Degree Relatives and their kin

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Introduction. This paper presents a syntax and semantics for Degree Neuter Relatives in Spanish (DNRs; Rivero 1981, Ojeda 1982, Gutiérrez-Rexach 1999, a.o.), an unusual construction involving a relative clause seemingly headed by a gradable predicate and the neuter determiner *lo* (1).

(1) *Juan es* [$_{DP}$ *lo alto que era su padre*] 'Juan is as tall his father was'
Juan is LO tall that was his father [Lit.: 'Juan is the tall that his father was']

Previous analyses of DNRs have put forth the idea that DNRs denote maximal degrees, but while intuitive, straightforward implementations of the idea run into trouble when combining the resulting definite degree (type *d*) with verbal predicates that do not take *d*-type arguments–including predicative cases like (1). I propose an analysis wherein the DNR itself is of predicative type, but contains within it a maximal degree that serves as a Measure Phrase within an Adjective Phrase.

Goal. The goal of this paper is twofold. First, I propose an analysis of DNRs that avoids compositionality problems derived from sortal mismatches between degrees and entities. In my view, the DP occupies the specifier position of an AP, which mediates between degrees and verbs taking *e*-type arguments. Second, I suggest that despite the cross-linguistic rarity of DNRs, it is not coincidence that they are available in Spanish: the proposed analysis relies on aspects of the morphological inventory of Spanish that allows the language to construct degree-denoting Free Relatives (FRs) headed by a definite article, and so DNRs should not be expected in languages lacking this ability.

Proposal. **Step I: The syntax of DNRs**. The syntactic analysis of DNRs builds on that of FRs in Spanish, which have the following two key properties: (*i*) they can surface with an overt definite determiner (note that while FRs have been argued to involve a definite determiner in the syntax, not all languages realize them overtly, as in English; Jacobson 1995, Caponigro 2002). (*ii*) they can be formed with quantity *wh*-words like *cuan*/*cuanto* ("how"/"how many").

(2) *Comió* { a. *cuanto* / b. *lo que* } *quiso* 'She ate as much as he wanted'
ate how much LO that wanted [Lit.: 'she ate {the that / how much} wanted']

(3) *Juan es cuan alto fue su padre* 'Juan is as tall as his father was'
Juan is how tall was his father [Lit.: 'Juan is how tall his father was']

I propose that DNRs may be formed with the same pieces as FRs. More specifically, both constructions involve a definite determiner, whether overt or covert. Both also involve the movement of a *wh*-phrase to the specificer of CP. In DNRs, the *wh*-phrase is headed by a null variant of a quantity-*wh*-phrase and includes the gradable predicate. The key differences between the two types of constructions lies in the (c)overtness of the pieces involved: what FRs do overtly, DNRs do covertly and vice versa, as schematized in (4).

(4) a. [$_{DP}$ D$_{\varnothing}$ [$_{CP}$ [$_{DP}$ cuan GradPred]$_i$ [C°[+REL] $\varnothing$ [$_{TP}$ …t$_i$ …]]]] [degree FR]
b. [$_{DP}$ lo [$_{CP}$ [$_{DP}$ *Op$_{wh}$* (MANY)]$_i$ [C°[+REL] que [$_{TP}$ …t$_i$ …]]]] [*lo que* FR]
c. [$_{DP}$ lo [$_{CP}$ [$_{DP}$ *Op$_{wh}$* GradPred]$_i$ [C°[+REL] que [$_{TP}$ …t$_i$ …]]]] [DNR]

On this analysis, the head of the DNR is not in fact a gradable predicate as it appears. Rather, the gradable predicate is embedded within a complex *wh*-phrase. This provides an explanation for two otherwise puzzling facts. First, unlike ordinary restrictive relative clauses, DNRs show a disrupted agreement pattern: the definite article *lo* never agrees with what is seemingly the head of the relative clause (5a); in contrast, the gradable predicate alway must agree with CP-internal material (5b).

