Vietnamese subcomparatives, the grammar of degrees, and comparative deletion[1]

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Abstract. Beck et al. (2009) conducted a cross-linguistic survey of degree constructions and proposed three parameters to classify languages according to the constructions they allow and their available interpretations: 1. whether a language has degrees in its semantics; 2. whether a language has degree abstraction; and 3. whether a language allows the degree argument position of a gradable predicate to be overtly filled. This paper provides novel data from Vietnamese that test the predictions of these parameters. Languages with clausal comparatives and a positive setting for these parameters should allow subcomparatives. This paper shows that Vietnamese is such a language, but despite this, many subcomparatives are ungrammatical. Further examination of the data reveals a crucial generalization: a predicate's ability to remain in the standard of a subcomparative is linked to its ability to interact with *nhiều* 'much, many'. I propose that this generalization can be captured by positing that degrees combine directly with some Vietnamese predicates, while in other cases degrees combine with *nhiều* or its silent counterpart μ before combining with predicates, an idea inspired by Bresnan (1973), Grano and Kennedy (2012) and Wellwood (2012). I also propose a mandatory deletion operation that occurs in the standards of Vietnamese comparatives, forcing predicates to elide when they combine directly with degrees but allowing them to remain overt when degrees must first combine with *nhiều*/μ.

Keywords: Vietnamese, degree, subcomparative, typology, comparative deletion.

1. Introduction

In their cross-linguistic survey of comparatives and other constructions with degrees, Beck et al. (2009) propose three parameters along which languages may be classified (1):

(1) a. **Degree Semantics Parameter (DSP):** A language {does/does not} have gradable predicates, i.e. lexical items that introduce degree arguments.
b. **Degree Abstraction Parameter (DAP)** A language {does/does not} have binding of degree variables in the syntax, i.e. degree abstraction.
c. **Degree Phrase Parameter (DegPP):** The degree argument position of a gradable predicate {may/may not} be overtly filled.

A language with a positive setting for all three parameters and clausal comparatives (2b) should allow difference comparatives (3a) and comparisons with degrees (3b) (+DSP), exhibit negative island effects (3c) and scope ambiguities (3d) (+DAP), and allow degree questions (3e), measure phrases (3f), and subcomparatives (3g) (+DegPP). English is an example of this type of language (Beck et al., 2009: 13, 28), and it meets these expectations.

(2) a. **Phrasal comparative:** John is taller than [Mary]. (surface DP standard)
b. **Clausal comparative:** John is taller than [Mary thought]. (surface CP standard)

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(3) a. **Difference comparative:** John is 2 inches taller than Mary.
b. **Comparison with a degree:** John is taller than 6 feet.
c. **Negative island effect:** *John bought a more expensive book than nobody did.
d. **Scope ambiguity:** The paper is 10 pages long. It must be exactly 5 pages longer.
✓ Reading 1 (*must* > DegP): The paper must be exactly 15 pages long and no more.
✓ Reading 2 (DegP > *must*): The paper must be at least 15 pages long.
e. **Degree question:** How tall is John?
f. **Measure phrase:** John is 6 feet tall.
g. **Subcomparative:** John is taller than the car is long.

As I argue below, Vietnamese is also a language with a positive setting for all three parameters that allows clausal comparatives. It largely conforms to the predictions of Beck et al.'s (2009) typology, but there is one exception. Many subcomparatives are ungrammatical (4a); their meanings must be expressed by nominalizing the gradable predicate in the standard (4b).

(4) a. * Cái bàn dài hơn cái ghế cao.
CLF table long exc. CLF chair tall
Int. 'The table is longer than the chair is tall.'[2] (NPD, PK)
b. Chiều dài của cái bàn hơn chiều cao của cái ghế.
direction long of CLF table exc. direction tall of CLF chair
'The length of the table exceeds the height of the chair.' (NPD)

Interestingly, certain subcomparatives are acceptable in Vietnamese, with some subject to speaker variation (indicated by %, 5a). Thus, there are some subcomparatives that are unacceptable to all speakers (4a), some that are acceptable to some speakers but not others (5a), and some that are acceptable to all speakers (5b).

(5) a. % Mary vui hơn John buồn.
Mary happy exc. John sad
'Mary is happier than John is sad.' (✓NPD, *PK)
b. Phoebe thích hoá học hơn là Tyler thích toán.
Phoebe like chemistry exc. C Tyler like math
'Phoebe likes chemistry more than Tyler likes math.' (✓NPD, ✓PK)

I argue that this pattern is the result of differences in the ways that predicates interact with degree expressions (i.e. Deg/DegP) in Vietnamese. More specifically, I argue that some predicates like *cao* 'tall' are inherently gradable and can combine directly with degrees; these are type <*d*,*et*> (von Stechow, 1984). Other predicates like *thích* 'like' cannot combine directly with degrees. Instead, degree expressions first combine with an additional morpheme *nhiều* 'much, many' or, in some cases, its silent counterpart μ before combining with these predicates, an idea inspired by Bresnan (1973), Grano and Kennedy (2012) and Wellwood (2012). This difference in how predicates compose with degree expressions interacts with a comparative deletion operation that forces the complement of Deg to elide in the standard of comparatives. The result is that predicates that combine directly with Deg must elide, but predicates for which the relationship with degree expressions is mediated by *nhiều*/μ may remain. This analysis shows

[2]Throughout this paper, I use *Int.* and *exc.* as abbreviations for "intended meaning" and "exceed" respectively.

that being +DSP, +DAP, and +DegPP and having clausal comparatives is not enough for a language to allow subcomparatives. The language must also combine predicates with degrees in such a way that its comparative deletion operation allows them to remain.

This paper proceeds as follows. Section 2 shows that Vietnamese has clausal comparatives and is +DSP, +DAP, and +DegPP. Section 3 discusses subcomparatives of varying grammaticality as well as repair strategies. Section 4 discusses the distribution of *nhiều* 'much, many' with a focus on nominal comparatives and intensification with *rất* 'very' and *rất nhiều* 'very much', and it connects these data to the subcomparative data in section 3. Section 5 presents the analysis of how different predicates interact with degree expressions. Section 6 concludes.

2. Overview of Vietnamese degree constructions

In this section, I provide novel data on Vietnamese comparatives and other constructions with degrees in order to demonstrate that Vietnamese allows clausal comparatives and should be considered +DSP, +DAP, and +DegPP in Beck et al.'s (2009) typology. These generalizations predict the availability of subcomparatives in Vietnamese, making the fact that many subcomparatives are ungrammatical rather surprising.

2.1. Basic comparatives and the possibility of clausal standards

Vietnamese forms comparatives from non-comparatives by following a gradable predicate with *hơn*, a verb that means 'surpass', 'exceed', or 'be more than', and an optional standard (6).

(6) a. Wes cao.
Wes tall
'Wes is tall.' (NBT)

b. Huế nhỏ.
Hue small
'Hue is small.' (NBT)

c. Tôi thích phở.
1SG like pho
'I like pho.' (NPD)

d. Tyler cao hơn (Nathalie).
Tyler tall exc. (Nathalie)
'Tyler is taller (than Nathalie).' (NBT)

e. Huế nhỏ hơn Hà Nội.
Hue small exc. Hanoi
'Hue is smaller than Hanoi.' (Ansaldo, 2010: 939)

f. Tôi thích phở hơn Phoebe.
1SG like pho exc. Phoebe
'I like pho more than Phoebe.' (NPD)

Examples (6d)-(6f) show that Vietnamese allows (surface) phrasal standards, but clausal (CP) standards are also possible. There are several pieces of evidence for clausal standards. The first is the optional use of an overt complementizer *là* (Trinh, 2005; Tran, 2009) in examples where the standard has clausal syntax (7) and even with overtly phrasal standards (8). *là* is also used outside of comparatives to introduce embedded clauses after a variety of predicates (9).

