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Null Operators and Parameter Setting

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Null Operators and Parameter Setting

Ryosuke Hattori, Ph.D.

University of Connecticut, 2019

This thesis investigates cross-linguistic variation regarding null operator (Op) movement constructions, in particular comparatives and *tough* constructions, focusing on their syntactic structure and their acquisition by children. Chapter 2 discusses the mechanism of Op movement involved in clausal comparatives. Based on the labeling algorithm of Chomsky (2013), I argue that just like overt *wh*-phrase can project after movement, so can Op. I also show that the Op projection has a distributional restriction, i.e. it has to be in the complement position of a preposition. To account for this, I argue that Op lacks ϕ -features but has an uninterpretable Case feature, which is checked by inherent Case assignment from a preposition like *than* through a head-complement relation. Chapter 3 focuses on cross-linguistic variation regarding complement selection of the comparative preposition *than*. Conducting a cross-linguistic survey on the availability of 10 different types of comparatives in 15 languages, I show that some languages do not allow a clausal comparative when degrees of adjectives are compared (DCC). I then show that there is a common property among such languages and propose a hitherto unnoticed correlation with a parametric variation concerning the NP/DP parameter (Bošković 2008a). The generalization established is that DCC may be possible in a language only if it is also a DP language (a language with articles). Chapter 4 proposes an explanation for this generalization. I claim that the Op is bare, i.e. non-branching, in NP languages, as a result of which it gets frozen in the base position when it is in the complement position of an inherent Case assigning head like A, while in DP languages this is not the case since the Op has a more complex structure with an extra projection, which prevents the

freezing effect. Chapter 5 explores whether the variation regarding Op between NP languages and DP languages holds in other domains, focusing on *tough* constructions. I conduct a survey of 7 DP-languages and 6 NP-languages, which reveals that English-type *tough* constructions are possible only in DP languages. Following Hicks (2009), I claim that a complex null operator (CNO) is involved in English-type *tough* constructions; it smuggles the nominative subject, which is dominated by the CNO. Crucially, for the smuggling to take place, there has to be a DP layer in the CNO. Chapter 6 considers language acquisition by setting the parameter for two types of null operators discussed in the previous chapters (i.e. bare or CNO). If children acquiring a DP-language need to set a parameter before they start using the CNO with the DP layer, then the constructions involving CNO should be delayed based on the Subset Principle (Manzini and Wexler 1987). In this regard, I show that the acquisition of DCC and *tough* constructions is indeed delayed in the acquisition of English.

Null Operators and Parameter Setting

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APPROVAL PAGE

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Chapter 1

Introduction

1.1. Main Questions and Goals

In this thesis, I will mainly investigate two constructions which have been traditionally (e.g. Chomsky 1977) assumed to involve null operator (Op) movement: comparative clauses and *tough* construction. These constructions are illustrated below with respect to English and Japanese. Here, Op indicates the position of a null operator, and *t* marks its trace.

(1) Clausal Comparatives

a. John wrote more books than [Op_i Mary read *t_i* magazines]

b. The desk is as high as Op it is *t_i* wide (English)

c. Taro-wa [Hanako –ga *t_i* zassi –o yon-da Op_i] yori ooku-no hon –o kai-ta

Taro-Top Hanako –Nom magazine -Acc read-Pst than many-Gen book –Acc write-Pst

‘Taro wrote more books than Hanako read magazines’ (Japanese)

(2) *Tough* Construction

a. John is easy Op_i PRO to please *t_i* (English)

b. John_i-ga Op_i PRO *t_i* yorokobase yasu –i

–Nom please easy –Pres

‘John is easy to please’ (Japanese)

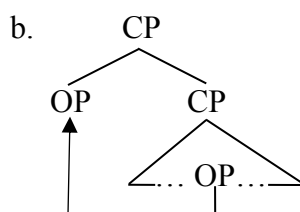
I will discuss cross-linguistic availability of such constructions, their syntactic structures, the properties of the Op in such constructions (i.e. where it is base-generated, where it moves to and what happens after the movement), as well as their acquisition by children.

Locality effects associated with islandhood have been considered to be an indication of *wh*-movement since Ross (1967). The movement of the Op in clausal comparatives and *tough* construction is sensitive to islands, as illustrated in (3) with respect to the complex NP constraint: Op cannot move out of a complex NP.

- (3) a. *John is more intelligent than Op_i Mary believes [_{NP} the claim [that Bill is t_i]].
 b. *This kind of crime is easy Op_i PRO to search [_{NP} a man [who committed t_i]].

As a result, the movement of the null operators in clausal comparatives and *tough* constructions has been considered to be parallel to overt *wh*-movement as in (4), where the operator moves to the specifier of CP.

- (4) a. [_{CP} what_i [_{C'} did John say t_i]]?



However, there are also some differences in the case of Op movement in clausal comparatives. For example, the relevant clause has a DP-like interpretation, i.e. the comparative clause in (5) can be interpreted as “the amount of books that Bill bought.”

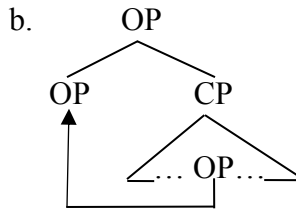
(5) John bought more books than [Op_i Bill did t_i].

Also, the comparative clause in Japanese shows some properties of relative clauses in Japanese (Sudo 2009, 2015), e.g. the comparative clause patterns with relative clauses with respect to the possibility of adnominal inflection and nominative/genitive Case conversion of the subject. In light of this, the comparative clause can be analyzed as a relativized NP with a null head noun.

(6) John-wa [_{NP} [_{CP} Mary-ga t_i katta Op_i] [_N \emptyset]] yori takusan-no hon-o katta
John-Top Mary-Nom bought than many-Gen book-Acc bought
'John bought more books than Mary did'

However, unlike other relative clauses, the comparative clause cannot be located in a subject or in an object position; it is confined to the complement position of the preposition *than*. In this dissertation, then, I will argue for a new analysis of comparative clauses which is intended to capture this restriction based on Cecchetto and Donati's (2015) idea that an operator can project after movement and the labeling theory by Chomsky (2013). Cecchetto and Donati argue that in free relatives like (7a), the *wh*-word, a bare D head, moves and provides a label when it internally merges with CP, so that the resulting structure *what you read* becomes, and is interpreted as, a DP in (7a).

(7) a. I read [DP [D what_i]][CP you read t_i]]?

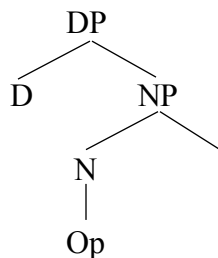


I will argue that the moving null Op in clausal comparatives is also a bare head which projects when it is merged with the CP in its moved position. Regarding the distributional restriction noted above, where the Op projection has to be in the complement position of P in comparatives, I will propose an account of this restriction based on the Activation Condition (Chomsky 2000) and an idea that movement is triggered by an uninterpretable feature of the moving element, which is first introduced as Greed by Chomsky (1993) and revived recently in Bošković (2007). In particular, Bošković (2007) argues that the need for a NP/DP (with an uninterpretable Case feature) to check Case can drive the movement of the NP/DP. I argue that the same type of mechanism is involved in the Op movement in comparatives, where the only feature on the Op is an uninterpretable Case feature which has to be checked by inherent Case licensing by the preposition *than*. This requires the Op projection and *than* to establish a head-complement relation.

Another issue that will be discussed in the dissertation concerns cross-linguistic variation in comparatives, which has attracted considerable attention in the semantic literature in recent years (Beck, Oda and Sugisaki 2004; Oda 2008; Beck et al. 2009; Hohaus et al. 2014; among others). It has been argued that the lack of degree clausal comparatives, so called “subdeletion”, in some languages is determined by a parameter regarding whether degree variable can be bound in a language or not (so called Degree Abstraction Parameter, proposed by Beck, Oda and Sugisaki 2004). In this dissertation, I will argue against this parametric view and propose a new account,

based on a cross-linguistic survey of 10 different kind of comparatives in 15 languages, where I found that there is a strong correlation between the availability of certain types of degree clausal comparatives and being a DP-language, assuming the NP/DP parameter by Bošković (2005, 2008a, 2009, 2013 and references therein). The crucial issue here is that languages without articles have been argued not to have the category D, hence the DP projection (Corver 1992; Zlatić 1997; Trenkić 2004; Bošković 2005, 2009, 2012; Marelj 2008, 2011; Despić 2011, 2013; M. Takahashi 2012; Runić 2014; among others). Based on this, I will explain the variation in question by claiming that the Op has a more complex structure in DP-languages while it must be bare in NP-languages, as shown in (8)¹. I will show that the availability of the complex operator is the prerequisite for degree clausal comparatives, hence such comparatives are available only in DP-languages.

(8) a. DP-languages: Op



b. NP-languages: Op = bare



I will further investigate whether this variation in the structure of Op holds in the *tough* construction. The analyses of the *tough* construction have encountered difficulties with at least one of the core theoretical concepts of Case, locality constraints, and θ -role assignment. For instance,

¹ In this dissertation, I will not consider other types of comparatives where Op may not be NP/DP, e.g. adverbial comparatives, where adverbial phrase itself may bring in richer structure for the Op.

(i) Alice ran quicker/more quickly than Bob (walked).

the raising analysis, which involves A-movement of the *tough* subject from the embedded object position (see e.g. Rosenbaum 1967), leads to an issue with Case assignment, i.e. the *tough* subject should not be able to avoid accusative case assignment in the embedded clause.

(9) He_i is easy [_{CP} [_{TP} PRO to please t_i]]. (Raising analysis)

Also, this approach has to explain why the A-movement here can skip another subject position (i.e. the subject of the infinitival clause, PRO). On the other hand, an account based on A'-movement of a null Op (Chomsky 1977) assumes that the *tough* subject is base-generated in situ, which apparently leaves it without a θ -role, since the *tough* predicate is assumed not to assign a θ -role to its subject.

(10) John_i is easy [_{CP} Op_i [_{TP} PRO to please t_i]]. (A'-movement analysis)

Thus, the A'-movement analysis has to explain how a single θ -role assigned by the embedded verb is apparently 'shared' between two arguments, i.e. the null operator in the infinitival clause and the *tough* subject. Postal (1971), Postal and Ross (1971), Rosenbaum (1967) and Brody (1993), on the other hand, propose a composite A/A'-movement analysis by claiming that there is A'-movement of the *tough* subject to the embedded Spec, CP, which is followed by A-movement to the matrix subject position as shown below.

(11) John_i is easy [_{CP} t_i [_{TP} PRO to please t_i]]. (composite A/A'-movement analysis)

However, the issues with this approach concern a Case mismatch (the subject should receive Accusative as an object of the embedded infinitival verb and Nominative as a matrix subject) and Improper Movement, where movement into an A'-position that is followed by A-movement of the same object is typically assumed to be banned as an Improper Movement configuration (See Bruening 2001 and Svenonius 2004).

Hicks (2009) proposes a new analysis which incorporates both A-movement and A'-movement without the above problems of the previous approaches, using smuggling (Collins 2005a, b). He claims that a null operator in *tough* constructions is a *wh*-phrase with a more complex internal structure than is typically assumed, i.e. a complex DP with an internal DP which functions as the *tough* subject, as shown below.

(12) John_j is easy [CP [DP D [NP [N Op] t_j]]_i [TP PRO to please t_i]]. (Complex Op analysis)

Given my claim that the null operator must be bare in NP languages, this CNO analysis of *tough* constructions predicts that *tough* constructions would not be available in NP-languages, since in NP languages Op must be bare and cannot be complex². In order to check this prediction, I conduct a cross-linguistic survey of the availability of *tough* construction in 13 languages, which establishes a correlation between the availability of the *tough* construction and being a DP-language.

Certain predictions are also made regarding acquisition of English comparatives and *tough* construction based on the proposed analysis. I consider language acquisition of comparatives and *tough* construction to involve setting of the parameter for two types of null operators, i.e. whether

² I am putting aside here *tough* constructions with a PP-subject, which will be discussed later.

complex Op is available or not. Thus, when a child who is learning a DP-language like English sets the parameter to a positive value (+ complex Op), he/she can then comprehend/produce degree clausal comparatives (which need the complex Op in its derivation). From this perspective, I will consider the order of acquiring different types of comparatives based on the Subset Principle (Manzini and Wexler 1987), which is a learning method for specifying a markedness hierarchy when alternative values yield languages which are in a subset relation. The subset relation here is crucial to overcome the learnability dilemma (Wexler and Hamburger 1973) that it is not possible (given that only positive data are available) to correct an overgeneralization if the child ever picks a parameter setting which gives too large a language which is a superset of the correct target language s/he is learning. Through an experiment using Truth Value Judgement Task (TVJT; Crain and McKee 1985) on 23 English-learning children, I show that the parametric view from above is plausible. Another prediction to be investigated is that acquisition of *tough* constructions should be delayed, and the same holds for degree clausal comparatives, as they both need the complex Op as a pre-requisite. I will consider this issue by reviewing previous studies and conducting a corpus data analysis.

1.2. Structure of the Dissertation

This dissertation is organized as follows. In Chapter 2, I will discuss the mechanism of null operator (Op) movement involved in clausal comparatives. I will first review the previous analyses of two types of clausal comparatives often referred to as Comparative Deletion (CD) and Comparative Sub-Deletion (CSD) and show that the same Op movement is uniformly involved here. After reviewing previous literature, I will discuss what happens after Op undergoes the movement based on the labeling algorithm from Chomsky (2013). It is standardly assumed that

the target of movement projects, e.g. this happens with *wh*-movement in an interrogative sentence. There are, however, cases where it has been argued that a moved *wh*-phrase projects after it undergoes movement. In the chapter, I will argue that just like overt *wh*-phrase can project after movement, so can Op. Also, I will show that the Op projection has a distributional restriction, i.e. it has to be in the complement position of a preposition. I will also discuss how the Op movement from the base-position is triggered by a feature-checking mechanism based on Chomsky (2000). I will argue that Op lacks ϕ -features but has an uninterpretable Case feature [uK], which is checked by inherent Case assignment from a preposition like *than* through a head-complement relation, which in turn explains the distribution of the Op projection.

