

# Degree Relatives and their kin

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## 1 Introduction

### • Degree Neuter Relatives

Spanish has a certain type of complex constructions involving a modified gradable predicate and the neuter definite determiner *lo*. These are called Degree Neuter Relatives, DNRs henceforth (Rivero 1981, Ojeda 1982).

(1) a. *Pedro es lo alto que era su padre*  
Pedro is D.NT tall.MS.SG that was his father.MS.SG  
'Pedro is as tall as his father was'

b. *La película no fue lo exitosa que fue la novela*  
D.FM.SG movie.FM.SG not be D.NT successful.FM.SG that was  
D.FM.SG novel.FM.SG  
'The movie wasn't as successful as the novel'

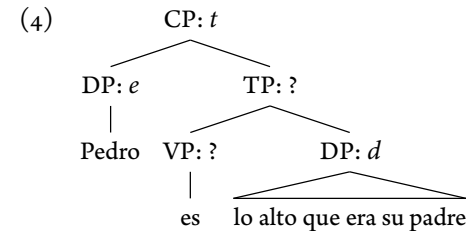
- DNRs uniformly give rise to a “degree” interpretation: (1a) conveys that Pedro is tall to the same degree/extent that his father was; (1b) conveys that the movie was not successful to the same extent that the novel was successful.
- Due to their degree-oriented interpretation, the consensus has long been that DNRs must be quantity denoting in “some capacity” (Plann 1980, Torrego 1988, Bosque and Moreno 1990).
- Drawing parallels with other constructions, such as comparatives and equatives, DNRs have later been modeled in formal semantic analyses as being of type  $d$  (Gutiérrez-Rexach 1999, 2014).

(2) a.  $\llbracket(1a)\rrbracket =$  Pedro is  $d$ -tall  
where  $d$  = the maximal degree  $d'$  to which Pedro is  $d'$ -tall.  
b.  $\llbracket(1b)\rrbracket =$  It is not the case that the movie was  $d$ -successful  
where  $d$  = the maximal degree  $d'$  to which the novel was  $d'$ -successful.

### • Features of interest

The focus is on two key aspects of DNRs that prompt the following two questions:

- ❶ In DNRs a neuter definite article is combining directly with a gradable adjective. How? Note that the counterparts in English are ungrammatical:
  - (3) a. \*Pedro is the tall that his father was.
  - b. \*The movie wasn't the successful that the novel was.
- ❷ DNRs appear in predicative positions. If DNRs denote maximal degrees, how does the semantic composition work?



### ✱ Goal

Propose an analysis of DNRs that resolves the two compositionality problems presented above and along the way explains the availability of DNRs in Spanish, but not in languages like English.

#### Key Ingredients of the Analysis

- Syntactically, DNRs are degree-denoting free relatives, which also exist in Spanish in other forms (and not restrictive relative clauses).
- Semantically, DNRs denote maximal degrees (in keeping with earlier analyses), which serve the role of a Degree Phrase in a larger Adjectival Phrase, part of which is elided under identity.

- **Roadmap**

§2: Present some basic facts about the distribution of DNRs in Spanish.

§3: Show that DNRs are a variety of degree free relatives.

§4: Show that DNRs must denote maximal degrees where maximality is contributed by *lo*.

§5: Argue that the composition puzzle in ② is resolved once we take into account the structural position of DNRs as occupying the Degree Phrase slot of an AP (e.g. as *six feet* in *six feet tall*).

§6: Conclusions and implications.

Appendix: Extension to Amount Relatives (Carlson 1977, a.o.).

## 2 Basic properties of DNRs

### ① Flexibility

It is possible to construct DNRs using predicates that belong to a variety of syntactic categories, as long as they are gradable.