(7) a. Phoebe giàu hơn (là) tôi tưởng.
Phoebe rich exc. (C) 1SG think
'Phoebe is richer than I thought.' (NPD)

b. Phoebe hát ồn hơn (là) Tyler huýt sáo.
Phoebe sing loud exc. (C) Tyler whistle
'Phoebe sang louder than Tyler whistled.' (NPD)

(8) Tôi thích trà hơn (là) cà phê.
1SG like tea exc. (C) coffee
'I like tea more than coffee.' (NPD, cf. Tran et al., 2012: 111)

(9) a. Nó nghĩ là tôi đọc sách.
3SG think C 1SG read book
'He thinks that I read books.'
(Trinh, 2005: 34)

b. Không phải (là) mọi sinh viên sẽ đến.
NEG true (C) every student FUT arrive
'It is not the case that every student will arrive.'
(Tran, 2009: 35)

There is also other, stronger evidence for clausal standards. One such piece of evidence is the possibility of multiple standards. Under the assumption that elements that introduce standards (*than* in English, *hơn* in Vietnamese) can only really take one standard complement, multiple standards result from clausal reduction (Lechner, 2001; Bhatt and Takahashi, 2011). English allows such clausal reduction to derive multiple standards (10a). Vietnamese does as well (10b).

(10) a. Tina read more books today than Pim ~~read *d*-many books~~ yesterday.
(Bhatt and Takahashi, 2011: 594; reduction based on Lechner, 2001: 694)

b. Hôm này Sài Gòn nóng hơn Hà Nội ~~*d*-nóng~~ hôm qua.
day this Saigon hot exc. Hanoi ~~*d*-hot~~ day pass
'Today Saigon is warmer than Hanoi ~~was *d*-warm~~ yesterday.' (NPD)

The last piece of evidence that Vietnamese allows clausal standards comes from the scope interpretations available to quantifiers inside the standard (Bhatt and Takahashi, 2011: 602). If the standard is a CP, then a quantifier can take scope inside it, and thus below *-er* or the language equivalent. By contrast, if the standard is a DP, then the quantifier must scope above *-er*, because it would have no clause in the standard within which to take scope. In an English sentence like (11), there are two possible readings corresponding to *-er* > *every* and *every* > *-er*, though speakers typically agree that the *every* > *-er* reading is much more difficult to access.

(11) a. More students read every syntax paper than (read) every semantics paper.

b. ✓ Reading 1 (*-er* > *every*): The number of students who read every syntax paper exceeds the number of students who read every semantics paper.

c. ?? Reading 2 (*every* > *-er*): The least read syntax paper was still read by more students than every semantics paper. (Bhatt and Takahashi, 2011: 602)

Vietnamese patterns like English with respect to these judgments. A surface phrasal comparative with a quantifier standard shows the same scope ambiguity (12), indicating both that clausal standards are possible and that surface phrasal standards can be derived from clausal reduction.

(12) a. Nhiều sinh viên đã đọc mọi bài viết sinh học hơn mọi bài viết hoá học.
much student PST read every essay biology exc. every essay chemistry
'More students read every biology paper than every chemistry paper.'

b. ✓ Reading 1 (*-er* > *every*)

c. ✓/? Reading 2 (*every* > *-er*) (PK, similar example tested with NPD)

Taken together, all of these pieces of evidence, namely the possibility of overt complementizers in standards, the possibility of multiple standards via clausal reduction, and scope ambiguity for quantifiers in standards, show that Vietnamese allows clausal standards and the derivation of phrasal standards from clausal sources. This suggests that *hơn* 'exceed' functions like its English analogue *-er*, often described as the "2-place *-er*". A denotation for *hơn* is provided in (13a) along with a denotation for max(P) (13b). These denotations draw from Heim (2000: 42), Beck et al. (2009: 5), and Bochnak (2018: 364). This *hơn* is designated $hơn_{NC}$ for "normal comparative". This is to differentiate it from versions of *hơn* used in other degree constructions.

(13) a. $[\![\text{hơn}_{\text{NC}}]\!] = \lambda P_{<d,t>}.\lambda Q_{<d,t>}.\max(Q) > \max(P)$
b. $[\![\max(P)]\!] = \iota d.P(d) = 1 \;\&\; \forall d'[P(d') = 1 \rightarrow d' \leq d]$
'The unique degree d such that P(d) = 1 and for all d', d' is less than or equal to d.'

As noted above, clausal standards are necessary for subcomparatives. Beyond this fact about the syntax of comparatives, the grammar of degrees must also work in a certain way to permit subcomparatives. I now turn to showing that the grammar of degrees predicts the availability of subcomparatives in Vietnamese.

2.2. Evidence for lexical items that introduce degree arguments (+DSP)

To show that Vietnamese has lexical items that introduce degree arguments, we need to look at constructions that reference degrees directly (Beck et al., 2009: 18). One such construction is difference comparatives. These feature measure phrases that describe the degree to which two entities differ on the scale referenced by the predicate (height in (14a), age in (14b)). This measure phrase is incorporated as a type *d* argument of *hơn* 'exceed'; a denotation based on Beck et al. (2009) is provided in (15). This *hơn* is designated $\textit{hơn}_{DC}$ for "difference comparative".

(14) a. Tucker cao hơn Tyler mười phân.
Tucker tall exc. Tyler ten cm
'Tucker is 10 cm taller than Tyler.'
(NBT)

b. Tyler lớn hơn Phoebe một tuổi.
Tyler large exc. Phoebe one age
'Tyler is 1 year older than Phoebe.'
(NPD)

(15) $[\![\text{hơn}_{\text{DC}}]\!] = \lambda d'_d.\lambda P_{<d,t>}.\lambda Q_{<d,t>}.\max(Q) \geq \max(P) + d'$

Another construction that provides evidence for lexical items that introduce degree arguments is comparisons with degrees. In this construction, the standard is a measure phrase of type *d*, and it is compared directly with the degree to which some entity embodies some predicate. Some Vietnamese examples are provided in (16), and the relevant denotation for *hơn* (designated $\textit{hơn}_{CWD}$ for "comparison with degree") is provided in (17).