In Chapter 3, I will focus on cross-linguistic variation regarding complement selection of the comparative preposition *than*. I will first review the previous literature, which shows that Japanese does not allow a clausal comparative when degrees of adjectives are compared. I will point out that the previous accounts face some problems when we look at other languages and different types of comparatives. In order to better understand the cross-linguistic variation in comparatives, I will conduct a cross-linguistic survey of the availability of 10 different types of comparatives in 15 languages, which shows that other languages exhibit the same pattern as Japanese. I will then show that there is a common property that all these languages share and propose a new correlation with an independent parametric variation concerning the NP/DP parameter (Bošković 2008a). The generalization that I will establish is that degree clausal comparatives may be possible in a language only if it is also a DP language. The survey will also show that one type of degree comparatives, namely, attributive degree CSD, is not allowed in DP languages.

In Chapter 4, I will propose an answer to the question that the previous chapter raises, namely, what makes degree clausal comparatives possible in DP languages while making them impossible in NP languages. The explanation to be given is based on the analysis from Chapter 2, where the null Op involved in clausal comparatives has an uninterpretable Case feature [uK] which triggers its movement in a way where it moves to be Case-licensed by *than* through inherent Case assignment in a sisterhood configuration. The distributional restriction where DP languages allow degree clausal comparatives while NP languages do not is accounted for by arguing that the Op is bare, i.e. non-branching, in NP languages, as a result of which it gets frozen (see Rizzi 2006, 2007) in the base position in NP languages when it is base-generated in the complement position of an inherent Case assigning head like A. In contrast, this is not the case in DP languages since the Op has a more complex structure with an extra projection, which prevents the freezing effect from arising. I will also suggest an explanation for the fact that the CD of the degree attributive clausal comparatives is possible while the CSD version is unavailable in DP-languages.

In Chapter 5, based on the claim outlined in the previous chapters that Op is bare in NP languages, while this is not the case in DP languages, where Op can be part of a more complex structure. I will explore whether this holds in other domains where Op has been argued to be involved, focusing on *tough* constructions. I will claim that the Complex Null Operator (CNO) structure (Hicks 2009) is involved in the *tough* construction in English, with the smuggling of the nominative *tough* subject. This analysis resolves the problems of the previous analyses by blocking the *tough* subject from receiving Case in the embedded clause; the CNO smuggles the subject with respect to Case-assignment, also avoiding improper movement. Crucially, for the smuggling to take place, there has to be a DP layer with uninterpretable features above bare Op. Based on this, a prediction is made that *tough* construction will be possible only in DP languages. In order to

confirm the prediction, I conduct a survey of 7 DP-languages and 6 NP-languages, which shows that the *tough* construction is in fact possible only in DP languages³. In order to explain the cross-linguistic variation regarding the *tough* construction, I will modify Hicks' (2009) analysis and attribute the lack of (English-like) *tough* constructions in NP-languages to Op not having any uninterpretable features (i.e. no motivation for movement), hence there can be no smuggling of the *tough* subject.

In Chapter 6, I will consider language acquisition by examining the setting of the parameter for two types of null operators discussed in the previous chapters. Specifically, I will focus on the availability of complex Op based on the NP/DP distinction, where we saw that constructions like degree clausal comparatives (DCC) and *tough* constructions must involve a complex Op with the DP layer. If children acquiring a DP-language need to set a parameter before they start using the complex Op with DP layer, then the constructions involving complex Op should be delayed based on the Subset Principle (Manzini and Wexler 1987). Based on this prediction, I will investigate if the acquisition of DCC is in fact delayed in the acquisition of English, compared to that of Quantity Clausal Comparatives (QCC) through a Truth Value Judgement Task (TVJT) experiment on English-learning children. Also, I will suggest that the acquisition of smuggling constructions, e.g. English *tough* constructions, is also delayed and coincides with the timing of the acquisition of DCC.

³ Note that I will show that the Japanese construction in (2b), which superficially resembles the English *tough* construction in (2a), should be analyzed differently from (2a).

Chapter 2

Operator Movement in Comparatives

In this chapter, I will discuss the nature of null operator (Op) movement involved in clausal comparatives, which are often referred to as Comparative Deletion (CD) and Comparative Sub-Deletion (CSD) constructions in the literature. After reviewing previous literature, I will discuss both (a) what happens after Op undergoes the movement based on the labeling algorithm from Chomsky (2013) and (b) how the Op movement from its base-position is triggered by a feature-checking mechanism based on Chomsky (2000). Regarding (a), it is standardly assumed that the target of movement projects. There are, however, cases where it has been argued that a moved *wh*-phrase projects after it undergoes movement. In the chapter, I will argue that just like an overt *wh*-phrase can project after movement, so can Op. Also, I will point out that the Op projection has a certain distributional restriction, namely, it has to be in the complement position of a preposition. Regarding (b), I will argue that Op lacks ϕ -features but has an uninterpretable Case feature [uK], which is checked by inherent Case assignment from a preposition like *than* through a head-complement relation, which in turn explains the restricted distribution of the Op projection.

2.1. *Than* Comparatives in English: Previous Studies

2.1.1. The Comparative Deletion and Comparative Subdeletion

English has two types of comparative constructions in terms of the selectional property of *than*, i.e. phrasal comparatives, where *than* takes a DP as its complement, as in (1), and clausal comparatives, where it is CP complement that is selected by *than*, as in (2).

- (1) a. That umbrella is longer than [_{DP} this one]
 b. She bought more umbrellas than [_{DP} him]
- (2) a. He bought a longer umbrella than [_{CP} she did]
 b. He bought more umbrellas than [_{CP} she did]

Bresnan (1975) referred to the latter type as the Comparative Deletion (CD) construction, where the constituent indicated by “___” is analyzed as being deleted as in the following examples.

- (3) He uttered more homilies than I’d ever listened to ___ in one sitting.
- (4) Try to be as dispassionate in writing your stories as you’ve become ___ in conducting your affairs.
- (5) But they didn’t word their proposal as skillfully as we worded ours ___.

(Bresnan 1975, p. 26)

Clearly, there are some lacking constituents here, as the comparative clause of the sentences cannot be an independent clause on its own, as shown below.

- (6) a. *I had listened to ___ in one sitting.
 b. *You’ve become ___ in conducting your affairs.
 c. *We worded ours ___.

The following sentences slightly differ from the CD sentences in that only a subpart of the compared clause is deleted. They have been referred to as Comparative Subdeletion (CSD) in the literature.

- (7) a. They have many more enemies than we have ____ friends.
b. Taroo bought more magazines than Hanako bought ____ books.
c. Ann is less happy now than she was ____ sad before.
d. This table is longer than that door is ____ wide.

Here it seems that only the pre-nominal/adjectival elements, which can be represented by “x-many” (for (a) and (c) sentences) or “x-much” (for (b) and (d) sentences), are deleted in the comparative clause.

2.1.2. Operator Movement Analysis

Chomsky (1977) claims that clausal comparatives like CDs and CSDs involve *wh*-movement. He argues that a dialectal variant of CD like (8) indicates the presence of *wh*-movement in CDs.

- (8) John is more intelligent than *what* Bill is.

Furthermore, as first observed by Bresnan (1975), CDs (as in 9) and CSDs (as in 10) exhibit island effects.

(9) a. *John is more intelligent than Mary believes the claim that Bill is ____.

(Complex NP Constraint)

b. *John is more intelligent than that Bill is ____ is likely.

(Sentential Subject Constraint)

c. *John is more intelligent than Mary wonders whether Bill is ____.

(*Wh*-island constraint)

(10) a. *We ended up buying more oranges than we had discussed a plan to buy ____

apples.

(Complex NP Constraint)

b. *You have more friends that he has ____ enemies is likely.

(Sentential Subject Constraint)

c. *We bought more apples than we wondered whether to buy ____ oranges.

(*Wh*-island constraint)

(Izvorski 1995, 206)

Based on evidence like the above, Chomsky (1977) claims that there is movement of a covert operator (Op) in the compared clause, as shown below.

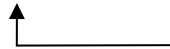
(11) John is more intelligent than Op_i Bill is t_i.



Assuming an analysis along these lines, there should be movement of ‘x-much’ in the CSD construction⁴.

(12) a. The desk is as high as [it is [_{AP} [x-much] wide]]

b. The desk is as high as [*wh* it is [_{AP} [*e*] wide]]



2.1.3. A Problem with the Movement Analysis on CSD

However, Izvorski (1995) points out a problem regarding the above analysis of CSD, i.e. the Left Branch Condition would then not apply to the CSD under this analysis. The LBC is one of the constraints Ross (1967) proposed, which we can paraphrase as below.

(13) *Left Branch Condition/LBC*

In languages like English, the leftmost constituent of a nominal, adjectival, or adverbial expression cannot be extracted out of the expression containing it.

For example, this condition captures the fact that extraction of pre-nominal/adjectival modifiers like the following is not possible in English.

(14) a. *How many do we have ____ books?

b. *How (much) was she ____ sad before?⁵

⁴ I assume that phrasal comparatives like (1) do not involve Op-movement.

⁵ The impossibility of extraction here is clear with *how* alone, but not with *how much* (p.c. Jonathan Bobaljik), as the following examples show.

(i) a. As a child, how much were you afraid of X?

(15) a. *Many we have ____ books.

b. *Very she was ____ sad before.

(Izvorski 1995, 207)

If in the same way the pre-nominal/adjectival element is moved out of its original leftmost position of an NP/AP, as shown below, an issue arises since the CSD then should not exhibit sensitivity to the LBC⁶.

(16) a. She has more boyfriends than [*wh*] she has [_{NP} [*e*] books].

b. The desk is higher than [*wh*] it is [_{AP} [*e*] wide]

Izvorski (1995, 2000) proposes that a degree/amount phrase (null counterparts of the expressions like *in what quantity/to what extent*) moves out of a sentence-final adjunct position as shown below⁷.

(17) a. ...than [_{ϕ} in what quantity]_i we have books *t_i*

b. ...than [_{ϕ} to what extent/degree]_i it is wide *t_i*.

b. How much were you happy with your performance?

⁶ What complicates this argument is that the current research indicates that there isn't a single LBC condition; a variety of factors are responsible for this effect (see e.g. Bošković 2013). I will, however, have to put a more fine-grained analysis of the LBC aside here.

⁷ Izvorski (2000) does not show explicitly the syntactic position of the amount/degree phrase here, which I will discuss later.

This movement of the null adverbial also captures the CSD's sensitivity to islands and at the same time, since there is no extraction of a leftmost element, does not face the issue of the lack of sensitivity to the LBC.

Izvorski (2000) provides some support for her analysis. For instance, when the adverbial is expressed overtly, pre-head degree/amount modifiers are prohibited (an observation made in Grimshaw 1987):

(18) a. We read (*five) magazines in a certain quantity.

b. She is (*very) sad to a great extent. (Izvorski 2000, 111)

This shows that the degree variable can be bound by only one quantificational element, and an expression like *in what quantity* or *to what extent* can be used as a degree expression in place of pre-nominal/adjectival degree expression like *x-many* or *x-much*. In addition, when an AP is used as a modifier to an NP in the subcomparative clause (the environment where the sentence-final degree expression is not available), extraction of the Degree Phrase results in a violation of the LB condition, since the extraction would be from the left branch position as shown in (19c):

(19) a. Bill is more successful than he is talented.

b. *Bill is a more successful actor than he is a talented director (Izvorski 2000, 111)

c. *Bill is a more successful actor than [Op_i he is [a [talented t_i] [director]]]

Furthermore, Izvorski (2000) claims that the movement involved in the comparative clause in CDs is also movement of the degree expression alone and not a larger phrasal movement. First

of all, she points out that the ungrammaticality of (20) can be attributed to a condition C violation if an LF such as (21b) is adopted for this sentence, rather than (21a):

(20) *Mary is prouder of John_i than he_i is.

(21) a. Mary is prouder of John than [wh proud of John_i [he is t_i]

b. Mary is prouder of John than [wh_i [**he** is proud of **John** t_i]

(modified examples taken from Lechner 1999)

Secondly, for interrogative sentences like (22a), both the Referential reading,⁸ with underlying phrasal movement, and the Non-Referential reading, with underlying movement of the degree expression, is available, while only the Referential reading is available if we use a negative sentence as in (22b), where it is assumed that the phrase *how many* cannot be extracted from the negative island in LF (see Kroch 1989, Dobrovie-Sorin 1992, Heycock 1994, Rullmann 1995).

(22) a. How many books did they decide to publish?

Referential: [How many books]_i did they decide to publish t_i

Non-Referential: [How many]_i did they decide to publish t_i books

b. How many books did they decide not to publish?

Referential: [How many books]_i did they decide not to publish t_i

⁸ On the referential interpretation, the question may be answered with a specific set of books e.g. *Ana Karenina*, *The Idiot*, *The Adventures of Sherlock Holmes*; while on the non-referential interpretation, it can be appropriately answered with a number, e.g. *three*.

Interestingly, the negative counterpart of clausal comparatives is ungrammatical, suggesting that the phrasal movement associated with the Referential reading is irrelevant, i.e. what is involved in the English comparative here is a movement of degree *wh-many* alone and not the whole NP *wh-many books*, hence we get an ungrammatical example when such a phrasal movement is forced with negation⁹.