- (5) a. *lo* { *rápidamente* / \**ayer* } *que llegó* ADVERBIAL  
D.NT rapidly yesterday that arrived  
'how {fast / \*yesterday} she arrived'
- b. *lo* { *niño* / \**historia* } *que es Mariano* NOMINAL  
D.NT child history that is Mariano  
'how{childish / \*history} is Mariano'
- c. *lo* { *en punto* / \**desde casa* } *que llegó* PREPOSITIONAL  
D.NT on point from home that arrived  
'how {punctually / \*from home} she arrived'

- In general, any predicate phrase that is coercible into a gradable interpretation is grammatical (Contreras 1973).

- (6) a. *lo* *Americano que se ha vuelto desde su viaje*  
D.NT American that refl. aux. become since his trip  
'how American he has become since her trip'
- b. *lo* *rojo que se puso*  
D.NT red that REFL turn  
'how red he turned'

► The restrictions, where they exist, seem to be semantic.

### ② Obligatoriness of the *que*-clause

The *que*-clause is obligatory in DNRs. In its absence, the structure is ungrammatical.

- (7) a. *lo* *alta* \*(*que es la casa*)  
D.NT high.FM.SG that is the house.FM.SG  
'how high the house is'
- b. *lo* *entretenido* \*(*que fue el primero*)  
D.NT entertaining.MS.SG that was the first.MS.SG  
'how entertaining the first one was'

### ③ Uniformity of the definite determiner

Two aspects of the definite determiner in DNRs that must be accounted for.<sup>1</sup>

#### – Obligatoriness

DNRs require the definite article, no other determiner is grammatical.

- (8) { *lo* / \**esto* / \**mucho* / \**algo* } *alto que es la casa*  
D.NT this.NT much.NT some.NT tall that is the house  
'how tall the house is'

#### – Neuter form

In ordinary restrictive relative clauses in Spanish, definite articles must agree in number and gender with the head noun.

- (9) { *las* / \**la* / \**los* } *bonitas fotos*  
the.FM.PL the.FM.SG the.MS.PL beautiful.FM.PL photo.FM.PL  
*que mostró Jose*  
that showed Jose  
'the photographs that Jose showed'

– DNRs do not seem to abide by this requirement. They uniformly require *lo*, irrespective of the  $\phi$ -features on the fronted predicate.

- (10) { *lo* / \**la* } *larga que era la novela*  
D.NT the.FM.SG long.FM.SG that was the.FM.SG novel.FM.SG
- (11) { *lo* / \**el* } *largo que era el libro*  
D.NT the.MS.SG long.MS.SG that was the.MS.SG book.MS.SG

<sup>1</sup> The precise nature of *lo* is debated in the literature. I do not take a stance on the best syntactic characterization of *lo*, glossing it simply as D.NT throughout (following e.g. Gil y Gaya 1964, Alarcos Llorach 1967 and Álvarez Martínez 1986). What is important is that the morpheme has definite semantics, which is something that all analyses take for granted (for discussion, see Bosque and Moreno 1990, Ojeda 1993 and Gutiérrez-Rexach 1999).

- The predicate that is seemingly heading the relative clause, however, must agree with material internal to the relative clause, suggesting that agreement is not altogether disrupted in these constructions.

(12) *lo* { *larga* / \**largo* } *que era la novela*  
 D.NT long.FM.SG long.MS.SG that was the.FM.SG novel.FM.SG

(13) *lo* { *largas* / \**largas* } *que eran las novelas*  
 D.NT long.FM.PL long.FM.SG that was the.FM.PL novel.FM.PL

- ➡ The agreement pattern suggests a close relationship between the gradable head (e.g. *larga*) and the *que*-clause, in a manner that is categorically different from the relationship between *lo* and the rest of the DNR construction.

### 3 Syntax: DNRs as degree free relatives

- ✱ I argue that DNRs are free relatives, sharing properties with two other existing free relative constructions in the language, *lo que* and quantity free relatives.

#### 3.1 Varieties of free relatives in Spanish

- The syntactic make-up of DNRs depends on three specific properties of Spanish free relatives that are absent from languages like English.