(16) a. Tudor cao hơn một thước.
Tudor tall exc. one meter
'Tudor is taller than 1 meter.'
(NBT)

b. Cuốn sách này dài hơn ba trăm trang.
CLF book this long exc. three hundred page
'This book is longer than 300 pages.'
(NBT & BQL)

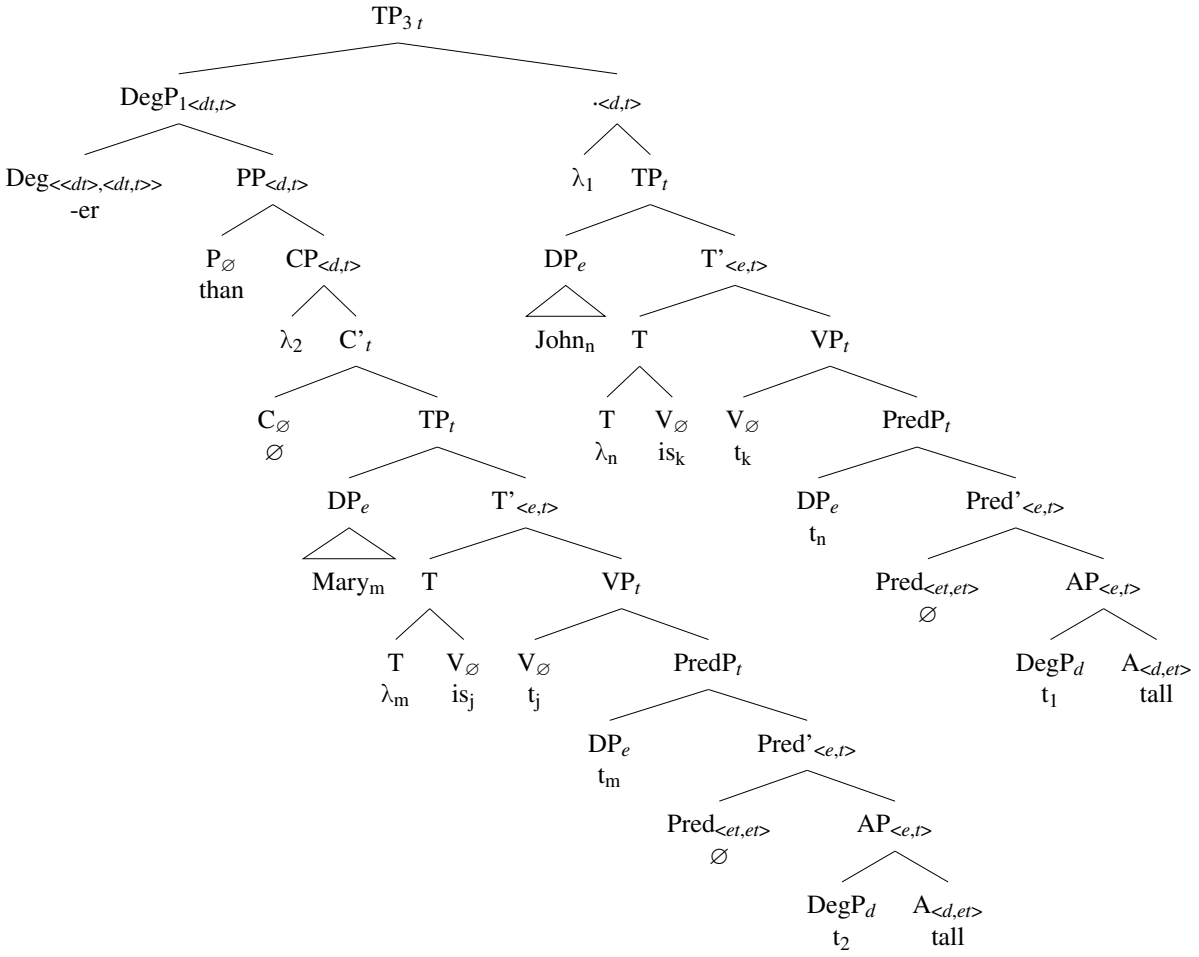
(17) $[\![\text{hơn}_{\text{CWD}}]\!] = \lambda d'_d.\lambda Q_{<d,t>}.\max(Q) > d'$ (Beck et al., 2009: 5)

2.3. Evidence for degree abstraction (+DAP)

If a language has degrees, then one can ask the question of whether that language has degree abstraction (Beck et al., 2009: 22). Degree abstraction comes in two forms. The first is a type of quantifier raising in which a DegP of type <*dt*,*t*> headed by *-er* raises for reasons of semantic composition (Heim, 2000). It cannot compose in its base position, where it would need to be type *d*. This is shown with an English example in (18), where the matrix DegP *-er than Mary is d-tall* undergoes degree abstraction, with *is d-tall* eliding. This exact structure has not been proposed before to my knowledge, and it is not the one that I will adopt for Vietnamese, but it suffices for our current purposes. For evidence that the subjects of adjectives are generated external to AP in a projection like PredP, see Baker (2003) and Meltzer-Asscher (2011).

The second form of degree abstraction occurs in CP standards. This form of degree abstraction is a type of predicate abstraction (Heim and Kratzer, 1998) with a degree operator. This operator creates a λ at the left edge of the embedded CP, making the CP type <*d*,*t*> and allowing the CP and the semantically vacuous *than* to compose with *-er* (Chomsky, 1977) (18). Details about the semantics of (18) are provided in (19).

(18) John is taller than Mary ~~is d-tall~~.



(19) a. $[\![\text{tall}]\!] = \lambda d_d.\lambda x_e.\text{tall}(x) \geq d$ (Beck et al., 2009: 4)

b. $[\![\text{-er}]\!] = \lambda P_{<d,t>}.\lambda Q_{<d,t>}.\max(Q) > \max(P)$ (Beck et al., 2009: 5)

c. $[\![\max(P)]\!] = \iota d.P(d) = 1 \;\&\; \forall d'[P(d') = 1 \rightarrow d' \leq d]$ (Beck et al., 2009: 5)

d. $[\![\text{CP}]\!] = \lambda d_d.\text{tall}(\text{Mary}) \geq d$

e. $[\![\ .\ ]\!] = \lambda d_d.\text{tall}(\text{John}) \geq d$

f. $[\![\text{DegP}_1]\!] = \lambda Q_{<d,t>}.\max(Q) > \iota d.\text{tall}(\text{Mary}) \geq d \;\&\; \forall d'[\text{tall}(\text{Mary}) \geq d' \rightarrow d' \leq d]$

g. $[\![\text{TP}_3]\!] = \iota d.\text{tall}(\text{John}) \geq d \;\&\; \forall d'[\text{tall}(\text{John}) \geq d' \rightarrow d' \leq d] > \iota d.\text{tall}(\text{Mary}) \geq d \;\&\; \forall d'[\text{tall}(\text{Mary}) \geq d' \rightarrow d' \leq d]$

In some languages this degree operator movement is overt, resembling a form of *wh*-movement (Chomsky, 1977: 87). Hungarian (20a) and some varieties of English (20b) are examples.

(20) a. Mari gazdagabb, mint (ahogy) gondoltam.
Mari rich.COMP than (how) thought
'Mary is richer than I thought.' (Hungarian; Beck et al., 2009: 43)

b. % John is taller than what Mary (told us that Bill) is. (Chomsky, 1977: 87)

The Vietnamese data available to me generally lack an overt *wh*-word or any overt sign of a degree operator. Fortunately, there are ways to test for degree abstraction without overt operators. Silent operator movement is subject to islands (Chomsky, 1977: 87), so if comparatives that would force movement out of an island are ungrammatical, this would provide evidence for degree abstraction. One type of island that has been tested in a variety of languages is negative islands (Beck et al., 2009). Negative island effects result from degree abstraction across a negative word to create a <*d*,*t*> argument for *-er* and its equivalents in other languages. Thus, languages with degree abstraction like English and Vietnamese show these effects (21).