(23) *Mary published more books than John did not¹⁰. (Izvorski 2000, 120)

Referential: Mary published more books than [wh-many books]_i John did not publish *t_i*

Thirdly, extraction out of the predicate of *there is* construction (a position involving a definiteness restriction) is possible in CD/CSD. As argued in Carlson (1977) and Heim (1987), only degree relativization can happen out of *there is* construction:

(24) a. *the books which there were *t_i* on the desk

b. the books that/∅ there were *t_i* on the desk (Izvorski 2000, 121)

⁹ The sentence in (23) is ungrammatical out of context since there is an infinite number of books John didn't publish; however, the sentence will be acceptable given an appropriate context (p.c. Jonathan Bobaljik), e.g. there is some specific set of submissions John received, some number *n* of which he didn't publish, and Mary published more than that number *n*.

¹⁰ Japanese counterparts of the sentences in (22)-(23), shown below, can be explained in the same way.

(22') a. Karera-wa nan-satu -no hon -o syuppan-suru to kimeta no referential / non-referential

They -Top what-CL -Gen book -Acc publish-do C decide-Pst Q

b. Karera-wa nan-satu -no hon -o syuppan-sinai to kimeta -no

They -Top what-CL -Gen book -Acc publish-donot C decide-Pst Q referential / *non-referential

(23') *Mary -wa John -ga sou sinakatta yori ooku -no hon -o syuppan sita

Mary-Top John-Nom so did-not than many -Gen book -Acc publish did

Other tests shown here for English comparatives cannot be used in Japanese for independent reasons.

In order to explain this contrast, it is argued that *which* can only abstract over individuals while *that* or the null relativizer can abstract over degrees. Abstraction by *which* is vacuous as in (25a) as the relevant variable is already bound by an existential quantifier, leading to ungrammaticality. On the other hand, *that* and the \emptyset relativizer abstract over the degree variable in *d many books*, leaving the individual variable available for the existential quantifier to bind, as in (25b).

- (25) a. $*\lambda x \exists x[\text{books}(x) \text{ and on-the-table}(x)]$
 b. $\lambda d \exists x[\text{books}(x) \text{ and } |x|=d \text{ and on-the-table}(x)]$

Now, comparative deletion in the definiteness restriction site is possible, and so is subdeletion, as shown below.

- (26) a. more books than there were on the table
 b. more books than there were magazines on the table

Therefore, there shouldn't be an individual variable at the position open to the definiteness restriction and the LF for (26) should be (27b) rather than (27a).

- (27) a. more books than [wh-many books]_i there were t_i on the table
 b. more books than [wh-many]_i there were t_i books on the table

Lastly, a relevant piece of evidence comes from languages with overt wh-phrases like Dutch (den Besten 1978) for CD and CSD sharing the same underlying structure, where only the degree

expression/operator moves out, not a phrase as a whole. Dutch quantitative *er* (lit. *there*) is obligatory as a clitic, doubling weak countable DPs with overt determiners and non-overt NP/N⁰s.

(28) a. Hij heft er drie.

He has there three

‘He has three (ones)’

b. *Hij heft er drie huizen

he has there three houses

‘He has three houses’

This quantitative *er* can appear in comparatives which compare countable DPs as in (29), presumably being associated with an elided NP. Crucially, *er* cannot be associated with an individual wh-trace as in (30).

(29) Hij had meer mensen uitgenodigd dan hij (er) vorig jaar had uitgenodigd.

He had more people invited than he there last year had invited

‘He invited more people than he invited last year.’

(30) Ik ken geen van de boeken die Jan (*er) heft.

I know none of the books which Jan there has

‘I know none of the books which John has.’

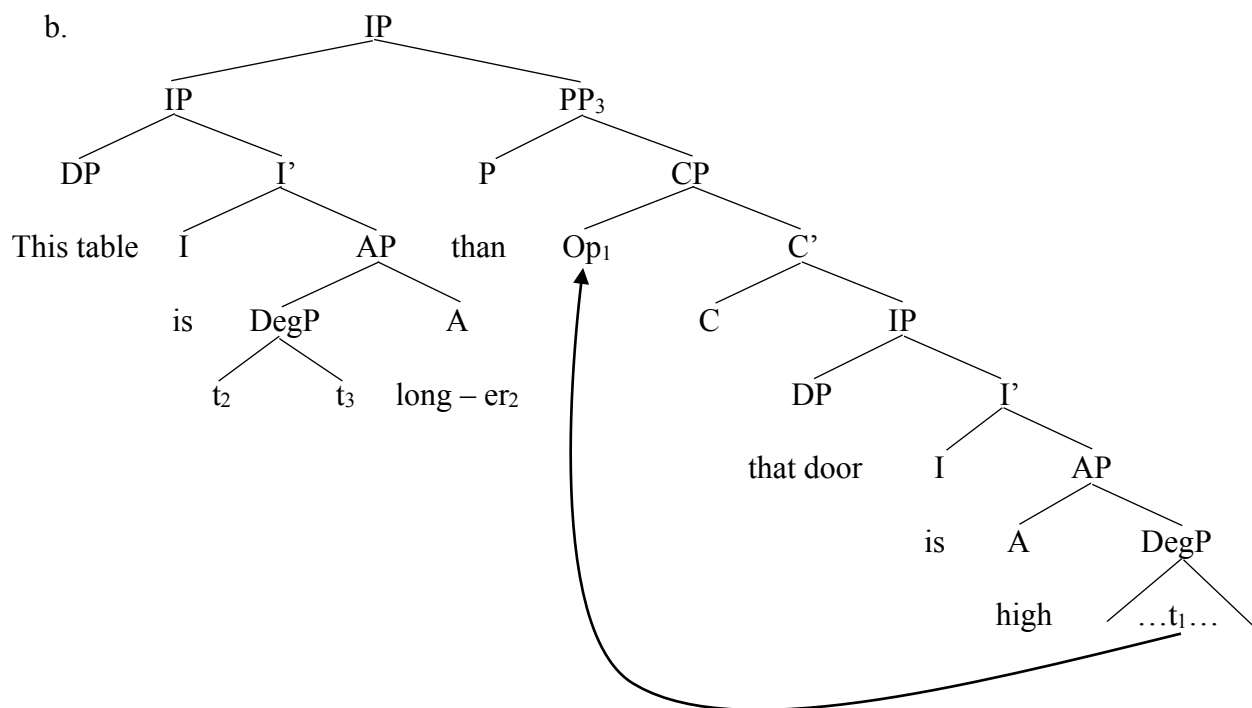
This strongly indicates that CDs are derived by the same wh-movement of a degree operator as in (31a) seen in the subcomparatives, and not as in (31b).

(31) a. ...than [in wh quantity]_i he *er* invited [[ø people] t_i] last year.

b. ...than [wh-many people]_i he *er* invited [t_i] last year.

In conclusion, I will assume, following Izvorski (1995), that both CD and CSD involve movement of a non-left branch degree element, which is not in a spec position. To be more specific, I follow von Stechow (1984), Heim (2000, 2001), Beck et al. (2009), where the null Op in English clausal comparatives is analyzed as a degree phrase (DegP), and assume the derivation of an English degree CSD sentence (32a), for example, as shown below in (32b).

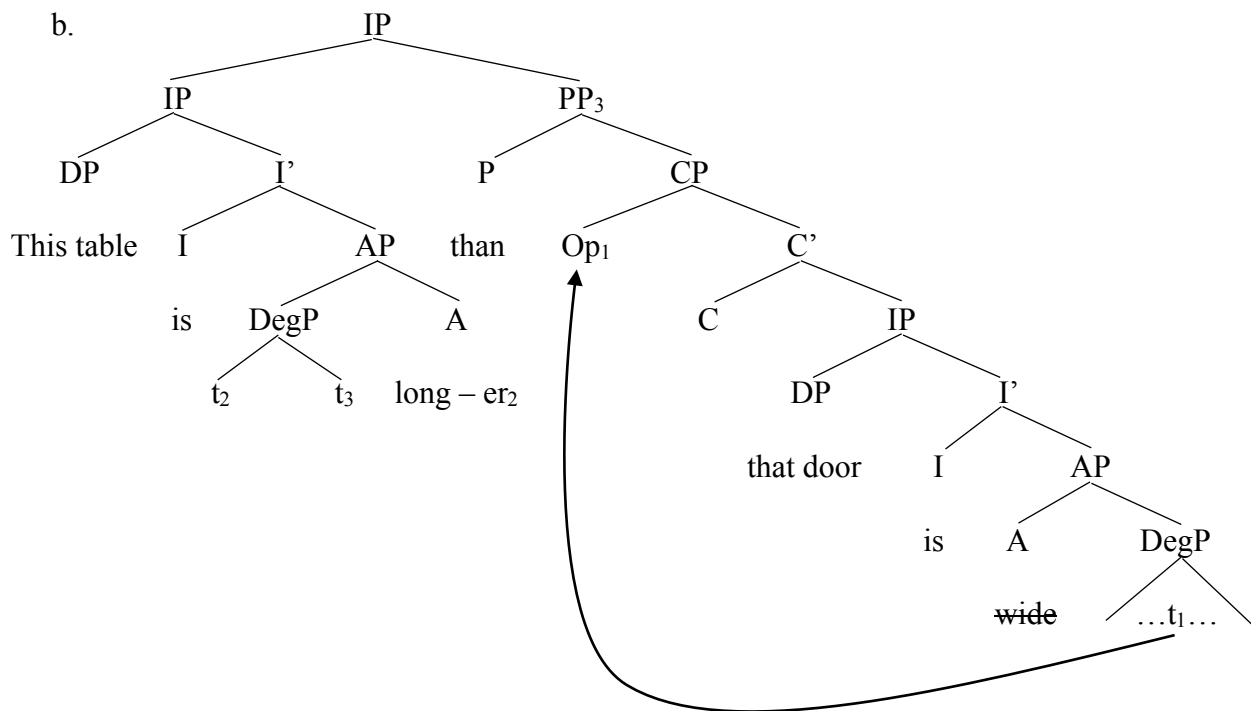
(32) a. This table is wider than that door is high. CSD



The CD counterpart thus shares the same underlying structure, which differs only in that the part of the predicate is phonologically deleted under identity (i.e. the adjective *wide* in the subordinate clause in (32' b)).

(32') a. This table is wider than that door is.

CD



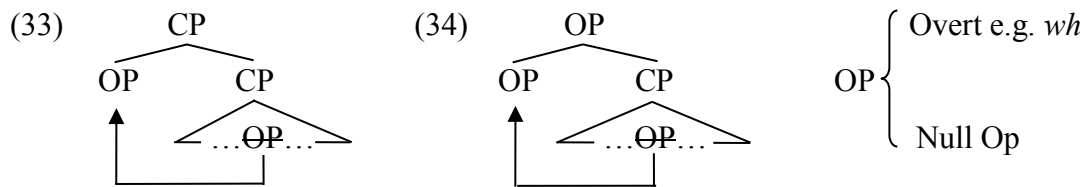
I thus follow the claim of Izvorski (1995, 2000), assuming that the Op moves from a sister position of A (which means not from a Spec/left-branch) when degree of an adjective is compared.

In the next section, I will examine some general issues that arise regarding null operator constructions, and then return to comparatives.

2.2. Operator Movement and Projection

2.2.1. Labeling and Op

Two possibilities have been argued to exist when an operator like element (OP) undergoes movement. OP can either not project as in (33), where OP is the spec of CP, or merge with CP and project itself as a label as in (34).



The case from (33) is found in *wh*-questions as shown below, where it is standardly assumed that a *wh*-phrase moves to the spec of CP, but does not project¹¹.

(35) [_{CP} *what*_i [_{C'} did John say *t*_i]]?

The second case in (34) is instantiated by English free relatives (Donati 2006, Donati and Cecchetto 2011, Cecchetto and Donati 2010, 2015); the overt operator (= *wh*) in (36) moves to merge with CP; it is assumed to project since the DP interpretation is obtained (see the works cited above).

(36) You should return [_{DP} *what*_i [_{CP} you have finished reading *t*_i]] to the library.

¹¹ More precisely, shared Q feature between OP and CP projects here under Chomsky (2013), but the issue I focus on here is simply whether the operator projects or not.

The null operator counterpart of (33), e.g. can be found in the English *tough* construction, where it is assumed that the null operator (Op) is moved to the CP-spec (though there are alternative views, e.g. Rosenbaum 1967, Postal 1971, Postal and Ross 1971, Rosenbaum 1967, Brody 1993, Messick 2013, among others).

(37) John is easy [_{CP} Op_i [_{C'} C [_{IP} PRO to please *t_i*]]]

I will examine the possibility that there are also cases where the null Op projects after movement, as in (34), and argue that there is a general restriction on such cases.

2.2.2. The Op Projection is Necessary

Sudo (2009, 2015) points out a parallelism between comparative clauses and relative clauses in Japanese, e.g. the possibility of adnominal inflection *-na*, which is used before a nominal in ordinary relatives, in a *yori*-clause suggests that there is a null nominal following *-na*.

(38) a. sore-wa [[keesoku kanoo - {*da/ na}] ryuusi] -da

that-Top measurement possibility{*COP.FIN/COP.ADNM} particle-cop

‘That is a measurable particle’

b. kono ryuusi-wa [kono kikai-de keesoku kanoo- {*da/?na}]

this particle-TOP [this machine-INST measurement possible{*COP.FIN/COP.ADNM}]

-yori tiisai.

-than small

‘This particle is smaller than this machine can measure.’

Furthermore, *ga/no*-conversion, which is one of the characteristics (thus a diagnostic) of relative clauses in Japanese, is also possible in *yor*i-clause as (40).

(39) a. John-{*no/ga} kasikoi.

John-{*GEN/NOM} smart

‘John is smart.’

b. Bill-wa [John-{*no/ga} kasikoi to] omotteiru.

Bill-TOP [John-{*GEN/NOM} smart C] think

‘Bill thinks that John is smart.’

c. Bill-wa [kinoo John-{no/ga} itta] mise-ni itta.