- ① Spanish has the ability to form quantity free relatives, free relatives formed with the quantity relative pronouns *cuanto/cuan*.

(14) *Comió cuanto quiso*  
 ate how much wanted  
 'She ate as much as she wanted'

- ② Quantity free relatives have the ability to pied-pipe a predicate to the front of the relative clause.

(15) a. *Pedro ha escrito cuantos libros escribió Tolstoy*  
 Pedro aux written how many.MS.PL books wrote Tolstoy  
 'Pedro has written as many books as Tolstoy wrote'

b. *Pedro corrió cuan rápido fue necesario para ganar*  
 Pedro run how fast was necessary to win  
 'Pedro run as fast as it was required to win'

- English free relatives in contrast do not allow this type of pied-piping.

(16) \*I will eat what food she makes.

- ③ Spanish cannot form ordinary free relatives with the *wh*-phrase *what*. Free relative of this kind must be formed instead by combining a CP with the definite article *lo* (Plann 1980, Brucart 1992, Arregi 1998, a.o.).

(17) *Comió lo que quiso*  
 ate D.NT that wanted  
 'She ate {as much as / what} she wanted'

- Note that *lo que* free relatives can have degree (same as (14)) and object interpretations.

- ➡ Spanish has both the ability to form free relatives with overt definite articles and to pied-pipe predicates that have degree- and quantity-oriented meanings. These are all the pieces we need to build DNRs in Spanish.

#### • Structures

The structures of English *what* and Spanish *lo que* free relatives are below (following Jacobson 1995, Caponigro 2004 and Arregi 1998, Ojeda 2013, Gutiérrez-Rexach 2014).

(18) a. *English free relative*  
 $[_{DP} D_{\emptyset} [_{CP} [_{DP} \text{what}]_i [C^{\circ} [+REL] \emptyset [_{TP} \dots t_i \dots]]]]$   
 b. *Spanish lo que free relative* [ $\rightsquigarrow$ (17)]  
 $[_{DP} lo [_{CP} [_{DP} Op_{wh}]_i [C^{\circ} [+REL] \text{que} [_{TP} \dots t_i \dots]]]]$

- The structures are formally identical, differing only in the pieces that each language realizes overtly vs. covertly: Spanish shows overtly what English does covertly, and vice-versa.
- The structures of Spanish quantity-relatives build on (18) above, with the crucial addition of the optionally pied-piped predicate.

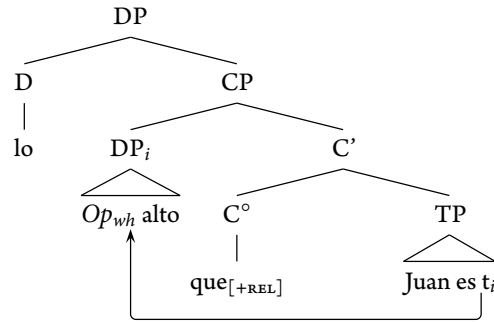
(19) a. *Nominal quantity free relatives* [ $\rightsquigarrow$ (15a)]  
 $[_{DP} D_{\emptyset} [_{CP} [_{DP} \text{cuanto (NP)}]_i [C^{\circ} [+REL] \emptyset [_{TP} \dots t_i \dots]]]]$   
 b. *Gradable quantity free relatives* [ $\rightsquigarrow$ (15b)]  
 $[_{DP} D_{\emptyset} [_{CP} [_{DP} \text{cuan (GradPred)}]_i [C^{\circ} [+REL] \emptyset [_{TP} \dots t_i \dots]]]]$

- ➡ The three key properties of free relatives in Spanish—the ability to form quantity free relatives, the ability to pied-pipe material with the moving *wh*-operator, and the ability to form free relatives with an overt definite determiner—are sufficient to capture the properties of DNRs, as well.

