

Subject-Verb Agreement Alternations in Spanish Pseudopartitive Constructions: A Corpus Study

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Abstract

Pseudopartitive constructions, following the format N1-*of*-N2 (such as *a group of students*), are known to feature alternations in their subject-verb agreement patterns, either with the N1 or the N2. Through a Spanish corpus analysis, this study investigates the possibility of a correlation between the choice of N1/N2 as an agreement trigger and the semantic type of the N1, as well as the animacy status of the N2. Although a positive correlation was found for N1 semantic type, no statistically significant results emerged for N2 animacy.

1 Introduction

The present paper deals with subject-verb agreement alternations in pseudopartitive constructions in Spanish. Pseudopartitive constructions—such as *a group of students*—are structures of the form N1-*of*-N2, where a bare noun phrase (N2; *students*) is quantified or measured by a noun functioning as N1 (*group*), typically denoting quantity, collectivity, or containment (Milner, 1978; Schwarzschild, 2006). Although this description is based on English, analogous structures exist cross-linguistically, including in German (Grestenberger, 2015), Romanian (Cornilescu, 2009), Finnish (Huomo, 2018), Hebrew (Shatil, 2015), and Spanish (Demonte and Pérez Jiménez, 2015). These constructions contrast with partitive structures, where the N1 selects a subset out of a specific set, which is preceded by a determiner (Chierchia, 1998; Zamparelli, 2008).

At a first glance, pseudopartitive constructions may seem indistinguishable from other (det)-N1-*of*-N2 genitive structures—such as *a portrait of*

children—since both follow the same sequence of word classes. However, one key distinction is that pseudopartitive constructions are known to feature two different verb agreement patterns: 1. with the N1; or 2. with the embedded N2 (Foppolo et al., 2023). See (1) for an example in which subject-verb agreement is possible either with the N1 (*group*) or the N2 (*researchers*).

- (1) a. A group of researchers is analyzing this phenomenon.
b. A group of researchers are analyzing this phenomenon.

The present study investigates the possibility of a correlation between the choice for either N1 or N2 subject-verb agreement and the semantic type of the N1; and between the choice for either N1 or N2 subject-verb agreement and N2 animacy. It does so through the analysis of 1,200 occurrences of pseudopartitive subject-verb agreement in subject position, present in the Spanish-language esTenTen18 corpus (Kilgarriff and Renau, 2013), available on Sketch Engine (Kilgarriff et al., 2014). Even though previous studies have been conducted to test for a correlation between N1/N2 choice for agreement and the semantic type of the N1 (Demonte and Pérez Jiménez, 2017; Foppolo et al., 2023), no studies have analyzed the role of N2 features in pseudopartitive agreement.

As stated previously, the possibility of dual agreement sets pseudopartitive constructions apart from other superficially similar N1-*of*-N2 sequences. An example showing the impossibility of dual agreement in other seemingly equivalent English N1-*of*-N2 constructions is provided in (2) below. Even though native speakers might produce a sentence like that of (2b), these

instances are considered errors in the psycholinguistic literature, deeming them as cases of agreement attraction (Foppolo et al., 2023).

- (2) a. The portrait of children looks beautiful.
- b. *The portrait of children look beautiful.

(Pseudo)partitive dual agreement has been explained in terms of structural ambiguity (Selkirk, 1977; Pesetsky, 1982; Franks, 1994), and, more recently, in terms of feature behavior across constituents (Wechsler and Zlatić, 2003; Danon, 2013). Dual agreement has also been attested for (pseudo)partitive constructions in Spanish (Demonte and Pérez Jiménez, 2017), Hebrew (Danon, 2011), Italian (Foppolo et al., 2023), Greek (Stavrou, 2003), and other languages. See (3) for an example in Spanish.

- (3) a. Un grupo de investigadores está analizando este fenómeno.
 A group.SG of researchers.PL is.SG analyzing this phenomenon.
 “A group of researchers is analyzing this phenomenon.”
- b. Un grupo de investigadores están analizando este fenómeno.
 A group.SG of researchers.PL are.PL analyzing this phenomenon.
 “A group of researchers are analyzing this phenomenon.”