Bill-TOP [yesterday John-{GEN/NOM} went] shop-to went

‘Bill went to the shop that John went to yesterday.’

(40) Hanako-wa [anata-{?no/ga} omotta] -yori nagai hon-o kaita.

Hanako-TOP [you-{GEN/NOM} thought] -than long book-ACC wrote.

‘Hanako wrote a longer book than you thought.’

Based on these data in addition to the argument that Op movement is involved in Japanese clausal comparatives (e.g. Ishii 1991, Kikuchi 1987), in Hattori (2018), I argue that the comparative "clause" in Japanese is actually an NP with an operator being co-indexed with a null N head which is modified by a relative clause as in (41).

- (41) John-wa [_{NP} [_{CP} Mary-ga t_i katta Op_i] [_N \emptyset]] yori takusan-no hon-o katta
 John-Top Mary-Nom bought than many-Gen book-Acc bought
 'John bought more books than Mary did'

However, a problem which then arises is that we must say that this bare clause in the Japanese clausal comparative is an NP, which means that we have to explain why this same bare clause (analyzed as an NP) cannot be selected in other environments where an NP can be selected, e.g. in a subject position (42b) or in an object position (43b) (the issue will be discussed in more detail below). Here, the positions where an NP like *hon* 'book' or (*takusan-no*) *ryou* '(many) quantity' normally appears in (42a) or (43a) cannot be filled by the bare clause *Hanako-ga katta* 'Hanako bought,' which is now analyzed as the same NP category.

- (42) a. [hon/ryou] -ga totemo ooi
 book/quantity -Nom very many
 'There are so many books/the quantity is huge'
- b. *[Mary-ga (hon-o) katta] -ga totemo ooi.
 Mary-Nom book-Acc bought -Nom very many
 '(intended) The quantity of the books Mary bought is huge'

- (43) a. Taroo-wa [hon/takusan-no ryou] -o yonda
 Taroo-Top book many-gen quantity -Acc read
 'Taroo read many books/Taroo read a lot'

b. *Taroo-wa [Mary -ga (hon-o) yonda] -o yonda

Taroo-Top Mary-Nom book-Acc read-Pst -Acc read-Pst

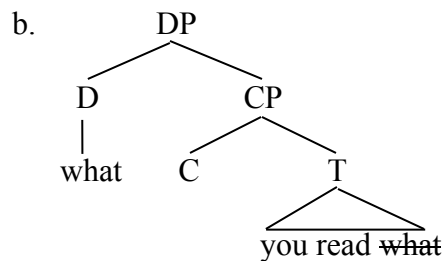
'(intended) Taro read the amount of books Mary read'

In order to solve this problem, we need a new analysis, capturing the NP character of the Japanese comparative clause in a different way which would distinguish it from ordinary NPs.

2.2.3. Op Analysis of the Japanese Comparative Clause

As mentioned above, Cecchetto and Donati (2010, 2015) argue that there are some cases in which overt operators can project as a label after they move to internally merge with a CP, where the moved lexical item can transmit its label both when it is externally merged and internally merged (after movement). For example, this happens in the free relative construction.

(44) a. I read what you read t_{what} . (Cecchetto and Donati 2015: 1)



Here, wh-word, a D, moves and provides a label when it internally merges with CP, so that the resulting structure *what you read* becomes a DP.

Following Cecchetto and Donati, I claim that Op can project when it is merged with a CP after it moves. E.g. in Japanese clausal comparatives, where Op is bare, I assume the following

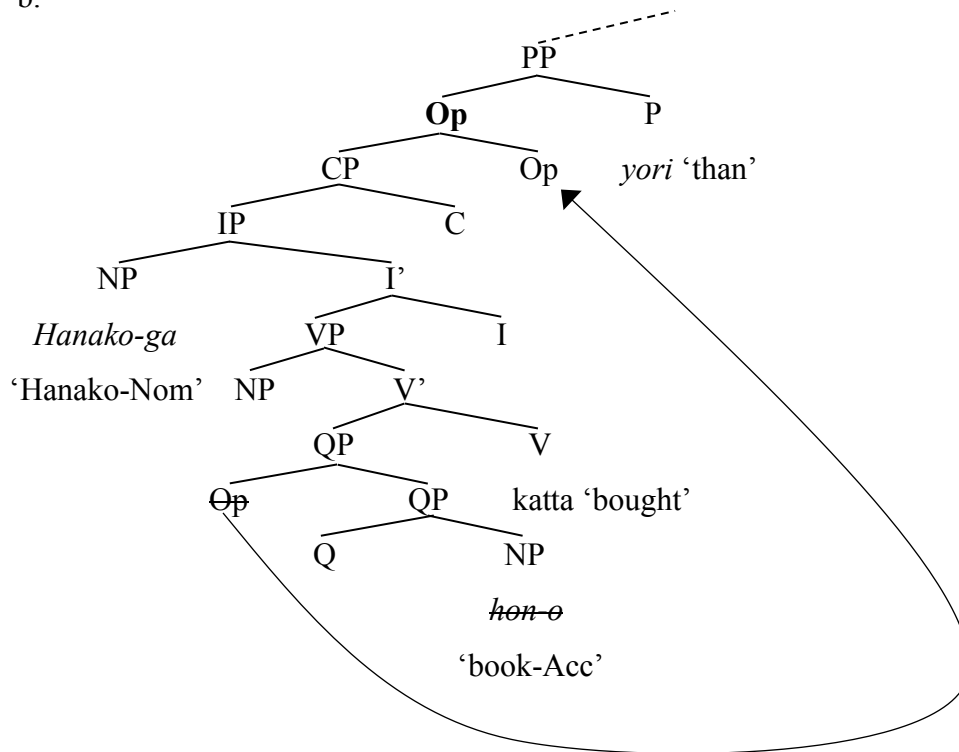
structure (45b) for the embedded clause of (45a), where the Op is base-generated in the spec position of a QP with a null head, and projects (when it is internally merged) after movement.

(45) a. Taroo-wa [hanako-ga t_i katta Op_i] yori takusan-no hon-o katta.

Taroo-Top Hanako-Nom bought than many-Gen book-Acc bought

'Taroo bought more books than Hanako did.'

b.



In (45b), the bare clause of comparatives like *Hanako-ga katta* 'Hanako-Nom bought' is a projected Op. We have a case here where a null Op projects, which has a very restricted distribution; it is possible as the complement of a P like *than*, but not in the subject position or object position. Thus, this projected Op cannot appear in the subject position, as in (46c), or an argument position of a verb like *yonda* 'read' as in (46d), where an overt NP (*takusan-no* *ryou* 'huge quantity' is allowed,

as shown in (46a, b). In light of this, I propose a generalization regarding the distribution of the projected Op, i.e. it cannot appear as a subject or a complement of a verb, as shown in (47).

(46) a. [ryou] -ga totemo ooi

quantity -Nom very many

'The quantity is huge'

b. Taroo-wa [takusan-no ryou] -o yonda

Taroo-Top book many-gen quantity -Acc read

'Taroo read many books/Taroo read a lot'

c. *[Op Mary-ga hon-o t_i katta Op_i] -ga totemo ooi.

Mary-Nom book-Acc bought -Nom very many

'(intended) The quantity of the books Mary bought is huge'

d. *Taroo-wa [Op Mary -ga hon-o t_i yonda Op_i] -o yonda

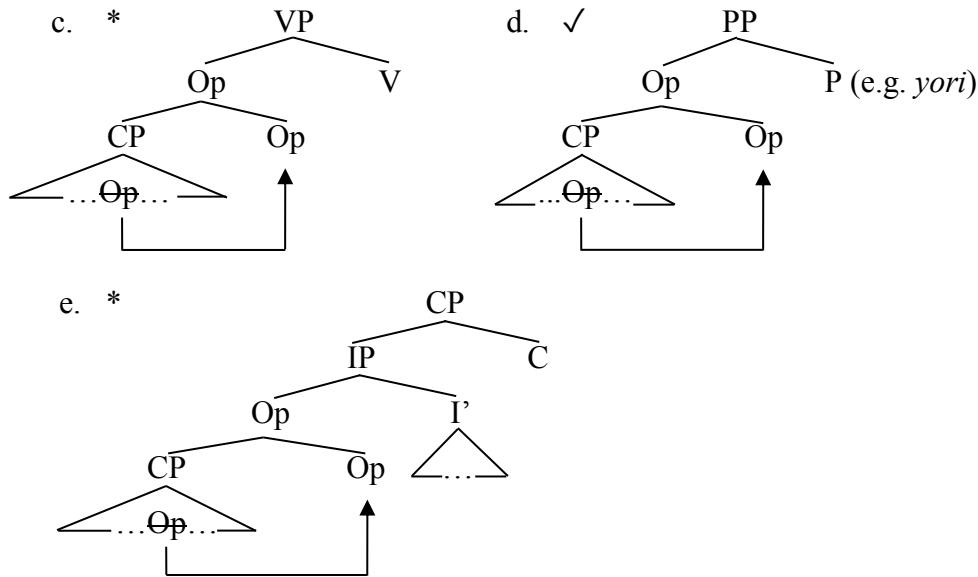
Taroo-Top Mary-Nom book-Acc read-Pst -Acc read-Pst

'(intended) Taro read the amount of books Mary read'

(47) The Op Generalization

a. null Op projection can be the complement of certain Ps like *yori* 'than' in comparatives, but not the complement of a verb.

b. null Op projection cannot be a subject



This generalization will be confirmed by another construction which involves Op movement in the next section.

2.2.4. Evidence from Temporal Clauses

Larson (1990) observes the following paradigm regarding temporal prepositions. First, clausal PPs¹² headed by temporal prepositions like *before*, *after*, *since* and *until* show ambiguity in their interpretation (Geis 1970).

- (48) a. I saw Mary in New York [PP before [CP₁ she claimed [CP₂ that she would arrive]]]
 b. I encountered Alice [PP after [CP₁ she swore [CP₂ that she had left]]]
 c. I can't leave [PP until [CP₁ John said [CP₂ I could leave]]]
 d. I haven't been there [PP since [CP₁ I told you [CP₂ I was there]]]

¹² I will refer to Ps that appear to take clausal complements as "clausal PPs".

For instance, the temporal clause in (48a) can be interpreted as “Before she made a certain claim” or “prior to the time *t* that she alleged would be the time of her arrival.” Larson claims that the lower construal (the latter construal) arises via null Op movement as in (49b), since the ambiguity disappears with a subjacency violation (Complex NP Constraint), as in (49a). I assume (following Larson) that Ps can pick up the temporal reference of the highest CP in its complement. Then, the local construal (the first reading noted above) is obtained without Op-movement.

(49) a. I saw Mary in New York [_{PP} before [she made [_{NP} the claim [that she had arrived]]]

✓ “Before she made a certain claim”

* “prior to the time *t* that she alleged would be the time of her arrival.”

b. I saw Mary in New York [_{PP} before [_{CP1} Op_i she claimed [_{CP2} *t_i* that she would arrive *t_i*]]]

On the other hand, other English clausal Ps, e.g. *although*, *because*, *in case*, *unless*, and *while*, are not ambiguous in this manner.

(50) a. I still respect John [_{PP} although [he claims [that he killed his mother]]]

b. I visited New York [_{PP} because [Mary dreamed [that Max was there]]]

c. I won’t visit New York [_{PP} unless [Bill promises [Mary will be there]]]

d. I won’t visit New York [_{PP} in case [Bill says [Mary is there]]]

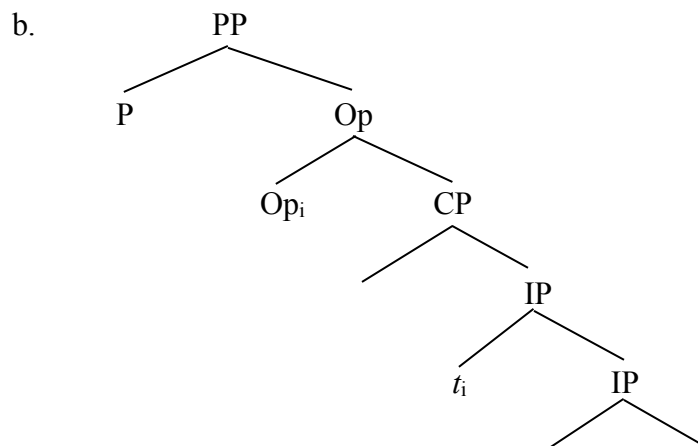
e. I didn’t see Mary in New York [_{PP} while [_{CP1} she said [_{CP2} she was there]]]

E.g. the expected two readings in (50a) would be paraphrased as “Despite John’s claiming that he killed his mother” and “Despite what John claims, viz., that he killed his mother”, but only the former reading is possible where the concession can only be understood as being made for John’s claim. Therefore, I assume (following Larson 1990) that there is no Op movement available in the complements of these prepositions (*although, because, in case, unless, while*). Larson claims that the crucial difference between the two groups is that the prepositions of the former group can take both DP and clausal complements.

- (51) a. $\left\{ \begin{array}{l} \text{before} \\ \text{after} \\ \text{since} \\ \text{until} \end{array} \right\} \left\{ \begin{array}{l} \text{John arrived} \\ \text{that day} \end{array} \right.$
- b. $\text{while} \left\{ \begin{array}{l} \text{John slept} \\ \text{*that day} \end{array} \right.$
- c. $\left\{ \begin{array}{l} \text{although} \\ \text{because} \\ \text{unless} \\ \text{in case} \end{array} \right\} \left\{ \begin{array}{l} \text{Mary walked out on Max} \\ \text{*that fact/reason/eventuality} \end{array} \right.$

The following explanation can be given for Larson's paradigm, based on the assumption that Op can project when it is internally merged with a CP. The Op is base-generated as an IP adjunct¹³. In principle, after Op moves, either Op or CP can project. However, the former option is possible only with the Ps that can take DP complements¹⁴, hence only the Ps from (51a). It is not an option for the Ps from (51b-c). The structure from (48') is then possible only for Ps from (51a).