### 3.2 DNRs as free relatives

- I suggest that syntactically DNRs are in between *lo que* and gradable quantity free relatives:

(20) Syntactic structure of DNRs in Spanish



- DNRs in Spanish are free relatives. Like *lo que* relatives, DNRs have an overt definite article, and like *cuan* free relatives, they involve a degree-denoting *wh*-operator that pied-pipes a gradable predicate.
    - The key differences between the two types of constructions lies in the (c)overtness of the pieces involved: what quantity free relatives do overtly, DNRs do covertly and vice versa (as was the case with English *what* vs. Spanish *lo que* free relatives).
    - Quick assessment**  
A number of consequences fall out of this proposal:
      - Relative clauses are obligatory for obvious reasons.
      - The apparent syntactic flexibility of the superficial “head” of the DNR is also explained: it’s not just the predicate that is moving, but a *wh*-phrase.
      - The agreement patterns are unsurprising: the predicate originates inside the CP, and so it is expected to establish all agreement relations there. The neuter agreement on *lo* follows from the fact that unlike with restrictive relatives, its sister is a CP and there is no N goal for D.
    - Moreover, the fact that these constructions use a combination of features that are unavailable in languages like English help us make sense of the cross-linguistic difference.

### 4 Interpretation: DNRs as definite degrees

- DNRs denote maximal degrees, of type  $d$ .
- Assumptions**  
Gradable predicates denote relations between degrees and properties, of type  $\langle d, et \rangle$ .

(21)  $\llbracket tall \rrbracket = \lambda d. \lambda x. tall(d, x)$

- I take the CP in (20) to denote the set of degrees  $d$  such that Juan is  $d$ -tall. For simplicity, I assume that the gradable predicate is always interpreted in its base position, thus combining first with the trace of  $Op_{wh}$ , of type  $d$ .

(22)  $\llbracket CP_{(20)} \rrbracket = \llbracket [_{CP} \lambda d . Juan \text{ is } d\text{-tall}] \rrbracket = \lambda d. tall(d, Juan)$

- The interpretation of *lo***  
The definite determiner *lo* has the semantics of a maximality operator (following Gutiérrez-Rexach 1996, 1999).

(23)  $\llbracket lo \rrbracket = \llbracket MAX \rrbracket = \lambda N_{\langle dt \rangle} . in[N(n) \wedge \forall n' [N(n') \rightarrow n' < n]]$

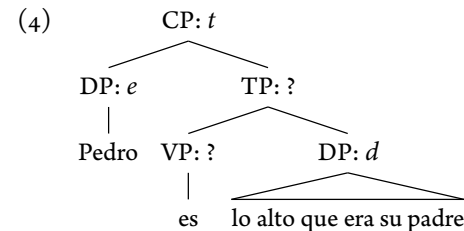
- The interpretation of the LF corresponding to (20) amounts to the maximal degree  $d$  to which Juan is  $d$ -tall.

(24)  $\llbracket DP \rrbracket = \llbracket D \rrbracket (\llbracket CP \rrbracket) = MAX(\lambda d. tall(d, Juan))$

- Thus, we keep the semantics parallel to the ordinary definite article and the overall semantics of DNRs close to other degree constructions (e.g. comparatives, equatives, etc.).

### 5 The Adjective Phrase

- The compositionality problem**  
So far, nothing we have said gets us out of the compositionality problem noted in (4): predicative positions are not  $d$ -type, and verbal predicates do not usually directly take  $d$ -type arguments. As is, the composition of DNRs cannot proceed.



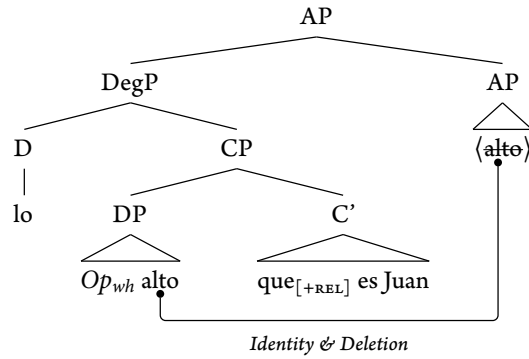
✱ **Proposal**

DNRs must always be part of a larger Adjective Phrase, similar to ordinary adjectives modified by measuring phrases, allowing them to appear in predicative positions like other adjectives without incurring into type-mismatches.