Quantitative studies in the literature have suggested a correlation between subject-verb agreement and the semantic properties of the N1 in pseudopartitive constructions. In a series of three experiments in Italian—including acceptability judgments, production tasks, and eye-tracking—Foppolo et al. (2023) observed that N2 agreement was more likely when the N1 was interpreted primarily as a unit of measurement. For instance, quantifier N1s, which tend to facilitate the sole interpretation of measuring the N2 (e.g., *a lot of students*), tend to display a more balanced distribution in agreement patterns. On the other hand, N1s that have an independent referential meaning (e.g., *a box of chocolates*, in which *box* could denote a unit of measure and an actual cardboard box) strongly favor N1 agreement. Based on their findings, the authors proposed a semantic hierarchy reflecting how easily each semantic type of N1 supports a measure reading: containers allow it the least,

followed by collectives, while quantifiers allow it the most.

Demonte and Pérez Jiménez (2015) conducted a corpus-based study of Spanish and observed that certain semantic types of N1s, which they termed “collective numeral nouns”—including expressions like *un centenar de* ‘hundreds of’ as well as “non-numerical items” like *un montón de* ‘a lot of’—tend to facilitate agreement with the embedded noun (N2). Moreover, the authors stated that what they termed “multiplying numeral nouns”—such as *el doble de* ‘double of’—tend to facilitate N2 agreement. In contrast, N1s categorized by them as “group nouns” (e.g., *un grupo de* ‘a group of,’ *una pila de* ‘a pile of’) and “fixed measure nouns” (e.g., *un kilo de* ‘a kilo of’) were found to favor agreement with the N1. Their data also showed that constructions headed by “container nouns” exclusively triggered N1 agreement. The authors further investigated whether subject-verb agreement was influenced by the type of determiner preceding the N1, or by the presence of adjectives modifying either noun. In both cases, they found no significant correlation.

The present study builds on prior research by adopting the three-way semantic categorization of N1s—container, collective, and quantifier—proposed by Foppolo et al. (2023), who used it to investigate agreement patterns in Italian pseudopartitive constructions. While this categorization was originally developed within a psycholinguistic framework, applying it to corpus data represents an innovative methodological extension. It allows for the comparison of findings across studies that use distinct methodologies while preserving theoretical consistency. In contrast, previous corpus-based research on Spanish pseudopartitives (such as Demonte and Pérez Jiménez, 2015) employed more fine-grained categorizations of N1s, which, while descriptively rich, pose challenges for cross-linguistic and cross-methodological replicability. By working with a smaller set of broader categories, the present study promotes comparability across languages and approaches. Moreover, corpus linguistics offers the advantage of enabling researchers to efficiently analyze hundreds or thousands of naturally occurring instances of the phenomenon in question.

Although prior studies have explored how N1 semantics may influence agreement patterns, no research to date has systematically examined whether N2 animacy plays a role in agreement alternations within pseudopartitive constructions—or, more broadly, whether any characteristics of the N2 can serve as predictors. Given that animacy is a well-established semantic feature influencing grammatical behavior across languages (Özsoy, 2009; Bresnan and Hay, 2008; Gámez and Vasilyeva, 2015; Bayanati and Toivonen, 2019; Rosenbach, 2008) and has been shown to affect language processing (Vihman and Nelson, 2019; Branigan, Pickering and Tanaka, 2008), it constitutes a strong starting point for investigating whether N2 features impact pseudopartitive agreement. The present study thus introduces a novel dimension by examining whether N2 animacy contributes to subject-verb agreement patterns in Spanish pseudopartitives.

2 Methodology

2.1 Materials

Part of the TenTen corpus family (Suchomel, 2020), esTenTen18 comprises approximately 16.9 billion words sourced from internet texts (Sketch Engine, 2025). It includes a broad range of materials representing both Peninsular and Latin American Spanish varieties with a wide variety of registers. esTenTen18 is tagged morphologically by FreeLing (Padró and Stanilovsky, 2012). Every word in the corpus is tagged based on its part-of-speech and, furthermore, on its morphological features.

2.2 Corpus Annotation Procedure

The N1s analyzed in this study fall into three semantic categories: container, collective, and quantifier. Within each semantic group, four N1s were selected, and for each one, 100 occurrences of subject-verb agreement in subject-position pseudopartitive constructions were annotated.

To account for irrelevant or incomplete results often returned by corpus queries, the first 200 randomized hits per noun were downloaded. Annotation proceeded until 100 valid subject-position tokens were obtained, with the remainder discarded to ensure equal representation across N1s. An example search is shown in (4), with (5) illustrating a specific query for the noun *porcentaje*

‘percentage.’ The list of N1s used to represent each semantic category was assembled based on the author’s intuition as a native speaker of Spanish, with the aim of capturing nouns that are most frequently used in pseudopartitive constructions. As this is an exploratory study, no corpus-based or frequency-driven selection criteria were applied; however, future work will employ a more rigorous and systematic approach to N1 selection. A complete list of the selected N1s by semantic category appears in Table 1.

