of the complete semilattice.

(13) $[\![\mathit{the}]\!]^{g_c} = \lambda F : F_{\langle e,t\rangle} \& \exists x[F(x) \& \forall y[F(y) \rightarrow y \preceq x].\iota z[F(z) \& \forall y[F(y) \rightarrow y \preceq z]$

(14) $[\![\mathit{the\ numerous\ students}]\!]^{g_c} = a \oplus b \oplus c$

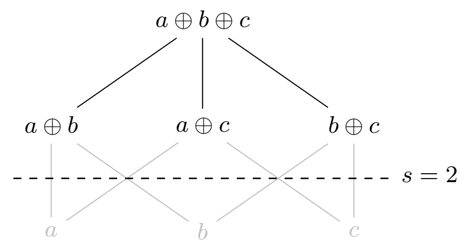

Fig. 2. $[\![\textit{numerous students}]\!]^{g_c} = \{a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c\}$

In the light of the above, it is clear why *numerous* can (almost) only receive non-restrictive interpretations: because any attempt of restriction will end up in attributing the property to the entire plurality.

Recall now Amiraz's (2021) monotonicity constraint stating that 'a gradable predicate can co-occur with a partitive quantifier if and only if the dimension of the predicate is non-monotonic with respect to the dimension of the partitive quantifier'. It should now be clear why this is the case in general and specifically for our puzzle: because of its meaning, *numerous* is monotonic with respect to the structure of plurals and restriction will always end up including the maximal element, meaning that for all x, exists a y such that y is numerous and $x \preceq y$.

3.2 Structural modifications

Recall now (3b), the example giving rise to our second puzzle, repeated here as (15):

(15) Jack only talked to the gathered students that were numerous.

When people are asked on the meaning of this sentence, they report a scenario in which there are two or more groups of gathered students and some of these groups are numerous while others are not. Those who can accept (1b), repeated here as (16) without the hash mark, imagine a similar scenario:

(16) Jack only talked to the students that were numerous.

The ability to use *numerous* restrictively seems therefore tied to the possibility of individuating several groups, and later creating a subset containing those for which the predicate holds. This readings is similar to what happens when *numerous* (felicitously!) restricts collective nouns:

(17) We organized a school party only for the classes that are numerous.[10]

[10] Some speakers don't like *be numerous* here, but it can be replaced with *be large in number*, which still gives rise to our main puzzle.

What has *gather students* in common with *classes*? What is the difference between *gather students* and other complex predicates? That only certain complex predicates would create structures that allow restrictive *numerous* follows from what we said in the previous section. Consider the following example.

(18) #Jack only talked to the smiling students that were numerous.

In this case *smiling students* behaves exactly like *students*: speakers judge (18) just as deviant as (1b), where *students* was unmodified. This is expected, since indeed there is no structural difference between a simple predicate like *students* and a complex predicate like *smiling students*. Consider the following scenario for *students*, *to smile* and, consequently, *students that smiled*:[11]

(19) a. $[\![*student]\!]^{g_c} = \{a, b, c, a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c\}$
b. $[\![*smile]\!]^{g_c} = \{a, b, d, a \oplus b, a \oplus d, b \oplus d, a \oplus b \oplus d\}$
c. $[\![students\ that\ smiled]\!]^{g_c} = \{a, b, a \oplus b\}$

Modifying *students* with a predicate like *smile* will always return a new semilattice, as (19c) shows. As a consequence, this new complex predicate will again run into the maximality problem described in section §3.1. Now, imagine instead to have a collective predicate that is not pluralized, i.e. that has in its denotation only the members for which it 'strictly' holds.[12] In the same way that a non-pluralized distributive predicate like *smile* would have in its denotation only the atomic individuals that smile, a predicate like *gather* would only have the groups that gathered together and their sub-entailments. For instance, if the students gathered in one room and the professors in another, the sum of students and professors won't be in the denotation of *gather*. Consider the following scenario where a, b, c, e and f are students that gathered in two groups: $a \oplus b \oplus c$ and $e \oplus f$:

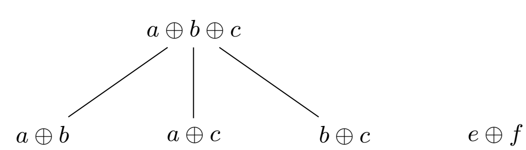

Fig. 3. $[\![gather]\!]^{g_c} = \{a \oplus b, a \oplus c, b \oplus c, e \oplus f, a \oplus b \oplus c\}$

As can be noticed, modifying *students* with *gather* does not give rise to a semilattice. In other words, modifications with unpluralized *gather*-like predi-

[11] Where *smile* is pluralized either via a syntactic operator, like the *operator we applied to *student-s*, (Beck and Sauerland, 2000; Sternefeld, 1998) or lexically (Kratzer, 2007; Krifka, 1992).

[12] See again Winter (2002) on 'All the committees met'.

cates is not semilattice preserving. As a consequence, the maximality problem with restrictive *numerous* does not arise. Take for example 3 as the contextually supplied cardinality necessary for *numerous* to hold. If we then apply *numerous* to the meaning of *gather* in Fig.3, the result will give us $a \oplus b \oplus c$ as the only numerous individual in the set. Since in this structure we have no greatest element $a \oplus b \oplus c \oplus e \oplus f$, the restriction manages to go through, selecting a numerous individual that leaves out $e \oplus f$ (together with its own sub-entailments).