• **DNRs embedded within a more complex structure**

DNRs are embedded within a larger AP where they fulfill the role of a Measure Phrase, as illustrated in (25).

(25) AP structure in DNRs

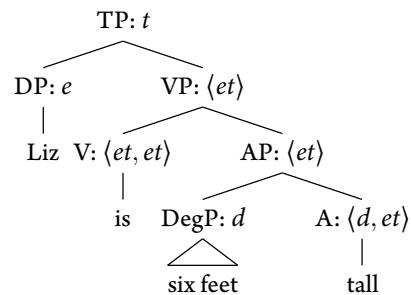


• **DNRs as Degree Phrases**

The role of the DP inside the DNR is the same as Degree Phrases like *6 feet* in Adjectives Phrases like *6 feet tall*.

- A common assumption in the literature is that degrees like *six feet* are names of degrees, projecting a *d*-denoting Degree Phrase/DP. The meaning of a simple sentence like *Liz is six feet tall* is straightforward with our current assumptions.

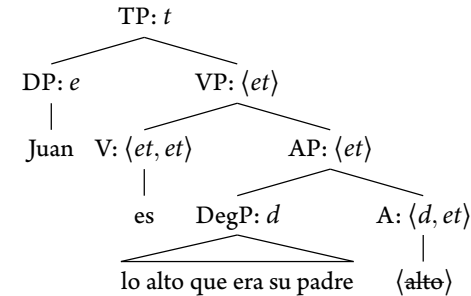
(26)



- (27) a.  $\llbracket \textit{six-feet tall} \rrbracket = \llbracket \textit{tall} \rrbracket (\llbracket 6'' \rrbracket) = \lambda x. \textit{tall}(6'', x)$   
 b.  $\llbracket \textit{Liz is six-feet tall} \rrbracket = \llbracket \textit{is } 6'' \textit{ tall} \rrbracket (\llbracket \textit{Liz} \rrbracket) = \textit{tall}(6'', \textit{Liz})$

- In DNRs, the role of the degree obtained from the free relative is also to measure the extent of the elided adjective, by saturating its degree variable.

(28)



- This sheds light on the determiner restriction: if DNRs require maximality, as suggested by their semantics and the way that the AP is built, then assuming that *lo* is interpreted as a maximality operator explains why other types of determiners/quantifiers are not grammatical.

- Crucially, this structure requires a second copy of the head of the relative clause, that is elided under identity, (25b).

• **Evidence for the AP**

Evidence in favor of (25) comes from the fact that DNRs allow spelling out of the second copy (see Bosque and Moreno 1990).

- (29) *Juan no es lo que era su padre de alto.*  
 Juan not is D.NT that was his father of tall  
 'Juan is not as tall as his father was'

- In such cases, the preposition *de* is obligatory. This is also the case in other measuring constructions that presumably lack a DP internal copy, suggesting that it is the highest copy in (30a) the one that is being pronounced, and not a reconstructed CP-internal copy.

- (30) a.  $[_{AP} [_{DP} \textit{lo } \langle \textit{alto} \rangle \textit{ que era su padre } ] [_A \textit{*(de) } \textit{alto} ]]$   
 b.  $[_{AP} [_{DP} \textit{dos metros } ] [_A \textit{*(de) } \textit{alto} ]]$

• **Deletion & Identity**

This deletion operation is similar to Comparative Deletion (Kennedy 1999, Kennedy and Merchant 2000).

- (31) a. Jill wrote more books than Sue read (~~books~~)  
 b. My sister drives as carefully as I drive (~~carefully~~)

- There are two flavors of Comparative Deletion.