(4) determiner + (any number of optional adjectives) + the N1 analyzed + (any number of optional adjectives) + the word *de* (“of”) + (any number of optional adjectives) + a random N2 (plural forms only) + (any number of optional adjectives) + a random verb

(5) <s> [tag="D.*"] [tag="A.*"]*
[word="porcentaje"] [tag="A.*"]*
[word="de"] [tag="A.*"]* [tag="N..P.*"]
[tag="A.*"]* [tag="V.*"]

Category	N1 analyzed
Container Nouns	<i>Bolsa</i> ‘bag’ <i>Caja</i> ‘box’ <i>Paquete</i> ‘package’/‘pack’ <i>Puñado</i> ‘handful’
Collective Nouns	<i>Grupo</i> ‘group’ <i>Equipo</i> ‘team’ <i>Pila</i> ‘pile’ <i>Conjunto</i> ‘set’
Quantifier Nouns	<i>Montón</i> ‘lot’ <i>Número</i> ‘number’ <i>Par</i> ‘pair’ <i>Porcentaje</i> ‘percentage’

Table 1. N1s analyzed per semantic category

Each occurrence was annotated in an Excel spreadsheet for two key parameters: agreement (N1 or N2) and the animacy of the N2. For agreement, the annotation was either “N1” or “N2,” with no ambiguity expected, as the N1 was always singular and the N2 was forced to be always plural. Given that Spanish verbs overtly mark number, the source of agreement can be identified with confidence. For N2 animacy, one of four categories was assigned: human, animal, collective, or inanimate. The “collective” category applies to entities such as groups, organizations or institutions. For example, in the

sentence *a group of hotels were built*, the noun *hotels* would be categorized as inanimate, referring to physical structures. In contrast, in *a group of hotels offers significant discounts*, *hotels* would be considered collective, as it denotes an organization acting as an agent offering the discounts. In the event of an ambiguous sentence, “inanimate” was used as the default label. Once all occurrences were annotated, descriptive and inferential statistical analyses were conducted in R (R Core Team, 2021) to identify patterns and test for statistical significance. A total of 1,200 annotated pseudopartitive constructions were analyzed, with 400 occurrences for each N1 semantic type.

3 Results and Implications

N1 semantic type was associated with clear differences in agreement patterns. The majority of constructions with collective and container N1s strongly favored agreement with the N1 (84.2% and 87%, respectively), while constructions with quantifier N1s displayed a more balanced distribution, with 54.5% N1 agreement and 45.5% N2 agreement. These results are summarized in Table 2, with a visual representation provided in Fig. 1.

N1 semantic type	N1 agr	N2 agr	Total	N1 agr (percentage)	N2 agr (percentage)
collective	337	63	400	84.2	15.8
container	348	52	400	87.0	13.0
quantifier	218	182	400	54.5	45.5

Table 2: Agreement by N1 semantic type

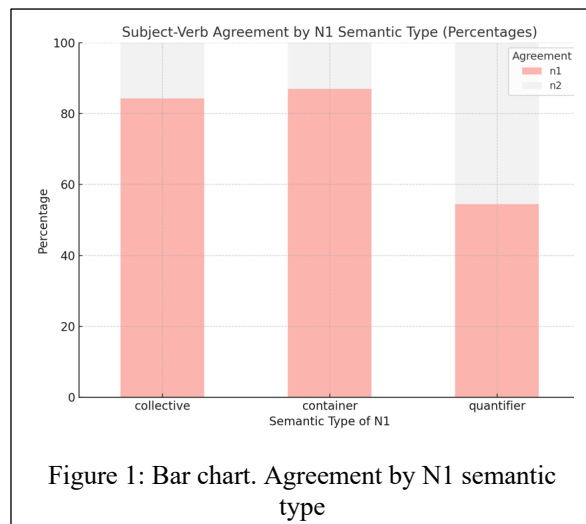


Figure 1: Bar chart. Agreement by N1 semantic type

With respect to N2 animacy, inanimate N2s showed the strongest tendency toward N1 agreement, with only 20.3% of cases exhibiting N2 agreement. Human and animal N2s behaved similarly to each other, showing N2 agreement in roughly 30% of cases (30.4% and 35.0%, respectively). The strongest tendency toward N2 agreement was observed with collective N2s, which displayed an almost even split between N1 and N2 agreement (48.7% vs. 51.3%). Full descriptive counts and percentages are presented in Table 3 and illustrated in Fig. 2.