(5) a. { *lo / *la } *alta que era su madre*
LO the.FM.SG tall.FM.SG that was her mother.FM.SG
b. *lo* { **alto / alta* } *que era su madre*
LO tall.MS.SG tall.FM.SG that was her mother.FM.SG

Second, this explains the apparent syntactic flexibility of the superficial head of the DNR: gradable predicates of any syntactic category that is coercible into a gradable interpretation can form a grammatical DNR. Given that predicates of different categories are otherwise extractable to differing degrees in Spanish, this flexibility is puzzling if the predicates themselves were undergoing movement. On the present analysis, however, this issue does not arise–all of the constructions in (6) involve movement of a *wh*-phrase.

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

Step 2: Semantics. I assume that gradable predicates are interpreted *in situ* as a function from degrees to properties (Kennedy & McNally 2005; e.g. $[\![tall]\!] = \lambda d\,.\,\lambda x\,.\,tall(d,x)$). The movement of a null degree operator Op_{wh} creates a degree property (type $\langle dt\rangle$) at the CP level, and leaves a *d*-type trace that serves as the first argument to the gradable predicate. Assume further that when the definite article in Spanish applies to a set of degrees, it returns its maximal element (Gutiérrez-Rexach 1999), and so it is defined in terms of a MAX operator (Heim 2001), (7a). (7b) is the final denotation of the DP in (1), ignoring tense.

(7) a. $[\![\text{MAX}]\!] = \lambda D_{\langle dt\rangle}\,.\,\iota d\,[d \in D \wedge \forall d'[d' \in D \wedge d \neq d' \rightarrow d' < d]]$
b. $[\![[_{\text{DP}}\ \text{lo}\ \lambda d\ [_{\text{CP}}\ \text{su padre era}\ d\text{-alto}]]]\!] = \text{MAX}(\lambda d\,.\,[tall(his\text{-}father, d)])$

Step 3: The AP. In order to allow verbs taking *e*-type arguments combine with a degree, I propose that DNRs must always be part of a larger Adjective Phrase, similar to ordinary adjectives modified by measure phrases (e.g. *dos metros de alto*, "two meters tall"), (8a). As with ordinary APs, the DP in DNRs simply fulfills the duty of a Measure Phrase. Crucially, this structure requires a second copy of the head of the relative clause, that is elided under identity, (8b). (1) is interpreted as in (9).

(8) a. $[_{\text{AP}}\ [_{\text{DP}}\ \text{DNR}_d\ ]\ [_{\text{A'}}\ \text{Gradable Predicate}_{\langle d,et\rangle}\ ]]$ b. $[_{\text{AP}}\ [_{\text{DP}}\ \text{lo}\ \textbf{alto}\ \text{que es Pedro}\ ]\ [_{\text{A}}\ \langle \textbf{\sout{alto}}\rangle\ ]]$

(9) $[\![(1)]\!] = tall(Juan, \text{MAX}(\lambda d.tall(his\text{-}father, d))$

Evidence in favor of (8b) comes from the fact that DNRs allow spelling out of the second copy, (10a). (The full paper provides further evidence for the availability of similar elision processes in Spanish.) Like in Measure Phrases (10b), the preposition *de* is obligatory, suggesting that it is the second copy the one that is being pronounced in (10a), and not a reconstructed CP-internal copy.

(10) a. $[_{\text{AP}}[_{\text{DP}}\ \text{lo}\ \langle \sout{\text{alto}}\rangle\ \text{que era su padre}\ ]\ [_{\text{A}}\ \text{*(de) alto}\ ]]$ b. $[_{\text{AP}}\ [_{\text{DP}}\ \text{dos metros}\ ]\ [_{\text{A}}\ \text{*(de) alto}\ ]$

Final remarks. The analysis presented here sheds light on why, despite the cross-linguistic rarity of DNRs, they are found in Spanish. Spanish FRs show an uncommon combination of properties that together can explain the availability of DNRs: (*i*) FRs with overt definite determiners and (*ii*) FRs with quantity *wh*-operators. In the full paper, I extend the analysis to another construction that is predicted to exist given these pieces: Amount Relatives (Carlson 1977, Grosu & Landman 1998), whose properties in Spanish are shown to differ from those found in languages like English.