(48') a. I saw Mary in New York [_{PP} before [_{Op} Op_i she claimed [_{t_i} that she would arrive t_i]]]



¹³ I will discuss the reason why the Op does not project in the base-generated position later in the chapter.

¹⁴ If projection of the Op is like a DP, it may be expected that extraction from a temporal adjunct shouldn't be possible as it might involve a complex NP constraint (CNPC) violation. However, at least for some speakers the relevant sentence is grammatical (p.c. Jonathan Bobaljik):

(i) What_j did you find that Mary cited before [_{Op} Op_i [she claimed that she read t_j t_i]]?

Regarding the status of Op, I will argue in Chapter 4 that Op is a null N head rather than a D head. Thus, the Op projection is not exactly a DP (or an overt NP), which might be the reason why we do not get the CNPC violation for the extraction out of the Op projection (note also that the *before* clause itself should be an island).

- (52) a. $\left\{ \begin{array}{c} \text{before} \\ \text{after} \\ \text{since} \\ \text{until} \end{array} \right\} \left\{ \begin{array}{c} \text{Op} \\ \text{DP} \\ \text{CP} \end{array} \right.$
- b. $\left\{ \begin{array}{c} \text{while} \\ \text{although} \\ \text{because} \\ \text{unless} \\ \text{in case} \end{array} \right\} \left\{ \begin{array}{c} * \text{Op} \\ * \text{DP} \\ \text{CP} \end{array} \right.$

In other words, the first set of Ps from (51a) can take an Op projection as their complement, while the Ps from (51b-c) cannot. Therefore, the movement from the deeply embedded clause is possible only when the prepositions can take the Op projection as their complements. This leads to the conclusion that long-distance movement of the null operator, hence the long-distance construal, is possible only if Op projects after movement, hence with the Ps from (52a), but not if there is no Op movement, hence not with the Ps from (52b). In fact, a comparative clause, which is analyzed as an Op projection, allows extraction of Op from the deeply embedded finite clause in both English and Japanese:

- (53) a. Mary read more books **than** Op_i everyone thinks Tom believes t_i that it is said t_i
that John read t_i.

- b. [[[[John-ga *t* yonda to] iwarete iru *t* to] Tom-ga uwasa-site iru *t* to]
 John-Nom read Comp is-said Asp Comp Tom-Nom rumor-do Asp Comp
 minna-ga omotte iru Op yorimo] Mary-wa takusan hon-o yonde ita
 everyone-Nom think Asp than Mary-Top many book-Acc read Past
 ‘Mary read more books than everyone thinks Tom made rumor that it is said that
 John read’ (Kikuchi 1987, p. 7)

Turning now to Japanese, Japanese also has temporal clauses as complements of temporal prepositions, e.g. *–made* ‘until’, *–mae-ni* ‘before’, *–ato-ni* ‘after’.

- (54) a. Taro-wa [Hanako-ga kaetta] *ato-ni* kaetta.
 Taro-Top Hanako-Nom went-home after went-home
 ‘Taro went home after [Hanako went home] (= the time when Hanako went home)’
 b. Taro-wa [ame-ga yamu] *made* matteita.
 Taro-Top rain-Nom stop until waited
 ‘Taro waited until [the rain stops](= the time when rain stopped)’

Miyamoto (1993) argues that there is null operator movement in the temporal clauses followed by *mae/ato* ‘before/after’, following Larson’s (1987, 1990) analysis of *before*, *after*, *since* and *until*. A piece of evidence for this comes from contrasts like (55).

- (55) a. John-ga [_{ADV} [Mary –ga [Bill₁ –ga kurudaroo-to] yosoositeita] mae-ni] kare₁-o
 -Nom -Nom -Nom come-will-that predicted before him-Acc

New York-de mikaketa.

-in saw

‘John saw Bill₁ in NY [before Mary predicted that he₁ would come]’

✓John saw Bill before Mary predicted the time of his arrival

✓John saw Bill before the time of his scheduled arrival predicted by Mary

b. John-ga [ADV [Mary-ga [NP [Bill₁-ga kurudaroo-toyuu] uwasa]-o kiiteita] -mae-ni]

-Nom -Nom -Nom come-will-that rumor -Acc heard before

kare₁-o New York-de mikaketa

him-Acc in saw

‘John saw Bill₁ in NY [before Mary heard the rumour that he₁ would come]’

✓John saw Bill before Mary’ hearing of the rumour about his arrival

* John saw Bill before the time of his arrival rumour of which is heard by Mary

Crucially, (55a), but not (55b), allows the interpretation that John saw Bill before his scheduled arrival time, predicted by Mary, suggesting that there is an island effect here (the complex NP constraint) and therefore a null Op movement is involved, as shown below.

(55') a. [PP [CP Mary -ga [CP [IP Bill -ga t_i kurudaroo] -to t_i] yosoositeita Op_i] mae-ni]

b. *[PP [CP Mary-ga [NP [CP [IP Bill-ga t_i kurudaroo]-to yuu t_i] uwasa]-o kiiteita
Op_i]-mae-ni]

Given the analysis suggested above, the ambiguity of (55a) indicates that Op here projects after movement. Furthermore, the relevant structures cannot appear in argument positions (subject or

object) of verbs without an overt head as in (56c, d) while an NP *sono toki* ‘the time’ can appear in the same environments as in (56a, b). This seems to hold both in Japanese and English (see the translations).

(56) a. [Sono toki] –ga oso-sugi-ta

that time –Nom late-too-Past

‘The time was too late’

b. Taroo-wa [sono toki]–o machigae-ta

Taroo-Top that time –Acc misunderstand-Past

‘Taroo misunderstood the time’

c. [Mary-ga Bill-ga kuru daroo –to yosoositeita *(toki)] –ga oso-sugi-ta

Mary-Nom Bill-Nom come will that predicted time –Nom late-too-Past

‘[*(The time when) Mary predicted Bill would come] was too late’

d. Taroo-wa [Mary-ga Bill-ga kuru daroo –to yosoositeita *(toki)] –o machigae-ta

Taroo-Top Mary-Nom Bill-Nom come will that predicted time –Acc misunderstand-Past

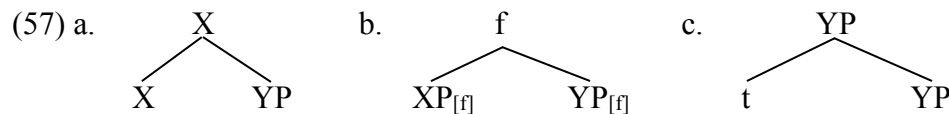
‘Taroo misunderstood [*(the time when) Mary predicted Bill would come]’

This confirms that the Op projection cannot be in the subject position or selected by a verb as its complement (The Op Generalization).

2.3. Deducing the Op Generalization and Op Movement

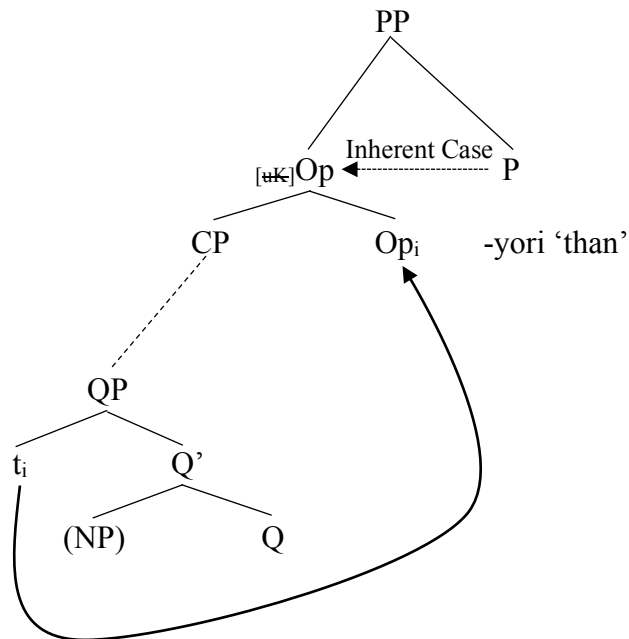
In this section, I will address the above conclusion from the perspective of Chomsky's (2013) system.

An issue in fact arises here regarding the labeling algorithm from Chomsky (2013). Chomsky states that when a head and a phrase merge, the head projects as in (57a) and when two non-minimal projections (= phrases) are merged, a shared feature of the two phrases is projected, as in (57b), or if one of the phrases is a trace it gets ignored and the other phrase is projected, as a label as in (57c).



If we assume that the Op is bare, there is no problem when it projects after merging with the CP, but the problem is that it should have projected when it was merged with the QP, a phrase, in its base position as shown below.

(58) Quantity clausal comparatives in Japanese



The problem with the Op analysis of comparatives is that the Op head should have projected when it was merged with the Q', a phrase (i.e. QP) at the point of Op-merger in its base position based on Chomsky's (2013) labeling algorithm, leading to the question why the Op keeps moving to project in the complement position of *than*. I will propose an account of this issue based on the Activation Condition (Chomsky 2000).

Chomsky (2000) claims that when there is a probe seeking a goal, triggering its movement, a goal must bear some uninterpretable feature to be visible for movement (the Activation Condition). Schematically, the feature-checking system for Chomsky (2000) functions as shown below (i = interpretable feature, u = uninterpretable feature).

(59) X (probe) Y(goal)

uF	iF
EPP	uK

Here, the goal Y is targeted by the probe X and the feature F is deleted under match (Agree). As a reflex of F feature checking relation, the uninterpretable feature K of Y is checked off. E.g. the C and *what* are involved in a wh-feature checking relation in the following sentence, where the uninterpretable Q feature of the Goal *what* makes it visible for the movement to SpecCP (and agreement with C). The Q feature is, in turn, checked off after the movement.

(60) I wonder what_i C Mary bought t_i
 $i\text{wh}$ ~~uwh~~
 ~~uQ~~ ~~EPP~~ (Bošković 2007, p. 599)

When it comes to agreement and Case, Chomsky argues that Case makes DP/NP active for agreement/movement, and is checked off as a reflex of agreement/movement, as shown below. ϕ -feature licensing is then necessary for Case to be checked by a verb, since structural Case licensing is a reflex of ϕ -feature checking (for Chomsky).

(61) $v(\text{probe})$ NP(goal)
 $\text{u}\phi$ $i\phi$
 ~~uK~~

Then, my claim is that the null Op lacks ϕ -features but has an uninterpretable Case feature to be checked off. Since Op has no ϕ -features, there will be no ϕ -feature checking relation between V and Op and thus a verb cannot assign structural Case to it.

(62) V(probe) Op(goal) cf. (61)

u ϕ
 uK

(63) P(probe) Op(goal)

~~uK~~

On the other hand, prepositions are often assumed to assign inherent Case. Furthermore, inherent Case is standardly assumed to be dissociated from agreement. I claim, then, that prepositions like *than* can assign inherent Case, which needs no ϕ -features for checking, and thus prepositions like *than* can check the Case of the Op without establishing a ϕ -feature checking relation.

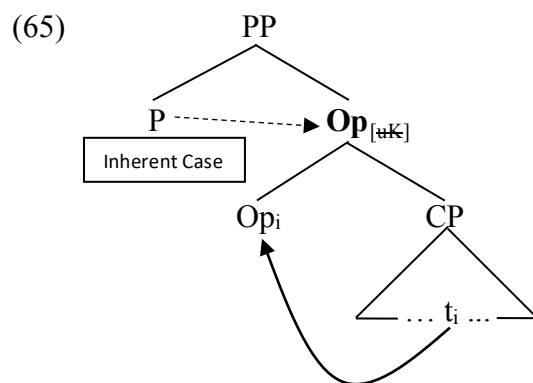
Now, inherent Case is often assumed to be assigned under both θ -role assignment and in a head-complement relation. The above discussion may indicate that the second requirement (a head-complement relation) is the only pre-requisite for inherent Case assignment (since the preposition does not appear to assign a θ -role to the element it Case-marks in the relevant cases). This is in line with Franks (1994), who argues that a head-complement relation but not necessarily θ -assignment is needed for inherent Case assignment. In particular, Franks provides a number of arguments that the genitive case assigned by numerals (more precisely, a null Q head, as discussed later) to its NP complement, as in (64), is an inherent Case in Serbo-Croatian although there is no θ -relation between the elements in question¹⁵.

(64) On kupuje [pet [kola]]

he buys five cars_{GEN}

¹⁵ See Franks (1994) for relevant tests for inherent Case. Franks shows that in several respects the genitive in question patterns with non-accusative cases assigned by verbs and differently from accusative Case assigned by verbs or the genitive Case assigned by nouns, which are structural Cases.

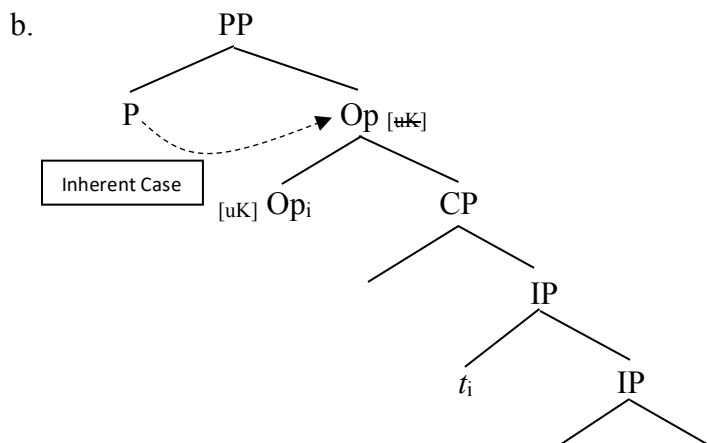
Furthermore, I assume that after Op moves, Op projects in order to establish the head-complement relation with the preposition *than*, for its [uK] to be checked, based on the Labeling Algorithm by Chomsky (2013). As the bare Op with the [uK] has to keep moving to project itself as a label (as in (57a)) in order to be in the prepositional complement position where it gets its [uK] checked by being assigned inherent Case by the comparative preposition *than* through the head-complement relation, as shown below.