– *Weak Comparative Deletion* [English-type]  
 In English, Comparative Deletion is obligatory *if and only if* there is identity between the two objects of the comparison. That is, when it comes to Comparative Deletion, you can only delete under identity, and if you can delete, you must.

- (32) a. \*Jill wrote more books than Sue read books  
 b. Jill wrote more books than Sue read magazines  
 c. Jill wrote more books than Sue read  $\{ \langle \text{books} \rangle / \# \langle \text{magazines} \rangle \}$

– *Strong Comparative deletion* [Spanish-type]  
 In certain Spanish comparatives, we see a stronger version of Comparative Deletion, where we observe (i) obligatory deletion under identity and (ii) obligatory identity (see Gutiérrez Ordóñez 1994).

- (33) a. Compré más libros de los  $\langle \text{libros} \rangle$  que compraste tú.  
 bought more books of the books that bought you  
 ‘I bought more books than the books you bought’  
 b. \*...más libros de los libros que compraste tú  
 c. \*...más libros de los cómics que compraste tú  
 d. #...más libros de los  $\langle \text{cómics} \rangle$  que compraste tú

– The example in (33a) shows that the only interpretation of the relative clause construction is that of an amount of books, in spite of the fact that there is no overt predicate *books*. Example (33b) shows that *books* cannot be overt, and example (33c)/(33d) show that the head cannot be different, neither overtly nor covertly. Thus, this is a case of “strong” Comparative Deletion: you must delete under identity, and only identity is allowed.

➡ The deletion of the adjective in DNRs is the same type of operation.

- Note also that:

– DNRs do not allow multiple predicates either (cf. (33c) above):

- (34) a. \*lo alta que era la mesa (de) ancha  
 the tall that was the table of wide  
 b.  $[[\text{lo alta que era la mesa}] \langle \text{alta} \rangle]$   
 c.  $[[\text{lo} \langle \text{alta} \rangle \text{ que era la mesa}] \text{ de alta}]$

– The identity between the two copies of the gradable predicate must be absolute. For instance, since predicative adjectives must agree with their subjects in Spanish, it is easy to create a GENDER mismatch in examples like (35). These mismatches, however, result in ungrammaticality:

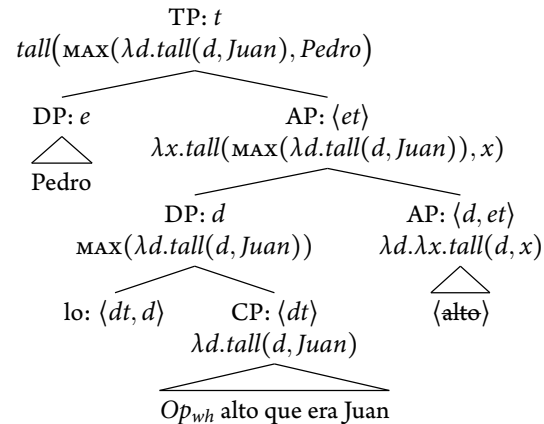
- (35) a. Juan no es lo  $\{ * \text{alto} / * \text{alta} / \text{cool} \}$  que es María.  
 Juan not is D.NT tall.MS tall.FM cool that is María  
 ‘Juan is not as  $\{ \text{tall} / \text{cool} \}$  as María’  
 b. María no es lo  $\{ * \text{alto} / * \text{alta} / \text{cool} \}$  que es Juan  
 María not is D.NT tall.MS tall.FM cool that is Juan  
 ‘María is not as  $\{ \text{tall} / \text{cool} \}$  as Juan’

- **Final result**

The AP argued for above straightforwardly allows the correct interpretation of DNRs.

- (36) Pedro es lo alto que era Juan.  
 Pedro is the tall that era Juan  
 ‘Pedro is as tall as Juan’

- (37) **Interpretation of predicative DNRs**



- According to (37) Pedro is (at least) as tall as Juan. This is the right interpretation, since (36) is compatible with both weak and strong interpretations, just like other equatives.