(21) a. * Anh Tyler đã mua một quyển sách đắt hơn không ai mua.
brother Tyler PST buy one CLF book expensive exc. NEG who buy
Literally: 'Tyler bought a more expensive book than nobody did.' (NBT/NPD)

b. Anh Tyler đã mua một quyển sách đắt hơn ai khác mua.
brother Tyler PST buy one CLF book expensive exc. who other buy
'Tyler bought a more expensive book than anybody else did.' (NBT)

Negative islands in comparatives are a result of semantic uninterpretability, rather than a syntactic restriction on movement. The embedded CP in (21a) has a denotation like the one in (22). This is a <*d*,*t*> argument appropriate for composition with *-er*/*hơn*. However, the maximum of this CP is undefined (von Stechow, 1984; Rullman, 1995; Beck et al., 2004, 2009). There is not a unique highest degree of expensiveness such that nobody bought a book that expensive.

(22) $[\![\text{CP}]\!] = \lambda d_d$.nobody bought a d-expensive book (based on Beck et al., 2009: 11)

Another piece of evidence that Vietnamese has degree abstraction is the existence of scope ambiguities in the interpretation of comparatives with a modal in the matrix clause (Heim, 2000; Beck et al., 2009: 9). If both the matrix DegP and matrix modal can undergo some form of quantifier raising to compose semantically, then one might expect that the landing sites can be ambiguous relative to one another, leading to possible ambiguity in interpretation. In (23), varying the relative scopes of the modal *phải* 'must' and DegP produces distinct readings.

(23) a. Bây giờ bài viết dài mười trang. Giáo sư nói là bài viết phải dài hơn đúng
now essay long ten page professor say C essay must long exc. exact
năm trang.
five page
'Now the essay is 10 pages long. The professor says that the essay must be exactly 5 pages longer.' (cf. Heim, 2000: 48)

b. ✓ must > DegP $\forall w \in \text{Acc}$: max{d: the essay is d-long in w} = 15 pages
'The essay must be exactly 15 pages long and no more.'

c. ✓/? DegP > must max{d: $\forall w \in \text{Acc}$: the essay is d-long in w} = 15 pages
'The essay must be at least 15 pages long.' (NPD)

2.4. Evidence for the overt filling of degree argument positions (+DegPP)

So far, I have presented evidence that Vietnamese has degrees (+DSP) and degree abstraction (+DAP), and the data fit these claims quite cleanly. The evidence that Vietnamese allows the overt filling of the degree argument position of a gradable predicate (+DegPP) is a bit less clear-cut. Nevertheless I will argue that Vietnamese does indeed allow it.

If one assumes a structure for comparative sentences along the lines of the one in (18), then DegP is an argument of a gradable predicate (*tall* in that case). In some languages, DegP may be filled overtly in the syntax, but in others, there appears to be a restriction against this. Phrases that can fill DegP in English include degree question phrases (24a), measure phrases (24b), and degree traces from degree operator movement (24c) (Beck et al., 2009: 24).

(24) a. $[_{AP}\ [_{DegP}$ How$]\ [_{A}$ tall$]]$ is John?
b. John is $[_{AP}\ [_{DegP}$ 6 feet$]\ [_{A}$ tall$]]$.
c. John is taller than $[_{CP}\ \lambda d_{d}$ the car is $[_{AP}\ [_{DegP}\ t_{d}]\ [_{A}$ long$]]]$.

As noted above, the Vietnamese data are a bit ambiguous in showing whether or not the language allows DegP to be overtly filled. Vietnamese allows degree questions (25) and direct measure phrases (26), but subcomparatives are often ungrammatical (4a, repeated as 27).

(25) a. Philip cao bao nhiêu?
Philip tall how much
'How tall is Philip?' (NBT)

b. Cô ấy đẹp cỡ nào?
aunt that beautiful size which
'How beautiful is she?' (PK)

c. Cái phim điện ảnh này dài bao nhiêu?
CLF film cinema this long how much
'How long is this film?' (NBT)

(26) a. Philip cao một thước chín mươi.
Philip tall one meter nine ten
'Philip is 1.90 meters tall.' (NBT)

b. Cô ấy đẹp cỡ Emma Watson.
aunt that beautiful size Emma Watson
'She's Emma Watson beautiful.' (PK)

c. Cái phim điện ảnh này dài ba giờ.
CLF film cinema this long three hour
'This film is 3 hours long.' (NBT)

(27) * Cái bàn dài hơn cái ghế cao.
CLF table long exc. CLF chair tall
Int. 'The table is longer than the chair is tall.' (NPD, PK)

Despite the ungrammaticality of subcomparatives like (27), the possibility of degree questions (25) and direct measure phrases (26) indicates that DegP can be overtly filled in Vietnamese. I will ultimately depart from the syntax assumed in Beck et al. (2009), assuming instead that predicates that combine with degrees directly are arguments of Deg, rather than the reverse. Regardless, it is clear that degree expressions can co-occur overtly with gradable predicates.

2.5. Section summary

In this section I have shown that Vietnamese has clausal comparison, degrees (+DSP), and degree abstraction (+DAP) and allows gradable predicates to co-occur overtly with degree expressions (+DegPP). The evidence for clausal comparison, degrees, and degree abstraction is

clear and matches closely with data in other languages. The evidence that degree expressions may co-occur overtly with gradable predicates comes most directly from degree questions and measure phrases. All of these facts about the grammar of degrees in Vietnamese predict the general availability of subcomparatives, but, as noted above, many subcomparatives are ungrammatical. In fact, the data on subcomparatives are complicated, and a full treatment of these data is in order. The next section discusses Vietnamese subcomparatives in more detail.

3. Vietnamese subcomparatives

As noted above, many subcomparatives are ungrammatical in Vietnamese, but there are also some that are grammatical for some speakers only and others that are grammatical for all speakers. In this section the data are presented in greater detail. First, some examples of subcomparatives that are ungrammatical for all speakers consulted are provided in (28)-(29).

(28) a. * Cái bàn dài hơn cái ghế cao.
CLF table long exc. CLF chair tall
Int. 'The table is longer than the chair is tall.' (*NPD/PK, similar example rejected by NBT and BQL)

b. Chiều dài của cái bàn hơn chiều cao của cái ghế.
direction long of CLF table exc. direction tall of CLF chair
'The length of the table exceeds the height of the chair.' (✓NPD)

(29) a. * Tôi cao hơn xe hơi dài.
1SG tall exc. car long
Int. 'I'm taller than the car is long.' (*NPD/PK)

b. Tôi cao hơn chiều dài của xe hơi.
1SG tall exc. direction long of car
'I'm taller than the length of the car.' (✓NPD)

In (28), the ungrammatical subcomparative (28a) is repaired by nominalizing both of the gradable predicates (28b). (29) shows that only the gradable predicate in the standard needs to be nominalized. These examples are perhaps the closest to the examples of subcomparatives from other languages seen in the literature, which compare two physical-dimension predicates with maxima on the positive ends of their scales. The repairs show that the intended meanings of these subcomparatives are clear to speakers, but they cannot be expressed as subcomparatives.

The next set of subcomparatives are those that are subject to speaker variation. The examples in (30) feature a different set of predicates more subjective than the ones in (28)-(29); the scales for beauty and happiness are less clear than the scales for length and height. These examples are not perfect to consultant NPD, but they are judged grammatical. Consultant PK rejects them.