Here, the [uK] triggers the movement of the Op in the spirit of Bošković (2007), where it is claimed that the need for a NP/DP to check Case can drive the movement of the NP/DP. This is precisely the reason why the Op projection can appear in the complement of some Ps (which can assign inherent case) and not of Vs, as well as the reason why the Op has to keep moving to project itself as a label in order to be in the prepositional complement position where it gets its [uK] checked by being assigned inherent Case by the comparative preposition *yori* ‘than’.

The same line of explanation can be given for the case of the Op movement in the temporal clauses. The Op, with an uninterpretable Case feature [uK], needs to project when it is merged with the CP for the [uK] to be licensed by inherent Case assignment by a prepositions like *before*.

(66) a. I saw Mary in New York [_{PP} before [_{Op} Op_i she claimed [_{t_i} that she would arrive t_i]]]



Again, this uninterpretable Case feature on the Op is the reason why it does not project in the base-generated position of the temporal clause.

2.4. Why Only Certain Ps?

I have claimed above that only certain prepositions like *than* or some temporal prepositions (*before*, *after*, *since*, *until*), which allow long-distance movement of the null operator (hence the long-distance construal), can select the Op projection as their complements. The obvious issue is, then, that although prepositions in general are assumed to assign an inherent Case, prepositions other than these prepositions apparently cannot license the projected Op in their complement.

(67) a. *I am afraid **of** [_{Op} Op_i this building is high t_i]

(intended: I am afraid of how high this building is)

b. *I am not sure **about** [_{Op} Op_i that table is high t_i]

(intended: I am not sure about the height of that table)

c. *I was surprised **at** [_{Op} Op_i the baby is tall t_i]

(intended: I was surprised at the height of the baby)

d. *I am interested **in** [_{Op} Op_i this building is high t_i]

(intended: I am interested in the height of this building)

Then, the question we need to address now is what properties are shared by *than* and temporal prepositions like *before* or *after* which make them able to take a projected Op as their complements. I suggest here that comparative/temporal clause can be an Op projection because this is allowed by a certain semantics. In particular, both cases involve abstraction over a degree variable, ordering relation between the degrees and the maximality operator applied to the degree.

Here I take Heim's (2001) version of von Stechow's (1984) seminal work on comparison to be the standard analysis of comparative clauses. Under this analysis, adjectives are assumed to be the lexical entries which relate a degree and an individual. For example, *tall* has the following denotation, where degrees (type d) form a scale (i.e. a set ordered by an ordering relation).

$$(68) \llbracket \text{tall} \rrbracket = \lambda d: d \in Dd. \lambda x: x \in De. \text{Height}(x)$$

In the clausal comparatives, the matrix and the *than*-clause provide sets of degrees through abstraction over a degree variable, and the comparative morpheme *-er* relates their maxima (type: $\langle\langle d, t \rangle, \langle\langle d, t \rangle, t \rangle\rangle$).

$$(69) \llbracket \text{-er} \rrbracket = \lambda D1. \lambda D2. \text{MAX}(D2) > \text{MAX}(D1)$$

The definition of the *max* operator is shown below.

(70) The Maximality Operator MAX:

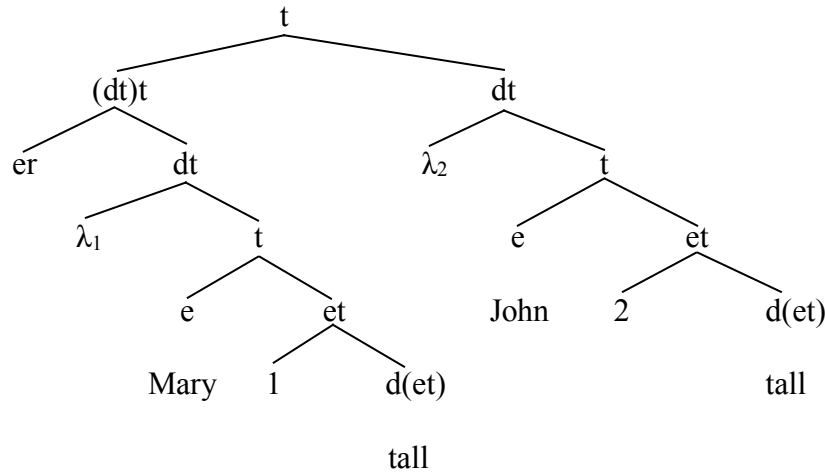
Let DEG be a set of degrees ordered by the relation \leq , then

$$\text{MAX}(\text{DEG}) = \lambda d [d \in \text{DEG} \wedge \forall d' \in \text{DEG} [d' \leq d]]$$

Based on this, the comparative morpheme is the highest operator in the Logical Form, taking the comparative clause and the main clause as its arguments. For example, the clausal comparative like (71) has the following LF and the compositional interpretation as in (72).

(71) John is taller than [_{DegP} [_{Deg} Op]_i [_{CP} Mary is tall [_{DegP} [_{Deg} t]_i]].

(72) a.



b. $[[[1 [Mary\ t1\ tall]]]] = \lambda d. \text{Height}(\text{Mary}) \geq d$

$[[[2 [your\ shoes\ t2\ long]]]] = \lambda d. \text{height}(\text{John}) \geq d$

$[[er]] = \lambda D1. \lambda D2. \text{MAX}(D2) > \text{MAX}(D1)$

$[[er]] (\lambda d. \text{Height}(\text{Mary}) \geq d)(\lambda d. \text{Height}(\text{John}) \geq d) = 1$

iff $\text{MAX}(\lambda d. \text{Height}(\text{John}) \geq d) > \text{MAX}(\lambda d. \text{Height}(\text{Mary}) \geq d)$

iff $\text{Height}(\text{John}) > \text{Height}(\text{Mary})$

Furthermore, von Stechow (2009) discusses time (type i) in the semantics of degree in his analysis of *früher/später* ‘earlier/later’, where he takes *-er* as type $\langle\langle i, t \rangle, \langle\langle i, t \rangle, t \rangle\rangle$ for a sentence like *Alla kam später als Caroline* ‘Alla came later than Caroline’, showing that the time can play a conceptual role of degree.

Now, we compare the semantics of comparative clauses with that of *before/after* clauses. Beaver and Condoravdi (2003) give a uniform analysis of *before* and *after*, with an existential, a temporal ordering, and an operator *earliest*. Based on this, *before/after* clauses provide set of times through abstraction over a time variable, which is coerced to a time by the *earliest* operator. Here, it is assumed that a set of times I is left-bounded if there is $i \in I$ such that for all $i' \in I$, $i \leq i'$. For left-bounded I , that i is called *earliest*(I).

(73) $A \text{ before } B \text{ iff } (\exists i \in A) i < \text{earliest}(B)$

$A \text{ after } B \text{ iff } (\exists i \in A) i > \text{earliest}(B)$

They claim that this *earliest* operator is involved here since, for example, *Harrison was alive after Lennon was alive* has an interpretation where it implies that Harrison outlived Lennon, and not merely that Harrison was alive at some point after Lennon was born. Krifka (2010) rewrites the Beaver and Condoravdi’s (2003) and Condoravdi’s (2010) representation to be functions from worlds into functions from times to truth values in the following way.

$$(74) [[before]] = \lambda w \lambda i \lambda i' [i' < i]$$

$$(75) [[A [before B]]] = [[[before B] A]] = \lambda w \lambda i [[[A]](w)(i) \wedge [[before B]](w)(i)]$$

Crucially, he claims (following Condoravdi 2010) that the MAX operator similar to the one used in comparatives is employed here as an alternative to the EARLIEST operator.

$$(76) [[before B]] \text{ a. } \lambda w [\lambda i \lambda i' [i' < i] (\text{EARLIEST}([B](w)))] \quad \text{type shift EARLIEST}$$

$$= \lambda w \lambda i [i < \text{EARLIEST}([B](w))]$$

$$\text{b. } \lambda w [\lambda i \lambda i' [i' < i] (\text{MAX}([B](w)))] \quad \text{type shift MAX}$$

$$= \lambda w \lambda i [i < \text{MAX}([B](w))]$$

Here the EARLIEST or MAX operators reduces the set of times I denoted by the temporal clauses to the earliest/maximal time i of the set. EARLIEST(I) is the smallest time in I not preceded by any other time in I, while MAX(I) is the largest time in I provided that all other times in I are part of it. Thus, the same result is obtained by the type shift with these coercive operators.¹⁶

$$(77) \text{EARLIEST}(I) = i [i \in I \wedge \neg \exists i' [i' \in I \wedge i' < i] \wedge \forall i'' [i'' \in I \wedge \neg \exists i''' [i''' \in I \wedge i''' < i''] \rightarrow i \subseteq i'']]$$

$$(78) \text{MAX}(I) = i [i \in I \wedge \forall i' [i' \in I \rightarrow i' \subseteq i]]$$

¹⁶ The complement clause of a temporal preposition like *while*, which we argued does not involve the Op movement, denotes some interval of time (see e.g. Bennett and Partee 2004) and thus does not seem to have this coercive type shifting.

The above claims indicate that, semantically, the clausal complements of *than* and *before/after* have something in common in that both involve the ordering relation of abstracted degrees and coercion by the MAX operator. Therefore, it seems plausible to suggest that the Op projection is in principle possible only in the environments which involve these semantic properties, in addition to the Case-licensing mechanism discussed in the previous subsection¹⁷. This is the reason why only "certain" prepositions allow the Op projection in their complements.

2.5. Conclusion

In this Chapter, I have discussed the nature of the null operator (Op) movement involved in Comparative Deletion (CD) and Comparative Sub-Deletion (CSD), where I argued that the Op is bare (non-branching). I argued that, just like overt *wh*-phrases can project after movement in free relatives (Cecchetto and Donati 2015), Op can project when it is merged with a CP after the movement in CD/CSD, based on the labeling algorithm from Chomsky (2013). I pointed out that this Op projection has a certain distribution, namely it has to be in the complement position of prepositions like *than* and some temporal prepositions like *before* or *after*. I explained this generalization by the Activation Condition (Chomsky 2000). I claimed that Op lacks ϕ -features but has an uninterpretable Case feature [uK], which is checked by inherent Case assignment from a preposition like *than* through a head-complement relation, which can be established by the projection of the Op. This is why the Op movement from the base-position is triggered in the spirit of Bošković (2007). Based on the analysis, I will discuss different types of comparatives and analyze the variation across languages in this domain in the next Chapter.

¹⁷ The restriction by semantics alone here is not adequate to account for cross-linguistic variation in comparatives, which I will discuss in Chapter 3 and 4.

Chapter 3

Cross-linguistic Variation in Comparatives

In this chapter, I will discuss cross-linguistic variation in complement selection of the comparative preposition *than*. The previous literature has shown that Japanese does not allow a clausal comparative when degrees of adjectives are compared. I will show that the previous accounts face problems when we look at other languages and different types of comparatives. In order to better understand the variation in comparatives, I conduct a cross-linguistic survey regarding the availability of 10 different types of comparatives in 15 languages. We will see that other languages also exhibit the pattern found in Japanese. I will then show that there is a common property among such languages. In particular, I will show that there is a correlation here with the parametric variation concerning the NP/DP parameter (Bošković 2008a).

3.1. Quantity-comparison vs Degree-comparison

3.1.1. Japanese Clausal Comparatives

There is a distinction within clausal comparatives (both CD and CSD), which I will discuss here with respect to Japanese. Ishii (1991), Snyder et al. (1995) and Beck et al. (2004) point out that Japanese disallows a subordinate sentence following *yorī* ‘than’ when degrees of adjectives are compared, but allows it when quantities are compared. I call the former a Degree Clausal Comparatives (DCC), and the latter Quantity Clausal Comparatives (QCC). (1-2) are the examples of CDs, where sentences in (1) are QCC as quantities of umbrellas are compared, while (2) are DCC sentences as degrees of the adjective *nagai* ‘long’ are compared. (b) sentences show the English counterparts.

(1) CD-QCC

- a. Taroo-wa [Hanako-ga katta yori (mo)] takusan (-no) kasa-o katta
Taroo-Top [Hanako-Nom bought YORI (mo)] many (-Gen) umbrella-Acc bought
- b. Taroo bought more umbrellas than Hanako did/bought.

(2) CD-DCC

- a. ?* Taroo-wa [Hanako-ga katta yori (mo)] nagai kasa-o katta
Taroo-Top [Hanako-Nom bought YORI (mo)] long umbrella-Acc bought
- b. Taroo bought a longer umbrella than Hanako did/bought.

The CD-DCC is ungrammatical in Japanese but not in English. Now, the CSD counterparts are shown in (3) and (4).

(3) CSD-QCC

- a. John-wa [_{CP} Mary-ga zassi -o katta] yori takusan hon-o katta
-Top -Nom magazine -Acc bought than many book-Acc bought
- b. John bought more books than Mary bought magazines.

(4) CSD-DCC

- a. *Kono teeburu-wa [_{CP} ano doa -ga hiroi] yori takai.
This table-Top that door -Nom wide than tall
- b. This table is taller than that door is wide.