Achieving this analysis is pretty straightforward if we adopt a theory of pluralization that employs a silent syntactic operator, in the style of Sternefeld (1998) and Beck and Sauerland (2000). Once the so-called star operator is omitted, *gather* is not pluralized and the result of the computation meets our desires. It might be the attempt to save the sentence that triggers a parse in which the operator is absent. The reason why *smile* cannot apply to the same resource is that it would end up having only atoms in its denotation. As a result, *smiling students* would also end up having only atoms in its denotation, which are not something *numerous* can hold for as a collective predicate. Thus, the syntactic structures we assume are those in Figure 4 in the next page. On the other hand, integrating our solution with lexical approaches to pluralization, such as Kratzer (2007) or Krifka (1992), would be less economical, since we would be forced to assume that certain predicates are ambiguous between a pluralized and a non-pluralized meaning. In the future, we think it would be interesting to explore how a solution in our direction could be achieved through the main approaches to so-called complex plural: covers (Schwarzschild, 1996) and groups (Landman, 1989). On the one hand, the covers approach might explain easily the difference between *Jack only talked to the gathered students that were numerous* and *#Jack only talked to the students that were numerous* and why some people might save the latter, imagining a scenario with different groups of students. *Gathered students* provides a uniquely salient cover to the students, namely the various groups that gathered, while *students* alone has no salient cover. A suitable context might however provide such cover and *students* could also be divided into different groups. On the other hand, this approach might face some difficulties in accounting for how relative clauses compose with covers instead of 'pure' meanings. The groups approach could give reasons for why *gathered students* patterns with collective nouns like *classes*, as shown in (17) reported here as (20).

(20) We organized a school party only for the classes that are numerous.

Unfortunately, this approach would also have to explain why they behave differently with partitive quantifiers, which is the very same problem we raised in section §2 in the hypothesis of extending the solution of Amiraz (2021) to our puzzle:

(21) a. ??All the gathered students are numerous.

b. All the classes in this school are numerous.

(22) a. #Forty of the gathered students are numerous.
b. Forty of the classes in this school are numerous.

In the light of what we just said we believe studying these contrasts under different perspective can shed light on the curious properties of these predicates, and we have a sense that a combination of our solution with the approach in Kuhn (2020) might solve this issue, together with some overgeneration problems intrinsic to Kuhn's theory (Amiraz, 2021; Kuhn, 2020). We will now move on to the final section, in which we will summarise the content of the paper and we will propose a couple of other ideas for future research.

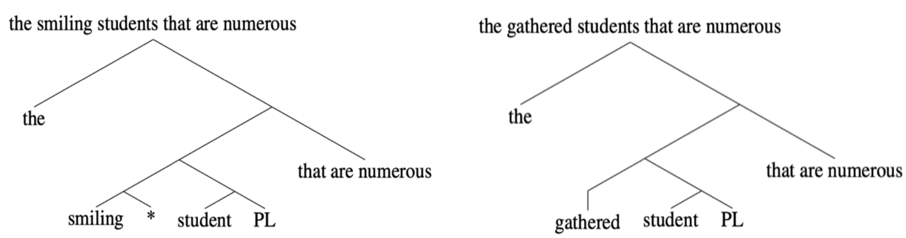

Fig. 4. The syntactic structures assumed in our solution

4 Conclusions and Future Work

In this paper we have provided an explanation and an analysis to the puzzles raised by the following sentences:

(23) a. #Jack only talked to the students that were numerous.
b. Jack only talked to the gathered students that were numerous.

After a brief introduction in section §1, in section §2 we reviewed some of the crucial properties of so-called *gather*-like and *numerous*-like predicates we exploited in our analysis. In §2.2, we have introduced the anti-monotonicity constraint, presented in Amiraz (2021). Section §3 presented our analysis to the issues raised by (23). In section §3.1 we have shown the relevance of the anti-monotonicity constraint in the complete join semilattice structure generally employed to account for plurals. In particular, we have demonstrated that *numerous* can only receive non-restrictive interpretations if it applies to such structures and this is causing the infelicity of (23a). In §3.2 we have argued that *numerous* does not run into this problem in (23b), if we assume a non-pluralized meaning for *gathered students*. Therefore, we proposed to follow syntactic theories of pluralized predicates (Beck and Sauerland, 2000; Sternefeld, 1998), since the desired meaning would be achieved simply by the absence of the star-operator. We concluded mentioning possible further extension of this study in complex-plurals frameworks, such as the covers framework of Schwarzschild (1996) or the groups framework of Landman (1989), which could account for the nested meaning of *gathere students*. On these lines, we should also provide a refined meaning for the definite article *the*, since the one we provided in (13) would not be able to combine with a non-pluralized meaning of *gathered students that are numerous* in cases in which there are several numerous groups of students but no maximal group including all the individuals in these groups.[13] Apart from these themes, we foresee future developments of this work in two directions. On the theoretical side, we would like to deeply study how our proposal can combine with Kuhn (2020) and Amiraz (2021), respectively, to tackle the issues that *numerous*-like predicates raise in the realm of partitive quantifiers. On the experimental side, as an anonymous reviewer suggested, it could be interesting to set up experiments that evaluate the percentage and conditions of acceptance of the sentences we discussed in this paper, as well as the grammaticality of *numerous* combined with both singular and plural collective nouns.

To conclude, we hope that the observations made in the present paper help understanding the behavior, and the subsequent analysis, of *gather*-like and *numerous*-like predicates in restrictive relative clauses, opening some windows to approach the various peculiar questions raised by these predicates, that are definitely numerous.

[13] A possible solution could be assuming a star operator combining with *gathered students that are numerous* to pluralize it.

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