(30) a. % Mary vui hơn John buồn.
Mary happy exc. John sad
'Mary is happier than John is sad.' (✓NPD, *PK)

b. % John xấu hơn Mary đẹp.
John ugly exc. Mary beautiful
'John is uglier than Mary is beautiful.' (✓NPD, *PK)

The last set of subcomparatives (31) is considered acceptable by all speakers consulted. These involve transitive verbs, and though that certainly differentiates them syntactically, I would argue that these are still subcomparatives, because both predicates being compared are present overtly. In (31a), degrees of liking are being compared, and in (31b), a degree of liking is being compared to a degree of hating. This is different from an example like (7b), repeated as (32), where degrees of loudness are being compared, but the embedded *ồn* 'loud' has elided.

(31) a. Phoebe thích hoá học hơn là Tyler thích toán.
Phoebe like chemistry exc. C Tyler like math
'Phoebe likes chemistry more than Tyler likes math.' (✓NPD/PK)

b. Phoebe thích hoá học hơn là Tyler ghét toán.
Phoebe like chemistry exc. C Tyler hate math
'Phoebe likes chemistry more than Tyler hates math.' (✓NPD/PK)

(32) Phoebe hát ồn hơn (là) Tyler huýt sáo ~~*d*-ồn~~.
Phoebe sing loud exc. (C) Tyler whistle ~~*d*-loud~~
'Phoebe sang louder than Tyler whistled ~~*d*-loud~~.' (NPD)

Given the evidence that Vietnamese is +DSP, +DAP, and +DegPP and allows clausal standards, it is surprising that some subcomparatives are ungrammatical (28a, 29a). It is less surprising typologically that other subcomparatives are acceptable (31), though some of them only to some speakers (30). There is also the puzzle internal to Vietnamese of explaining this distribution, both accounting for ungrammaticality and allowing for variation. The next section describes the distribution of *nhiều* 'much, many', revealing intriguing differences between the predicates shown in the subcomparatives in this section and paving the way towards an analysis.

4. Towards an analysis: The distribution of *nhiều* 'much, many'

The word *nhiều* 'much, many' plays an important role in the grammar of degrees in Vietnamese. Its use with a predicate correlates with the ability of that predicate to remain in the standards of comparatives and form subcomparatives. This section illustrates this correlation with data on nominal comparatives and intensification with *rất* 'very' and *rất nhiều* 'very much'.

Nominal comparatives in Vietnamese, in addition to using *hơn* 'exceed', are formed with *nhiều* 'much, many' preceding the matrix-clause noun that it measures. Notably, *nhiều* cannot be present in the standard, but everything else can be, including the measured noun (33a-33c). On the other hand, *nhiều* must be present in the matrix clause (33c). There is a preference for eliding other identical material in the standard (33d), but only *nhiều* absolutely must elide.

(33) a. Lan đã ăn nhiều phở hơn Thoa ăn cơm chiên.
Lan PST eat much pho exc. Thoa eat rice fry
'Lan ate more pho than Thoa ate ~~*d*-much~~ fried rice.' (NPD)

b. Nhiều sinh viên học lịch sử hơn giáo sư học tâm lý học.
much student study history exc. professor study psychology
'More students study history than ~~*d*-many~~ professors study psychology.' (NPD)

c. Thoa mua *(nhiều) nhà hơn Vũ mua (*nhiều) xe hơi.
Thoa buy *(much) house exc. Vũ buy (*much) car
'Thoa bought more houses than Vũ bought ~~*d*-many~~ cars.' (NPD)

d. Nhiều sinh viên học lịch sử hơn (*nhiều) (?sinh viên) học tâm lý học.
much student study history exc. (*much) (?student) study psychology
'More students study history than ~~*d*-many students~~ study psychology.' (NPD)

Perhaps the most interesting data on *nhiều* 'much, many' in light of the subcomparative data concern the possibility of intensification with *rất* 'very' and *rất nhiều* 'very much'. *rất* must precede phonological material, either *nhiều* or a predicate if *nhiều* is absent.

All the predicates for which subcomparative data were presented (28-31) can be intensified with a preceding *rất* 'very', but not all of them can be intensified with a following *rất nhiều* 'very much'. The availability of intensification with a following *rất nhiều* 'very much' correlates with the possibility of forming a subcomparative with that predicate. (34) presents predicates that all speakers reject in subcomparatives: *cao* 'tall' and *dài* 'long'. These predicates allow preceding *rất* 'very' (34a,b) but not following *rất nhiều* (34c,d).

(34) a. Tôi rất cao.
1SG very tall
'I'm very tall.' (✓NPD/PK)

b. Cái ghế rất dài.
CLF chair very long
'The chair is very long.' (✓NPD/PK)

c. * Tôi cao rất nhiều.
1SG tall very much
Int. 'I'm very tall.' (*NPD/PK)

d. * Cái ghế dài rất nhiều.
CLF chair long very much
Int. 'The chair is very long.' (*NPD/PK)

(35) presents predicates that are possible in subcomparatives for consultant NPD but not consultant PK: *vui* 'happy' and *đẹp* 'beautiful'. Both speakers accept these predicates with preceding *rất* 'very' (35a,b), but only NPD accepts them with following *rất nhiều* 'very much' (35c,d).

(35) a. Tôi rất vui.
today 1SG very happy
'I'm very happy.' (✓NPD/PK)

b. Mary rất đẹp.
Mary very beautiful
'Mary is very beautiful.' (✓NPD/PK)

c. % Tôi vui rất nhiều.
1SG happy very much
'I'm very happy.' (✓NPD, *PK)

d. % Mary đẹp rất nhiều.
Mary beautiful very much
'Mary is very beautiful.' (✓NPD, *PK)

(36) presents predicates that all speakers accept in subcomparatives: *thích* 'like' and *ghét* 'hate'. As expected, both *rất* 'very' and *rất nhiều* 'very much' are acceptable to all speakers consulted.

(36) a. Tôi rất thích Phoebe.
1SG very like Phoebe
'I really like Phoebe.' (✓NPD/PK)

b. Tôi rất ghét Phoebe.
1SG very hate Phoebe
'I really hate Phoebe.' (✓NPD/PK)

c. Tôi thích Phoebe rất nhiều.
1SG like Phoebe very much
'I really like Phoebe.' (✓NPD/PK)

d. Tôi ghét Phoebe rất nhiều.
1SG hate Phoebe very much
'I really hate Phoebe.' (✓NPD/PK)

Before moving on, I should note that not all verbal predicates can be intensified with a preceding *rất* 'very'. Descriptively, this is only possible for stative verbs[3]. Active verbs like *ăn* 'eat' and *hát* 'sing' require *nhiều* 'much' (37). They must also use *nhiều* in comparatives (38).

(37) a. * Tôi rất ăn phở.
1SG very eat pho
Int. 'I eat pho a lot.' (NPD)

b. * Tôi rất hát.
1SG very sing
Int. 'I sing a lot.' (NPD)

c. Tôi ăn phở rất nhiều.
1SG eat pho very much
'I eat pho a lot.' (NPD)

d. Tôi hát rất nhiều.
1SG sing very much
'I sing a lot.' (NPD)

[3]Vietnamese does not make a true distinction between adjectives and verbs. More accurately, verbs could be classified as active or stative. Stative verbs include many lexical items translated as adjectives in English (Thompson, 1965: 217; Lê and Nguyễn, 2013: 85).