## 6 Conclusions

- We started off by asking two general questions:

– **Problem 1**: definite article with a variety of gradable predicates

The neuter definite article *lo* has the semantics of a maximality operator. It does not directly compose with the fronted predicate, but with a CP denoting a set of degrees. A single meaning for *lo* can do.

- **Problem 2: composing with degrees**  
DNRs do not compose with verbal predicates directly. They compose with an adjectival predicate, which can independently take degree arguments, and this AP then composes with the verb.
- Thinking of DNRs in this way accounts for their main properties:
  - *Why can DNRs only surface with lo?*  
As Measure Phrases, they must be of type *d* to saturate the degree variable of the higher gradable predicate. The definite article has this interpretation built in.
  - *Why doesn't the definite article agree with the predicate?*  
The superficial “head” of the *que*-clause is not a head; it is a predicate embedded within a quantity *wh*-phrase, which contains no N, overt or otherwise, that can serve as goal for D.
  - *Why are DNRs so flexible?*  
Their flexibility reflects the flexibility in free relative formation: if a given category can be moved as part of a free relative construction, it can be expected to be able to form DNRs (modulo orthogonal semantic considerations).
- **General Consequences**
  - *DNRs cross-linguistically*  
If the analysis is on the right track, it provides a way to think about the cross-linguistic distribution of DNRs, and makes clear predictions: DNRs are expected in languages that can form free relatives at least with (i) an overt definite article and with (ii) quantity *wh*-words that can pied-pipe a predicate.
  - *Free relatives*  
More generally, the analysis supports the view that definite free relatives require a determiner to semantically close a property (Jacobson 1995, Caponigro 2004, a.o.), either overt or covert.
  - *Definite article*  
DNRs provide evidence for the expected convergence between definite articles (as *t*-operators; e.g. Link 1983) and maximality operators (e.g. Rullmann 1995), which share the semantic task of extracting maxima out of an ordering of atoms (be it individuals, degrees, or propositions (Dayal 1996, Mendia 2017)).

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## A The relation to Amount Relatives in Spanish

- ✱ Minimally modifying the account of DNRs offered above, we can provide a straightforward analysis of Amount Relatives in Spanish (cf. Carlson 1977, Grosu and Landman 1998, Herdan 2008, a.o.).

- **Amount Relatives**

Ordinary looking relative clauses may sometimes obtain “amount interpretations”.

(38) *Jose ha traído las manzanas que trajo Juan aquel año*  
 Jose AUX brought the apples that brought Juan that year  
 ‘Jose brought the amount of apples that Juan brought that year’

- ➡ Amount Relatives are challenging because, despite resembling ordinary restrictive relative clauses, they refer to a definite amount, not to a definite individual.

- **Another compositional problem**

Like with DNRs, the consensus is that amount interpretations involve degree abstraction at the CP level, resulting in sortally mismatched intersection.

(39)  $\{x : x \text{ is an apple}\} \cap \{d : \text{Juan brought } d\text{-MANY apples}\}$

- **Amount Relatives**

As with DNRs, we can exploit the fact that Spanish makes use of two different free relatives that denote amounts: *lo que* and *cuanto* free relatives (see (15b) and (17)).