Here we must note that the degree-compared CSDs that have been discussed in the previous literature (often referred to as “subcomparatives”) have a different structure from their CD counterparts, i.e. the adjective appears in a predicative position (this table is taller) and not in an attributive position (a longer umbrella). This predicative version of CSD-DCC has been used because the CSD-DCC with the adjective in attributive position is ungrammatical even in English (Pilch 1965, Pinkham 1982, Kennedy and Merchant 2000)¹⁸, as shown below.

- (5) a. *Pico wrote a more interesting novel than Brio wrote a ____ play.
 b. *Erik drives a more expensive car than Polly drives a ____ motorcycle.
 c. *Jones produced as successful a film as Smith produced a ____ play.
 d. *The Cubs started a more talented infield than the Sox started an ____ outfield.

(Kennedy and Merchant 2000, 92)

Kikuchi (1987) shows that the QCCs (CD) in Japanese show sensitivity to island constraints (e.g. the Complex NP island) as in (6), and thus argues that a null Op movement is involved in its derivation, as standardly assumed for its English counterpart (by e.g. Chomsky 1977). Here, the Op is moving out of a complex NP *sono tukue-de yonde ita hito* ‘the person who was reading at the table.’ The same can be said for the CSD counterparts with an overt NP *zassi-o* ‘magazine-Acc’ in the comparative clause, as in (7).

- (6) a. *[[sono tukue-de e_i e yonde ita] hito-oi John-ga nagutta yorimo] Paul-wa takusan

¹⁸ I will come back to this issue later in the next chapter.

that table-on read Asp person-Acc John-Nom hit than Paul-Top many
hon-o yonde ita

book-Acc read Asp

‘Paul read more books than John hit a person who was reading ____ at the table’

b. John-wa [Mary-ga t_i yonde ita Op_i] yori takusan-no hon-o yonda

John-Top Mary-Nom read Asp than many-Gen book-Acc read

Cf. John read more books than [Op_i Mary read t_i books]

(7) a. *[[sono tukue-de t_i zassi-o yonde ita] hito-o_i John-ga nagutta yorimo] Paul-wa

that table-on magazine-Acc read Asp person-Acc John-Nom hit than Paul-Top
takusan hon-o yonde ita.

many book-Acc read Asp

‘Paul read more books than John hit a person who was reading ____ magazines at the table’

b. John-wa [Mary-ga t_i zassi-o yonde ita Op_i] yori takusan-no hon-o yonda

John-Top Mary-Nom magazine read Asp than many-Gen book-Acc read

Cf. John read more books than [Op_i Mary read t_i magazines]

Since it is assumed that what is moved in Japanese comparatives is a quantifier corresponding to English *x-many*, we need to note that Japanese has two types of quantifiers that are relevant here:

(i) a case-attached quantifier which precedes its modifying nominal, where [numeral + classifier] string has a genitive marker *–no*; (ii) a case-less quantifier (floating quantifier), which appears following the noun and does not have a case marker, as shown below.

(8) a. John-wa [san-satu-no] hon-o katta ... (i)

John-Top 3-CL-Gen book-Acc bought

'John bought three books'

b. John-wa hon-o [san-satu] katta ... (ii)

John-Top books-Acc 3-CL bought

'John bought three books'

Ishii (1991) claims the moving operator involved in Japanese comparatives is a floating quantifier (FQ), since both the FQs and the quantity-compared clausal comparatives fail to occur with individual-level predicates while they do with stage-level predicates.

(9) a. ?*Gakusei-ga [_{FQ} san-nin] eigo-ga umai (Individual-level predicate)

Student-Nom 3-CL English-Nom good

'Three students are good at English'

b. Gakusei-ga [_{FQ} san-nin] eigo-o hanasita (Stage-level predicate)

Student-Nom 3-CL English-Acc spoke

'Three students spoke English'

(10) a. ?*kono kurasu-dewa gakusei-ga _{t_i} eigo-ga umai (Individual-level predicate)

this class-in student-Nom English-Nom good

[_{FQ} x-nin]_i yorimo takusan-no gakusei-ga hurasugo-ga umai

x-CL than many-Gen student-Nom French-Nom good

'More students are good at French than are good at English'

b. kinoo-no kaigi-dewa hito-ga t_i eigo-o hanasita (Stage-level predicate)

yesterday-Gen meeting-in person-Nom English-Acc spoke

[_{FQ} x-nin]_i yorimo takusan-no hito-ga huransugo-o hanasita

X-CL than many-Gen people-Nom French-Acc spoke

'More people spoke French than spoke English in yesterday's meeting'

Therefore, I assume here that the moving operator in Japanese quantity-compared clausal comparatives is a case-less (floating) quantifier.

3.1.2. Explanation of the Missing DCC in Japanese Based on the LBC

I claimed in Hattori (2018) that prohibition on DCCs in Japanese can be explained based on the LBC by assuming that the null Op (= null FQ) in QCC is moved from non-left branch position while the degree Op in DCC must be moved from the left-branch position.

The Japanese FQ *takusan* 'many' can be scrambled as in (11a) while the genitive Case-attached quantifier *takusan-no* 'many-Gen' cannot be moved out as in (11b). On the other hand, the degree expression in Japanese *totemo* 'very' has to appear in the left-branch position and thus cannot be scrambled as shown in (12).

(11) a. [*takusan*]_i watasi-wa hon-wo [~~*takusan*~~]_i katta

many-FQ I-Top books-Acc many bought

'I bought many books'

b. *[*takusan-no*]_i watasi-wa [[~~*takusan-no*~~]_i hon-o] katta


many-Gen I-Top many-Gen books-Acc bought
 'I bought many books'

(12) *[*totemo*]_i watasi-wa [[~~*totemo*~~]_i nagai] kasa-o katta
 very I-Top many long umbrella-Acc bought
 'I bought a very long umbrella'

If the Op involved in the Japanese QCC is the null FQ as Ishii (1991) shows, then there would be no LBC violation in Japanese QCC as the Op moves out of a non-left branch position as in (13).

(13) Japanese QCC: ✓


John-wa [Mary-ga zassi -o _{t_i} utta] [_{FQ} Op]_i yori takusan hon-o katta
 -Top -Nom magazine -Acc sold than many book-Acc bought
 'John bought more books than Mary bought magazines.'



In the Japanese DCC, however, the Op is the null degree expression which appears in the same left branch position as *totemo* 'very'. Since the degree expression in Japanese does not have a “floating” counterpart, the movement of the Op in Japanese DCC would always end up with an LBC violation as in (14) below. This is the reason why DCCs are disallowed in Japanese.

(14) Japanese DCC: LBC violation

*Kono teeburu-wa [ano doa -ga [_{t_i} hiroi]] Op_i yori takai.
 This table-Top that door -Nom wide than tall



‘This table is taller than that door is wide.’

On the otherhand, English null Op is not base-generated in the left-branch position, but adverbial position (following Izvorski 1995) regardless of QCC or DCC, and moves out from there, as shown in (15). Thus, the LBC would not be violated in either QCC or DCC.

- (15) a. John bought more books than Op_i [Mary bought [magazines] t_i].
b. This table is taller than Op_i [that door is [wide] t_i].

This LBC-based analysis, however, has problems when we compare QCC/DCC availability with the sensitivity to the LBC in other languages, which I will show later in the next section (3.2.).

3.1.3. Explanation of the Missing DCC in Japanese Based on Semantics

The more or less standard theory (Heim 2000), which has been used for analyzing semantics in English comparatives, can be applied to Japanese counterpart. For example, CD-DCC in (16a) would have the following semantics as in (16b-e).

- (16) a. Taroo bought a longer umbrella than Hanako did:
b. [[-er [1 [than Hanako did buy a t₁ long umbrella]]]
[1 [Taroo bought a t₁ long umbrella]]]
c. [[-er]] (λ d. H. bought a d-long umbrella) (λ d. T. bought a d-long umbrella)
d. $\max(\lambda$ d. T. bought a d-long umbrella) $>$ $\max(\lambda$ d. H. bought a d-long umbrella)
e. The degree d such that Taroo bought a d-long umbrella exceeds

the degree d' such that Hanako bought a d' -long umbrella

The CSD-DCC (Subcomparatives) in Japanese can be analyzed in the same way as its English counterpart as shown in (17). If the semantics is uniform like this, then the grammaticality difference between English and Japanese regarding the DCC cannot follow from semantics.

- (17) a. The shelf is taller than the door is wide
b. $[[[-er] [1 [\text{than the door is } t_1 \text{ wide}]]] [1 [\text{the shelf is } t_1 \text{ tall}]]]$
c. $[[[-er]] (\lambda d. \text{the door is } d\text{-wide}) (\lambda d. \text{the shelf is } d\text{-tall})$
d. $\max (\lambda d. \text{the shelf is } d\text{-tall}) > \max (\lambda d. \text{the door is } d\text{-wide})$
e. The degree d such that the shelf is d -tall exceeds the degree d' such that the door is d' -wide

To account for the relevant difference, Beck, Oda and Sugisaki (2004) propose a new pragmatic approach for Japanese comparatives. The basic idea is that Japanese *yori*, which is thought to be a counterpart to English *than*, is actually better paraphrased as ‘compared to’, which functions as a context setter, and this difference is the reason why Japanese does not allow certain types of clausal comparatives. For example, English approximation of the CD-DCC is shown below, where standard of comparison is assumed to be a free relative clause.

- (18) ?Compared to what Hanako bought, Taroo bought a long umbrella

According to Beck et al. (2004), a sentence like (18) is strange out of the blue, comparing to the inference given by quantity-compared clausal comparatives, since there is nothing to make (19b) salient in the context of (16).

- (19) a. $\max \lambda d. H. \text{ bought } d\text{-many umbrellas}) =$
 $\text{card}(\max(\lambda x. \text{ umbrella}(x) \ \& \ H. \text{ bought } x))$
 b. $\max(\lambda d. H. \text{ bought a } d\text{-long umbrella})$

In fact, they suggest that the sentences improve when a more relevant context is provided. For example, (20) is much better¹⁹ because the context in the form of the *yori*-clause establishes that *what John wrote* is relevant.

- (20) a. Mary-wa [John-ga kaita yori] nagai ronbun-o kaita
 Mary-Top [John-Acc wroteYORI] long paper-Acc wrote
 b. Compared to what John wrote, Mary wrote a long paper

Furthermore, adjective *expensive* is better in the sentence (21a) because when one talks about buying an umbrella, its price is salient, but its length is not.

- (21) a. Taroo-wa [Hanako-ga katta yori(mo)] takai
 Taroo-Top [Hanako-Nom bought YORI(mo)] expensive
 kasa-o katta.

¹⁹ The sentences in (20) and (21) are actually not better, i.e. they are ?* in my judgement.

umbrella-Acc bought

- b. Compared to what Hanako bought, Taroo bought an expensive umbrella

The ban on the CSD-DCC (subcomparatives) is explained in the same way. Applying the account by Beck et al., the Japanese subcomparative clause as in (22) is paraphrased as (23)²⁰.

(22) [[*doa-ga* *hiroi* (*no*²¹)] *yori* (*mo*)]

Door-Nom wide NO than even

(23) # Compared to the wide door, the shelf is tall.

Compared to the door that is wide, the shelf is tall

The oddness of this paraphrase leads to the ungrammaticality of subcomparatives in Japanese. Key difference here is that a *yori*-clause does not contribute a degree but has a relative-clause like semantics and contributes an individual. Beck et al. concludes that a Japanese *yori*-clause has no degree analysis because it has the negative value for the Degree Abstraction Parameter as shown below.

(24) Degree Abstraction Parameter (DAP):

A language { does/does not } have binding of degree variables in the syntax.

²⁰ No explanation is given as to why we cannot paraphrase it as "Compared to the width of the door, the shelf is tall", which would predict this sentence to be grammatical.

²¹ *no* used here in their examples is referred to as "nominalizer" in the literature (see Kuroda 1974, 1976, Cole 1987, Williamson 1987, Basilico 1996, Watanabe 2004, Hiraiwa 2005, Grosu 2012, among others), which transforms the clause into a nominal phrase (*the door is wide* → *the fact that the door is wide*). The subcomparative with the *no* is then no longer a clausal comparative.

They claim that this explains why Japanese lacks English-like negative island effects in its comparative sentences as shown in (25).

(25) a. John-wa [dare-mo kawa-naka-tta no yori]

John-Top anyone buy-Neg-Past NO YORI

takai hon-o katta

expensive book-Acc bought

'John bought a book that is more expensive than the book that nobody bought'

b. *John bought a more expensive book than nobody did.

Based on their analysis, the Japanese sentence (25a) is paraphrased as (26), where specific individual and not degree is taken as the standard of comparison so that specification of degree is not considered to be a problem.

(26) a. Compared to the one that nobody bought, John bought an expensive book.

b. daremo kawa-naka-tta no yori

anyone buy-Neg-Past NO YORI

c. [Op_i [[daremo e_i kawa] naka-tta]] -no

d. THE_C(λ x. nobody bought x)

'the one that nobody bought'

In the next section, I will discuss some problems of the contextual approach by Beck et al. (2004) and question its plausibility.

3.2. Problems with the Previous Analyses

3.2.1. The LBC and Cross-linguistic Variation

I will now show that the previous accounts face some problems. When we consider other languages, it is easy to find cases where an LBC-based explanation from the section 3.1.2 above does not work (see also footnote 6 in Chapter 2). For example, Polish allows LBC extraction (Corver 1992, Kennedy and Merchant 2000), but degree CD/CSDs are ungrammatical²², when the adjective is in a predicative position.

- (27) a. Jak długą sztukę napisał Paweł? (Kennedy and Merchant 2000, 104)
- how long play wrote Pawel
- ‘Lit: [How long a play]_i did Pawel write t_i?’
- b. [Jak długą]_i napisał Paweł [t_i sztukę]?
- how long wrote Pawel play
- ‘Lit: How long did Pawel write a play?’