(38) a. Tôi ăn *(nhiều) hơn Phoebe.
1SG eat *(much) exc. Phoebe
'I ate more than Phoebe.' (NPD)

b. Tôi hát *(nhiều) hơn Phoebe (hát).
1SG sing *(much) exc. Phoebe (sing)
'I sing more than Phoebe (sings).' (NPD)

The key generalization that emerges from the data presented in this section is that predicates that can be modified by *nhiều* 'much, many' for intensification or in comparatives can remain in the standard following *hơn* 'exceed, -er'. Nouns are modified by *nhiều* in nominal comparatives, so they can remain in the standard. In addition, verbs that can be intensified by *rất nhiều* 'very much' can remain in the standard of (sub)comparatives, and the variation seen in the acceptability of some subcomparatives (30) correlates with this across speakers. These correlations reveal the importance of *nhiều* in Vietnamese degree constructions. In fact, *nhiều* is often necessary (33, 37-38). An analysis of these constructions should account for *nhiều*'s distribution and contribution to the grammar of degrees in Vietnamese. In the following section, I propose an analysis of Vietnamese subcomparatives and degree constructions more broadly in which *nhiều* and its silent counterpart μ serve as intermediaries between predicates and degrees.

5. Subcomparatives and the grammar of degrees in Vietnamese

In this section I present my analysis of the grammar of degrees in Vietnamese. This includes two parts. The first concerns the ways different predicates combine with degree expressions and crucially how they can differ from one another. The second concerns the nature of comparative deletion in Vietnamese and how to determine what must elide and what may remain overt.

5.1. Proposal part 1: Vietnamese predicates and degrees

Data in the previous section showed that Vietnamese predicates, here meaning both verbs and nouns, differ in their compatibility with *nhiều* 'much, many'. Some predicates like *cao* 'tall' and *dài* 'long' are incompatible with *nhiều* for intensification. Some like *thích* 'like' and *ghét* 'hate' are compatible with *nhiều* for intensification but do not require it. Some like *vui* 'happy' and *đẹp* 'beautiful' are subject to speaker variation, behaving like *cao* and *dài* for some speakers but like *thích* and *ghét* for others. Finally, some like *hát* 'sing' and *ăn* 'eat' require *nhiều*. The verbal predicates that require *nhiều* for intensification pattern with nouns like *sinh viên* 'student' (and others) in that they additionally require *nhiều* in comparatives. Thus, the broad generalization that emerges from this is that some predicates need *nhiều* to interact with and make reference to degrees, others do not need *nhiều*, and others can optionally use *nhiều*.

I propose that this variation in the behavior of predicates is due to differences in how predicates interact with degrees. Some predicates can combine directly with degree expressions, i.e. a Deg/DegP of type *d* or that leaves a trace of type *d*. In line with the traditional analysis (von Stechow, 1984; Heim, 2000; Beck et al., 2009; among others), I will assume that such predicates denote a relation between individuals and degrees (type <*d*,*et*>). Predicates of this nature include *cao* 'tall' and *dài* 'long' as well as some not discussed in this paper like *nặng* 'heavy' and *nóng* 'hot'. Denotations are given below with English meta-language (39).

(39) a. $[\![\text{cao}]\!] = \lambda d_d.\lambda x_e.\text{tall}(x) \geq d$ b. $[\![\text{dài}]\!] = \lambda d_d.\lambda x_e.\text{long}(x) \geq d$

Other predicates need *nhiều* 'much' in order to combine with degree expressions. I propose that predicates that always need *nhiều* like *hát* 'sing', *ăn* 'eat', and *sinh viên* 'student' have typical denotations like those in (40), as predicates of type <*e*,*t*> or <*e*,*et*>.

(40) a. $[\![\text{hát}]\!] = \lambda x_e.\text{x sings}$
b. $[\![\text{ăn}]\!] = \lambda x_e.\lambda y_e.\text{y eats x}$
c. $[\![\text{sinh viên}]\!] = \lambda x_e.\text{x is a student}$

What about the predicates that combine with *nhiều* in some cases but not others, predicates like *vui* 'happy' and *đẹp* 'beautiful' for consultant NPD, and *thích* 'like' and *ghét* 'hate'? These are like the predicates in (40) in that they are also unable to combine directly with degree expressions, but I propose that these are measure functions (Kennedy, 1997; Svenonius and Kennedy, 2006) of type <*e*,*d*> or <*e*,*ed*> (41). These predicates take in an entity and return the degree to which that entity embodies the predicate, rather than returning a truth value.

(41) a. $[\![\text{vui}_{[\text{M}]}]\!] = \lambda x_e.\text{happy(x)}$
b. $[\![\text{đẹp}_{[\text{M}]}]\!] = \lambda x_e.\text{beautiful(x)}$
c. $[\![\text{thích}]\!] = \lambda x_e.\lambda y_e.\text{like(x)(y)}$
d. $[\![\text{ghét}]\!] = \lambda x_e.\lambda y_e.\text{hate(x)(y)}$

Speakers like consultant PK who reject *vui* 'happy' and *đẹp* 'beautiful' with *nhiều* presumably analyze these as <*d*,*et*> functions that combine directly with degree expressions (42). The two versions of these predicates are distinguished with the diacritics M (measure) and R (relation).

(42) a. $[\![\text{vui}_{[\text{R}]}]\!] = \lambda d_d.\lambda x_e.\text{happy(x)} \geq d$
b. $[\![\text{đẹp}_{[\text{R}]}]\!] = \lambda d_d.\lambda x_e.\text{beautiful(x)} \geq d$

With all of these pieces in place, this leaves the question of how the non-<*d*,*et*> predicates compose with degree expressions. Following Bresnan (1973), Svenonius and Kennedy (2006), Grano and Kennedy (2012), and Wellwood (2012) (among others), I propose that an extra morpheme must mediate between these predicates and degree expressions. This morpheme is often realized overtly as *nhiều* 'much, many'. For the <*e*,*d*> and <*e*,*ed*> predicates, *nhiều* comes in two versions: the overt version that is now quite familiar (*nhiều*$_{[M]}$), and a silent version, which I will label μ, following the label used by Grano and Kennedy (2012) for the functionally similar silent morpheme that they posit. For the <*e*,*t*> and <*e*,*et*> predicates, I propose that these also combine with *nhiều*, albeit a version with a slightly different denotation. There is no silent counterpart μ for this version of *nhiều*, which I will label *nhiều*$_{[ET]}$, because it takes in <*e*,*t*> arguments. One can conceptualize these lexical items as being something like applicatives for degrees, introducing a degree argument to a predicate that does not have one by default. Denotations for *nhiều*$_{[M]}$/μ and *nhiều*$_{[ET]}$ are provided in (43).

(43) a. $[\![\text{nhiều}_{[\text{M}]}]\!]/[\![\mu]\!] = \lambda d_d.\lambda G_{<e,d>}.\lambda x_e.\text{G(x)} \geq d$
b. $[\![\text{nhiều}_{[\text{ET}]}]\!] = \lambda d_d.\lambda F_{<e,t>}.\lambda x_e.\text{F(x)} \,\&\, \text{Meas(F(x))} \geq d$

(43b) contains a function Meas. What is Meas? It is a function that takes in a predicate and returns a degree based on the most salient scale on which that predicate can be measured. For (plural) count nouns this is cardinality; for a verb like 'run' it may be distance or time. Due to space and scope limitations, I do not elaborate on the nature of Meas in this paper. The important thing is that it converts an <*e*,*t*> predicate into a degree on a scale. This denotation for *nhiều*$_{[ET]}$ is loosely based on a semantically similar operator discussed in Rett (2018).