N2 animacy	N1 agr	N2 agr	Total	N1 agr (percentage)	N2 agr (percentage)
animal	13	7	20	65.0	35.0
collective	19	20	39	48.7	51.3
human	263	115	378	69.6	30.4
inanimate	608	155	763	79.7	20.3

Table 3: Agreement by N2 animacy

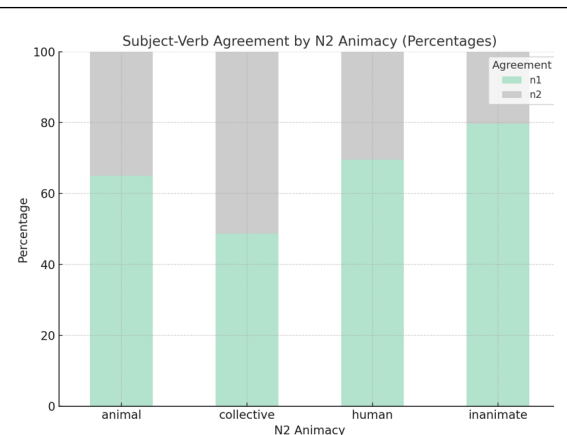


Figure 2: Bar chart. Agreement by N2 animacy

Two chi-square tests of independence were conducted to examine whether N1 semantic type and N2 animacy were associated with subject-verb agreement choice. A chi-square test of independence assesses whether two categorical variables are associated by comparing the actual frequencies observed in the data to the frequencies that would be expected if the variables were statistically independent. In the present study’s case, it tests whether the distribution of subject-verb agreement (N1 vs N2) depends on the semantic type of the N1 or the animacy of the N2. If the observed frequencies differ substantially from what would be expected under the

assumption of no relationship, the test produces a large chi-square value and a small p-value, indicating a significant association between the variables.

The first test revealed a strong and statistically significant association between the N1 semantic type variable and agreement, $\chi^2(2, N = 1200) = 139.52, p < .001$. This indicates that the semantic type of N1 used in the pseudopartitive construction significantly influenced whether the verb agreed with the N1 or N2. This effect appears to be largely driven by the higher rate of N2 agreement observed with quantifier N1s, compared to container and collective N1s (see Table 2). The second chi-square test found a weaker, but still statistically significant, association between the N2 animacy variable and agreement, $\chi^2(3, N = 1200) = 30.46, p < .001$. This suggests that the animacy status of the N2 (whether it referred to a human, animal, collective, or inanimate entity) had some influence on agreement patterns, though not as strong as the effect of N1 semantic type. This pattern appears to be driven in part by the relatively high N2 agreement rates observed for collective N2s (see Table 3).

To investigate which specific conditions influenced agreement patterns, a post-hoc binary logistic regression was conducted. While the earlier chi-square tests showed that both N1 semantic type and N2 animacy were associated with agreement, they could not identify which conditions within each variable were driving the effect. Logistic regression addresses this limitation by estimating the contribution of each condition to the likelihood of N2 agreement, while controlling for the other variable. This allows for testing whether particular conditions—quantifier, container, or collective N1s, and human, animal, collective, or inanimate N2s—significantly increase the probability of N2 agreement when other factors are held constant. In this study, the model predicted whether agreement occurred with the embedded noun (N2) or the head noun (N1), based on the values of the two variables.

The overall model was statistically significant, $\chi^2(5, N = 1200) = 154.4, p < .001$, indicating that the variables helped explain variation in agreement patterns. Among the individual conditions, only quantifier N1s had a statistically

significant effect. Compared to constructions with collective N1s, those with quantifier N1s were substantially more likely to show N2 agreement. The coefficient for quantifier N1s was 1.513 ($p < .001$), corresponding to an odds ratio of 4.54, calculated by exponentiating the coefficient. This means that, all else being equal, constructions headed by quantifier N1s were more than four times as likely to display N2 agreement. Container N1s did not differ significantly from collectives.