(19) a. *Nominal quantity free relatives*  $[\sim(15a)]$   
 $[\text{DP } D_{\emptyset} [\text{CP } [\text{DP } \text{cuanto (NP)}] ]_i [ \text{C}^{\circ}[\text{+REL}] \emptyset [\text{TP } \dots t_i \dots ] ] ] ]$

b. *Lo que free relatives*  $[\sim(17)]$   
 $[\text{DP } \text{lo} [\text{CP } [\text{DP } Op_{wh} ] ]_i [ \text{C}^{\circ}[\text{+REL}] \text{que} [\text{TP } \dots t_i \dots ] ] ] ]$

(40) a. *Degree Neuter Relatives*  
 $[\text{DP } D_{NT} [\text{CP } [\text{DP } Op_{wh} \text{ GradPred} ] ]_i [ \text{C}^{\circ}[\text{+REL}] \text{que} [\text{TP } \dots t_i \dots ] ] ] ]$

b. *Amount Relatives*  $[\sim(38)]$   
 $[\text{DP } D_{\varphi} [\text{CP } [\text{DP } Op_{wh} \text{ NP}_{\varphi} ] ]_i [ \text{C}^{\circ}[\text{+REL}] \text{que} [\text{TP } \dots t_i \dots ] ] ] ]$

- Like *lo que* relatives, Amount Relatives in Spanish have an overt definite article, and like *cuanto* free relatives, they involve a quantity-denoting *wh*-operator that pied-pipes an NP.

- **Definite amounts**

Like DNRs, Amount Relatives denote maximal degrees (following Grosu and Landman 1998 a.o.). Ingredients: (i) a silent MANY predicate (e.g. Hackl 2000), (ii)

a MAX semantics for the definite determiner, and (iii) a Jacobson’s (1995) and Caponigro’s (2004) syntax-semantics mapping of free relatives.

(41)  $[\text{DP}_1 \text{ las } [\text{CP}_1 [\text{DP}_2 \text{ MANY manzanas} ]_i [\text{CP}_2 \text{ que Juan trajo } t_i ] ] ]$   
 the apples that Juan brought  
 ‘The apples that Juan brought’

(42)  $[[\text{MANY}]] = \lambda P_{(et)}. \lambda Q_{(et)}. \lambda d. \exists x [P(x) \wedge Q(x) \wedge |x| = d]$

(43)  $[[\text{DP}_1]] = \text{MAX}(\lambda d. \exists x [\text{manzanas}(x) \wedge \text{trajo}(\text{Juan}, x) \wedge |x| = d])$

- **The Measure Phrase**

Like DNRs, Amount Relatives are embedded under a larger phrase that contains a identical predicate. In this case, the predicate can only combine with a degree by means of a measuring predicate MEAS, in parallel with cardinal numbers:

(44) **Cardinal Numeral** (45) **Amount Relative**  
 MeasP MeasP  
 DegP: *d* Meas’ DegP: *d* Meas’  
 | three MEAS NP:  $\langle et \rangle$  Amount Relative MEAS  $\langle \text{NP} \rangle$ :  $\langle et \rangle$

(46)  $[[\text{MEAS}]] = \lambda P_{(et)}. \lambda n_d. \lambda x_e. P(x) \wedge |x| \geq n$

(47)  $[[\text{MeasP}_{(38)}]] = \lambda y_e. *manzana(y) \wedge |y| = \text{MAX}(\lambda d. \exists x [ *manzana(x) \wedge \text{trajo}(\text{Juan}, x) \wedge |x| = d])$

- The final denotation is provided below:<sup>2</sup>

(48)  $[[ (43) ] ] = \exists x [\text{trajo}(\text{Jose}, x) \wedge *manzana(x) \wedge |x| = \text{MAX}(\lambda d. \exists y [ *manzana(y) \wedge \text{trajo}(\text{Juan}, y) \wedge |y| = d])]$

- ➡ The interpretation correctly captures the facts that (i) Amount Relatives refer to a definite amount, (ii) the interpretation of the “head” of the relative clause is interpreted as an indefinite, and (iii) the comparison is set between two amounts of the *same* stuff.

- ➡ The resulting general state of affairs is one where DNRs and Amount Relatives require a covert *wh*-operator pied-piping a predicate, and a definite article conveying definiteness. They are but two sides of the same coin.

<sup>2</sup> Measure Phrases of type  $\langle et \rangle$  cannot directly combine with predicates that take *e*-type arguments; instead, they Restrict them.