Finally, a denotation for *rất* 'very' is provided in (44). The truth conditions of *rất* are such that the maximum degree to which an individual embodies a predicate Q is much greater ($\gg$) than the contextual standard for an individual to embody that predicate (Stnd_{Q}), an idea loosely based on Katz (2005). It is perhaps a bit strange to treat *rất* as a degree quantifier like *hơn* 'exceed', but this allows for a uniform denotation for *rất* despite the differences in the semantic types of predicates and the fact that some predicates combine with *nhiều*/μ 'much'.

(44) $[\![\text{rất}]\!] = \lambda Q_{<d,t>}.\text{max(Q)} \gg \text{Stnd}_{\text{Q}}$

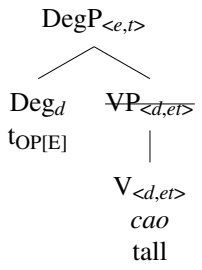
5.2. Proposal part 2: Vietnamese comparative deletion

The differences described above in how predicates combine with degree expressions interact with a mandatory deletion operation in the standards of comparatives. This deletion operation is licensed by OP, the *wh*-element that undergoes degree abstraction in standards to create a <*d*,*t*> argument for *-er*/*hơn*. OP has the features shown in (45); it is a Deg head of type *d*, +*wh* but not used in questions (−Q). The +*wh* feature puts OP in line with its overt instantiation found in some English dialects (Chomsky, 1977: 87) and other languages (Beck et al., 2009: 43-44), and the −Q feature distinguishes it from the Deg head used in degree questions. The crucial feature is the ellipsis (E) feature (Merchant, 2008), which allows OP to license ellipsis of its complement. The E feature is always present, so OP always forces ellipsis.

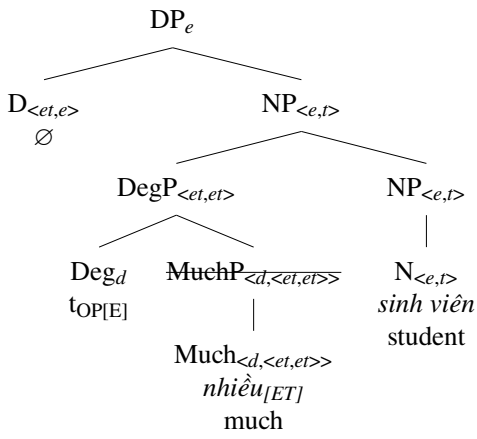
(45) OP = [Deg, *d*, +*wh*, −Q, E]

I propose the structures in (46) for combinations of Deg, VP or NP, and *nhiều*/μ 'much' in the standards of comparatives. The idea that a word like *much* mediates the relation between a predicate and degree phrase has been suggested before by Bresnan (1973) and Wellwood (2012). Grano and Kennedy (2012) suggest something similar, but with a different syntax.

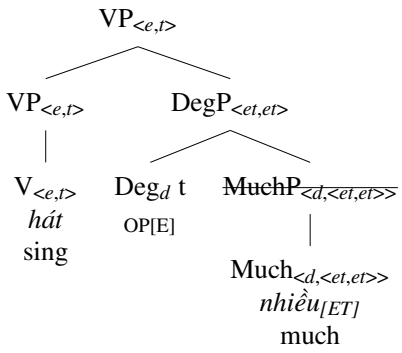
(46) a.



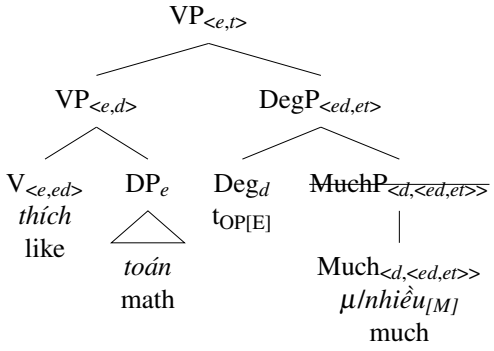
b.



c.



d.



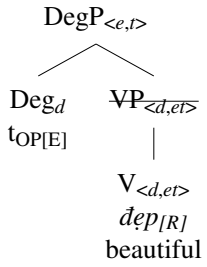
These structures represent a small but syntactically significant departure from the structure in (18). There, the gradable predicates take DegP as an argument. In these structures, partly inspired by Kennedy (1997), Deg serves as a head that takes gradable predicates and *nhiều*/μ 'much' as arguments. The change in syntactic structure does not affect the semantics. Despite the difference in headedness, the order in which the constituents combine remains the same.

Deg takes whatever it combines with first as its complement, and this allows us to capture the contrasts in the behavior of different predicates. In some structures, like (46a) with *cao* 'tall', Deg is able to combine directly with the predicate. Thus, the predicate is Deg's complement, and the mandatory deletion operation applies to this predicate (shown via the strikeout of ~~VP~~).

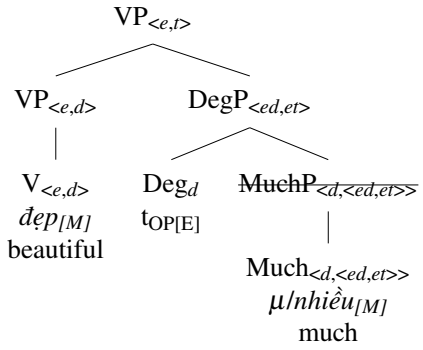
Deleting this predicate is acceptable if it is identical to an antecedent in the matrix clause syntactically and semantically (*e-given* in the terminology of Merchant, 2008). If this predicate is not identical to an antecedent in the matrix clause, as in a subcomparative, then it cannot be elided. This creates a conflict with the mandatory deletion operation, causing a crash.

By contrast, predicates like *sinh viên* 'student' (46b), *hát* 'sing' (46c), and *thích* 'like' (46d) do not combine directly with Deg, so Deg combines instead with a MuchP headed by *nhiều*/μ 'much'. Thus, MuchP, rather than VP or NP, is the complement of Deg. Deg only forces its complement to elide, so MuchP must elide, but the predicate can remain. Under this account, the variation in the possibility of subcomparatives with predicates like *đẹp* 'beautiful' is the result of some speakers treating it as a <*d*,*et*> predicate that combines directly with Deg (47a) and other speakers having *nhiều*/μ in the structure (47b). *đẹp* must elide if it is the complement of Deg, ruling out subcomparatives, but it may remain if *nhiều*/μ is the complement of Deg.

(47) a.



b.



5.3. The nominalization repair for ungrammatical subcomparatives

Attributing the mandatory deletion operation to an ellipsis (E) feature on the Deg head OP leads to a straightforward account of why nominalizing (at least) the predicate in the standard is a possible repair for ungrammatical subcomparatives. As a preliminary, an ungrammatical subcomparative and a possible repair are provided in (29), repeated as (48).