With respect to N2 animacy, none of the categories reached statistical significance in this model. However, the effect for collective N2s approached significance, showing a somewhat higher likelihood of N2 agreement than inanimate N2s, though this difference did not meet the conventional threshold for significance.

Predictor	Estimate (B)	Std. Error	z value	p value	Significance
(Intercept)	-1.606	0.5152	-3.117	0.00183	**
semantic type: container	-0.1464	0.2134	-0.686	0.49256	
semantic type: quantifier	1.513	0.1739	8.699	<2e-16	***
n2 animacy: collective	1.0466	0.6099	1.716	0.08617	†
n2 animacy: human	0.1474	0.5116	0.288	0.77332	
n2 animacy: inanimate	-0.3194	0.5064	-0.631	0.52821	

Table 4: Logistic regression results predicting the likelihood of N2 agreement

An additional model including the interaction between N1 semantic type and N2 animacy failed to converge meaningfully due to quasi-complete separation. Several N1-N2 combinations (e.g., container N1s paired with animal N2s) had zero or near-zero cases of N2 agreement, resulting in inflated standard errors and uninterpretable coefficients. As such, only the main effects model is reported.

The descriptive and inferential statistics replicated what was found by Foppolo et al. (2023), in the sense that quantifier N1s facilitated a more balanced distribution of N1/N2 agreement.

Therefore, the present study's results provide more evidence that semantic characteristics can accurately predict agreement patterns. Moreover, Foppolo et al. (2023) predicted and confirmed a gradient in agreement preferences based on the semantic type of the N1, with N2 (plural) agreement becoming increasingly acceptable from containers to collectives to quantifiers, reflecting the increasing accessibility of a measure construal. The present study replicated this gradient in Spanish to some extent: both descriptive statistics and logistic regression results show that quantifier N1s favored N2 agreement the most, followed by collectives, while containers showed the strongest preference for N1 agreement. However, collective N1s and container N1s feature only a three percent difference in descriptive statistics, and this small difference was not statistically significant in the inferential model. Hence, caution should be taken in this regard.

Although the descriptive statistics suggested a potential correlation between N2 animacy and subject-verb agreement patterns, the inferential analyses did not support this relationship. No statistically significant link was found between N2 animacy and the choice of N1 or N2 agreement. The present findings do not show a direct effect of animacy in the N2 and choice of N1/N2 subject-verb agreement in Spanish pseudopartitives. However, the role of animacy in this domain should not be ruled out at this point, with further studies needed to fully explore its potential influence.

4 Conclusion

In sum, this study contributes to the understanding of subject-verb agreement variation in Spanish pseudopartitive constructions by applying a corpus-based methodology informed by a replicable three-way categorization of N1s proposed by Foppolo et al. (2023). This approach facilitated cross-linguistic comparison and revealed that quantifier N1s significantly increased the likelihood of N2 agreement, a result supported by both descriptive statistics and logistic regression. While the overall order of agreement preferences—containers showing the least N2 agreement, collectives in the middle, and quantifiers the most—mirrored the gradient observed in Foppolo et al. (2023), the minimal

difference between container and collective N1s (just three percent) and the lack of a statistically significant difference between them suggest that the gradient is only partially replicated.

The study also explored N2 animacy as a novel predictor, but found no statistically significant correlation with agreement patterns. However, the question of whether certain characteristics of the N2 can predict N1/N2 agreement in Spanish pseudopartitive structures is not exhausted. Further studies should be conducted, analyzing other possible characteristics of the N2 that might facilitate one type of agreement over the other.

These findings reinforce the importance of N1 semantics in agreement variation and highlight the value of combining psycholinguistically informed frameworks with corpus-based methods. At the same time, they point to several directions for future research. As an exploratory study, this analysis focused on a limited set of twelve N1 nouns selected to represent three broad semantic categories. While this approach enabled clear comparisons across N1 types, it does not capture the full range of variation found in Spanish pseudopartitive constructions. Expanding the dataset and incorporating more ambiguous or marginal cases would allow for a more comprehensive understanding of the phenomenon.

To support this broader coverage, future work will adopt a more systematic approach to N1 selection, potentially drawing on corpus-based frequency data or cross-linguistic comparability measures. In parallel, greater attention should be given to the role of embedded noun features. While N1 semantics were categorized with reference to psycholinguistic literature, no equivalent framework was applied to N2 animacy. Adopting psycholinguistically grounded categories for N2s may help clarify their contribution to agreement patterns and support more robust cross-linguistic comparisons.

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