(48) a. * Tôi cao hơn xe hơi dài.
1SG tall exc. car long
Int. 'I'm taller than the car is long.'
(*NPD/PK)

b. Tôi cao hơn chiều dài của xe hơi.
1SG tall exc. direction long of car
'I'm taller than the length of the car.'
(✓NPD)

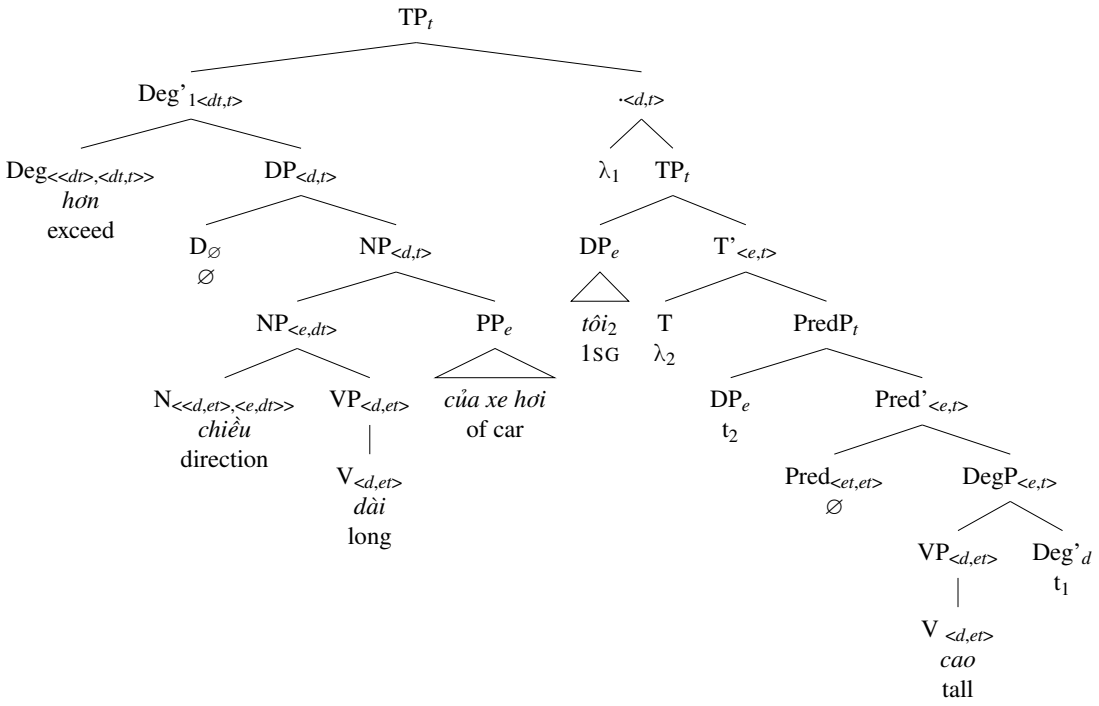
Interestingly, nominalizing predicates is also the repair strategy to express the meanings of subcomparatives in languages without degree abstraction like Mandarin (Erlewine, 2018) and Luganda (Bochnak, 2018). This suggests that nominalization allows one to avoid degree abstraction. Of course, Vietnamese has degree abstraction, so it does not need this repair for the same reason, at least not directly. However, because nominalization avoids degree abstraction, it also avoids OP. If OP is absent, then it will not force elision of gradable predicates.

I follow Bochnak (2018) in attributing a type-shifting role to the morphemes that nominalize gradable predicates. More specifically, a word like *chiều* 'direction' takes in a <*d*,*et*> predicate and converts it into an <*e*,*dt*> one (49). The nominalized predicate (type <*e*,*dt*>) then combines with the entity to which its property applies, resulting in a nominalization of type <*d*,*t*> appro-

priate for composition with *hơn* 'exceed'. A <*d*,*t*> predicate is derived in the standard without the need for degree abstraction and thus without the need for OP. This is illustrated in (50).

(49) $[\![\text{chiều}]\!] = \lambda G_{<d,et>}.\lambda x_e.\lambda d_d.G(x) \geq d$

(50)



The nominalization repair highlights the role of OP in licensing the mandatory deletion operation in Vietnamese. The matrix Deg head *hơn* 'exceed' does not force elision of its complement (the standard). It is also not the case that certain predicates are inherently incompatible with remaining in the standards of comparatives. Rather, predicates that combine directly with Deg can serve as complements of OP, making them potential targets for deletion. Other predicates avoid deletion due to their inability to combine directly with Deg and serve as complements of OP, but predicates that combine directly with Deg can only avoid deletion if OP is absent. Nominalization of the standard resolves this issue by removing OP from the structure.

6. Conclusion

This paper began with a presentation of different degree constructions in Vietnamese to show that the language has clausal standards, has degrees in its semantics (+DSP), has degree abstraction (+DAP), and allows gradable predicates to co-occur overtly with degree expressions (+DegPP). Next it showed that despite these parameter settings and the possibility of clausal standards, many subcomparatives are ungrammatical, though some are possible, subject in some cases to speaker variation. After that it discussed nominal comparatives, comparatives with non-stative verbs, and patterns of intensification with *rất* 'very' and *rất nhiều* 'very much' to show that the possibility of remaining in the standard of a comparative is connected to the possibility of interacting with *nhiều* 'much' in these constructions. This led to an analysis that accounts for variation among predicates with regards to their permissibility in subcomparatives by positing that some predicates combine directly with degrees as complements of Deg, while in other cases Deg must first combine with a MuchP complement headed by *nhiều* or its silent

counterpart μ before combining with a predicate. Vietnamese comparative deletion, licensed by the Deg head OP, forces the complement of OP to elide in the standards of comparatives, allowing predicates to remain only when they do not serve as complements of OP.

So what are the major take-aways from this analysis? First, the availability of subcomparatives in a language does not follow purely from having clausal standards and +DSP, +DAP, and +DegPP parameter settings. In addition to these factors, comparative deletion must not force gradable predicates to elide. Second, a single language may manifest multiple strategies for combining predicates with degrees, even among predicates that seem to belong to the same syntactic category. Vietnamese exhibits three classes of predicates regarding their semantics and their interaction with degrees: 1. predicates that combine directly with degrees (<*d*,*et*>), 2. predicates that are gradable but cannot combine directly with degrees (<*e*,*d*>/<*e*,*ed*>), and 3. predicates that are not (inherently) gradable and also cannot combine directly with degrees (<*e*,*t*>/<*e*,*et*>). These differences result in crucial structural differences that interact with comparative deletion, affecting whether or not a particular predicate is possible in subcomparatives.

This analysis raises the question of why +DSP/+DAP/+DegPP languages with clausal standards, like English, generally allow subcomparatives without exhibiting the differences between predicates seen in Vietnamese. This analysis suggests two possibilities: 1. All the gradable predicates in languages that tolerate all subcomparatives are measure functions (type <*e*,*d*> or <*e*,*ed*>). These predicates always combine with an element like *much*/μ (Bresnan, 1973; Wellwood, 2012). Because *much*/μ always mediates the relationship between these predicates and degrees, these predicates never serve as complements of OP. Though elements that combine directly with OP may be forced to elide in standards, like *much* in English nominal comparatives, predicates are only subject to more general preferences against repeating material. +DSP/+DAP/+DegPP languages with clausal standards that accept no subcomparatives at all only have gradable predicates that combine directly with degrees (type <*d*,*et*>). Vietnamese is atypical in that it mixes predicate types. 2. Comparative deletion in English-like languages does not target gradable predicates, either because Deg does not force its complements to elide, or because Deg does not take these predicates as complements. Perhaps OP has an E feature in some languages and lacks it in others. Alternatively, languages vary in whether Deg takes gradable predicates, with or without *much*/μ, as complements, or whether predicates take DegP arguments. I leave the exploration of these possibilities to future work.

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