- (28) a. * Maria jest wyższa niż Karol jest wysoki. (Bacskai-Atkari 2014, 2)
- Mary is taller than Charles is tall
- ‘Mary is taller than Charles is.’
- b. */??? Stół jest dłuższy niż biuro jest szerokie.

²² The grammaticality judgement of this sentence is confirmed by a Polish consultant, Marcin Dadan.

desk is longer than office is wide

‘The desk is longer than the office is wide.’

Another example comes from Serbo-Croatian (SC). The movement of the leftmost constituent of an NP in this language is generally possible (Bošković 2005, Uriagereka 1988).

(29) a. Čijeg_i si vidio [t_i oca]?

whose are seen father

‘Whose father did you see?’

b. Kakva_i si kupio [t_i kola]?

what-kind-of are bought car

‘What kind of a car did you buy?’

c. Ta_i je vidio [t_i kola].

that is seen car

‘That car, he saw.’

d. Lijepe_i je vidio [t_i kuće].

beautiful is seen houses

‘Beautiful houses, he saw.’

e. Koliko_i je zaradila [t_i novca]?

how-much is earned money

‘How much money did she earn?’

However, the degree CD with an adjective in an attributive position, which is unacceptable in Japanese, is also degraded in SC²³, as shown below (cf. (2)).

- (30) ?Ivan je kupio duži kišobran nego što je
Ivan.nom is bought.sg.m longer.acc.sg.m umbrella.acc.sg.m than what is
Marija prodala.
Marija.nom sold.sg.f
'Ivan bought a longer umbrella than Mary sold.'

The QCC counterpart is, on the other hand, perfectly grammatical.

- (31) Marija je napisala više članaka nego što je
Marija.nom.f is written.sg.f more article.gen.pl.m than what/that is
Ivan pročitao.
Ivan.nom.m read.participle.sg.m
'Mary wrote more papers than Ivan read.'

The attributive DCC-CD and the predicative DCC-CSD in these languages cannot be ungrammatical just because of an LBC violation, as the extraction of the left-branch elements are otherwise possible in the language.

²³ The judgement is checked by two consultants, Aida Talić and Ivana Jovović.

3.2.2. Problems with the Sematic Approach

3.2.2.1. *compared to* and *yor*

Beck et al. (2004) assumes that Japanese *yor* ‘than’ is better approximated as “compared to” rather than English *than*. However, this assumption is questionable since Japanese has *-to kuraberu to* ‘compared to’, which is literal translation of *compared to*. There are some instances that indicate *yor* behaves differently from both English *compared to* and its apparent Japanese counterpart *-to kuraberu to*. For example, in a context where “John is extremely stupid and Sally is less stupid,” Japanese *yor* comparative like the following is odd in that it cannot have the reading that Sally is stupid and the reading in (32b) is odd.

(32) a. Sally-wa John yori tensai da

Sally-Top John than genius Cop

b. #Compared to John, Sally is a genius

c. Sally is more genius than John

On the other hand, if we use *-to kuraberu to* instead, the sentence is acceptable in the same context, which indicates that *-to kuraberu to* in Japanese (and not the *yor*) is the counterpart of English *compared to*.

(33) John to kuraberu-to Sally-wa tensai-da

John with compare-cond Sally-Top genius-Cop

‘(Sally is stupid, but) if we compare her to John, Sally is a genius’

In addition, Beck et al. claimed that (18) is strange out of the blue, and that this is why the corresponding Japanese CD-DCC is unacceptable. It would be predicted, then, that the sentence would become acceptable if a more appropriate context is provided. This prediction, however, is not borne out as it is still unacceptable in a context where the length of umbrellas is compared as shown below.

- (34) A: Kono mise ni-wa nagai kasa-ga ippai utteiru kedo, kinoo dare-ga
 This shop in-Top long umbrella-Nom many selling but yesterday who-Nom
 yori nagai kasa-o katta-no?
 more long umbrella-Acc bought-Q
 ‘This shop sells a lot of long umbrellas, but who bought longer one yesterday?’
 B: ?*Taro-wa Hanako-ga katta yori nagai kasa-o katta –yo.
 Taro-Top Hanako-Nom bought YORI long umbrella-Acc bought –Cop

Therefore, it seems problematic to assume that Japanese *yori* is paraphrased as *compared to* and to analyze Japanese comparatives under that assumption.

3.2.2.2. Plausibility of the DAP: Shimoyama (2011)

Beck et al. (2004) claim that Japanese lacks DCC because abstraction over a degree in the language is not available, i.e. Japanese has a negative setting for the degree abstraction parameter (DAP). I will now consider the plausibility of this parameter based on some counter evidence in Japanese. Beck et al. (2004) along with Kennedy (2007) claim that the clausal complement of *yori* denotes an individual and not a degree, where it involves the maximalization of individuals, i.e. $\max(\lambda x.$

Taro bought x) and not maximalization of degrees, i.e. $\max(\lambda d. \text{Taro bought a } d\text{-expensive book})$ (Jakobson 1995). Thus Japanese has a negative setting for the Degree Abstraction Parameter (DAP) repeated below.

(35) Degree Abstraction Parameter (DAP):

A language { does/does not } have binding of degree variables in the syntax.

Shimoyama (2011), however, provides evidence for the presence of genuine clausal comparatives with degree abstraction structures in Japanese. First, there are grammatical predicative adjectival comparatives as in (36), for which degree analysis like (37) seems to be plausible as shown below.

(36) [Hanako-no te] -wa [Taro-ga $omotteita$]-yori ookii.

Hanako-GEN hand-Top Taro-NOM thought -than big

‘Hanako’s hands are bigger than Taro thought (they were)’

(37) a. [-er [op_1 than Taro thought they were $t_{1,d}$ big]]₂ [Hanako’s hands are $t_{2,d}$ -big]

b. $\max(\lambda d. H\text{'s hands are } d\text{-big}) > \max(\lambda d. \text{Taro thought they were } d\text{-big})$

The individual analysis of Beck et al. (2004) as in (38) does not give the precise meaning of the sentence (36). Here the 3-place *-er* as in (39) is used. (see Heim 1985, Bhatt & Takahashi 2007, 2008, Kennedy 2007, Nissenbaum 2000, Barker 2007, Kennedy and Stanley 2008)

(38) a. [Hanako’s hands] [-er_{3-place} [than [wh₃ Taro thought $t_{3,e}$]]] [2 [1 are [$t_{2,d}$ -big]]]

- b. $\max(\lambda d. H\text{'s hands are } d\text{-big}) > \max(\lambda d. \max(\lambda x. \text{Taro thought } x) \text{ are } d\text{-big})$
- c. Hanako's hands are bigger than the thing(s) Taro thought (of).

$$(39) [[-er_{3\text{-place}}]] = \lambda x_e. \lambda P_{d,et}. \lambda y_e. \max(\lambda d. P(d)(y)) > \max(\lambda d. P(d)(x))$$

Secondly, Shimoyama (2011) claims that Japanese in fact shows negative island effects, which is assumed to be attested only when there is the degree abstraction in Beck et al. (2004).

(40) * John-wa [**dare-mo/Mary-ga kawanakatta**]-yori

John-TOP anybody/Mary-NOM didn't.buy -than

takai hon-o katta.

expensive book-ACC bought

'John bought a more expensive book than nobody did/Mary didn't buy.'

Here, the ungrammaticality of the example can be explained by saying that $\max(\lambda x. \text{Nobody bought } x)$ is undefined as in English. The plain clausal complement of *yori* thus should receive a standard degree analysis. Crucially, the sentence which Beck et al. claim to be an example showing the lack of a negative island effect, actually has a *-no* inserted at the end of the clause without any explanation.

(41) a. John-wa [dare-mo kawa-naka-tta **no** yori]

((6) in Beck et al. 2004, 290)

John-Top anyone buy-Neg-Past NO YORI

takai hon-o katta

expensive book-Acc bought

'John bought a book that is more expensive than the book that nobody bought'

b. *John bought a more expensive book than nobody did.

This example with *–no* cannot be treated parallel to its English plain clausal counterpart, since the *no* in Japanese used here in their examples is referred to as “nominalizer” in the literature (see Kuroda 1974, 1976, Cole 1987, Williamson 1987, Basilico 1996, Watanabe 2004, Hiraiwa 2005, Grosu 2012, among others), which transforms the clause into a nominal phrase headed by the nominalizer (*nobody did/Mary didn't buy* → *the one that nobody bought/ the one Mary didn't buy*). In fact, the ungrammatical DCC becomes grammatical with the nominalizer *–no* in Japanese.

(42) a. ?* Taroo-wa [_{CP} Hanako-ga katta] yori nagai kasa-o katta

Taroo-Top Hanako-Nom bought than long umbrella-Acc bought

‘Taroo bought a longer umbrella than Hanako bought.’

b. Taroo-wa [[Hanako-ga katta] **no**] yori nagai kasa-o katta.

‘Taroo bought a longer umbrella than the one Hanako bought.’

The subcomparative with the *no* is no longer a clausal comparative, but a phrasal comparative with a relativized clause modifying *–no* ‘the one’ as the interpretation of the sentence in (42b) here suggests. Therefore, the sentence in (41) cannot be a clear piece of evidence that shows the lack of a negative island effect in Japanese.

In sum, Japanese has some instances where the standard degree analysis is more plausible and the DAP-based analysis of Beck et al. (2004) seems implausible.

3.2.3. Syntactic Classification

The previous analyses of comparatives have problems regarding the data, in that more detailed distinctions regarding the *than*-complement need to be paid attention to. Namely, the phrasal-clausal distinction regarding the *than* complement, the degree-quantity distinction among the clausal comparatives and the attributive-predicative distinction with respect to the adjective involved in a degree clausal comparative should be taken into consideration when we look at the cross-linguistic variation in this domain.

First, the phrasal/clausal distinction of the *than*-complement is important as even the degree comparatives are grammatical when *yor*i takes a phrasal complement in Japanese unlike its clausal counterparts.

(43) Taroo-wa [_{NP} Hanako-no kasa] yori nagai kasa-o katta.

T-Top H-Gen umbrella than long umbrella-Acc bought

‘Taroo bought a longer umbrella than Hanako’s umbrella’

Cf. (2a):

?* Taroo-wa [_{CP} Hanako-ga katta] yori nagai kasa-o katta

Taroo-Top Hanako-Nom bought than long umbrella-Acc bought

‘Taroo bought a longer umbrella than Hanako bought.’

(44) Kono teeburu-wa [_{NP} ano doa] yori nagai.

This table-Top that door than long

‘This table is longer than that door’

Cf. (4a):

*Kono teeburu-wa [_{CP} ano doa –ga hiroi] yori takai.

This table-Top that door –Nom wide than tall

‘This table is taller than that door is wide.’

This phrasal-clausal distinction is crucial when we nominalize the clause using the “nominalizer” *no* in Japanese (recall Beck et al. 2004’s examples). The degree CD or CSD becomes grammatical with *no*, as shown below.

(45) a. Taroo-wa [_{NP} [_{CP} Hanako-ga katta] no] yori nagai kasa-o katta

Taroo-Top Hanako-Nom bought NML than long umbrella-Acc bought

‘Taroo bought a longer umbrella than [_{NP} the one Hanako bought].’

b. Kono teeburu-wa [_{NP} [_{CP} ano doa –ga hiroi] no] yori takai.

this table-Top that door –Nom wide NML than tall

‘This table is taller than [the width of that door].’

Here, the sentences improve as *than* complements are NPs and no longer CPs, because the phrasal degree comparatives are not prohibited in Japanese²⁴, as shown above in (43/44). Thus, attention

²⁴ Note that it is generally held that a relative clause derivation in Japanese does not involve Op-movement (see Saito 1985).

should be paid here to the categorial status of the relevant element, in order to disambiguate the phrasal comparatives from their clausal counterparts.

Second, the syntactic distinction between quantity comparative clause and degree comparative clause would be crucial in explaining the cross-linguistic variation as the semantic approach would treat both QCC and DCC in common. As we already saw, traditionally the degree CD or the subcomparatives (degree CSD) are analyzed as comparison between degrees, where the sets of degrees provided by matrix and *than*-clause through abstraction over a degree variable are maximized by the comparative morpheme *-er*. (46) and (47) are repeated here.

(46) a. Taroo bought a longer umbrella than Hanako did:

b. $[[[-er] [1 [than\ Hanako\ did\ buy\ a\ t1\ long\ umbrella]]]]$

$[1 [Taroo\ bought\ a\ t1\ long\ umbrella]]]$

c. $[[[-er]]] (\lambda d. H. \text{ bought a d-long umbrella}) (\lambda d. T. \text{ bought a d-long umbrella})$

d. $\max(\lambda d. T. \text{ bought a d-long umbrella}) > \max(\lambda d. H. \text{ bought a d-long umbrella})$

e. The degree d such that Taroo bought a d -long umbrella exceeds

the degree d' such that Hanako bought a d' -long umbrella

(47) a. The shelf is taller than the door is wide

b. $[[[-er] [1 [than\ the\ door\ is\ t1\ wide]]]] [1 [the\ shelf\ is\ t1\ tall]]]$

c. $[[[-er]]] (\lambda d. \text{ the door is d-wide}) (\lambda d. \text{ the shelf is d-tall})$

d. $\max(\lambda d. \text{ the shelf is d-tall}) > \max(\lambda d. \text{ the door is d-wide})$

e. The degree d such that the shelf is d -tall exceeds the degree d' such that

the door is d' -wide

As for the CD-QCC, for example, Beck et al. (2009) (following Heim 2001) treat it as comparison of degrees in the same fashion.

(48) a. Mr Bingley keeps more servants than Mr Bennet does.

b. $[[[-er [than [2 [Mr Bennet does [\forall P \text{ keep } t_2 \text{ many servants}]]]]]]]$

$[2 [Mr Bingley keeps t_2 \text{ many servants}]]]$

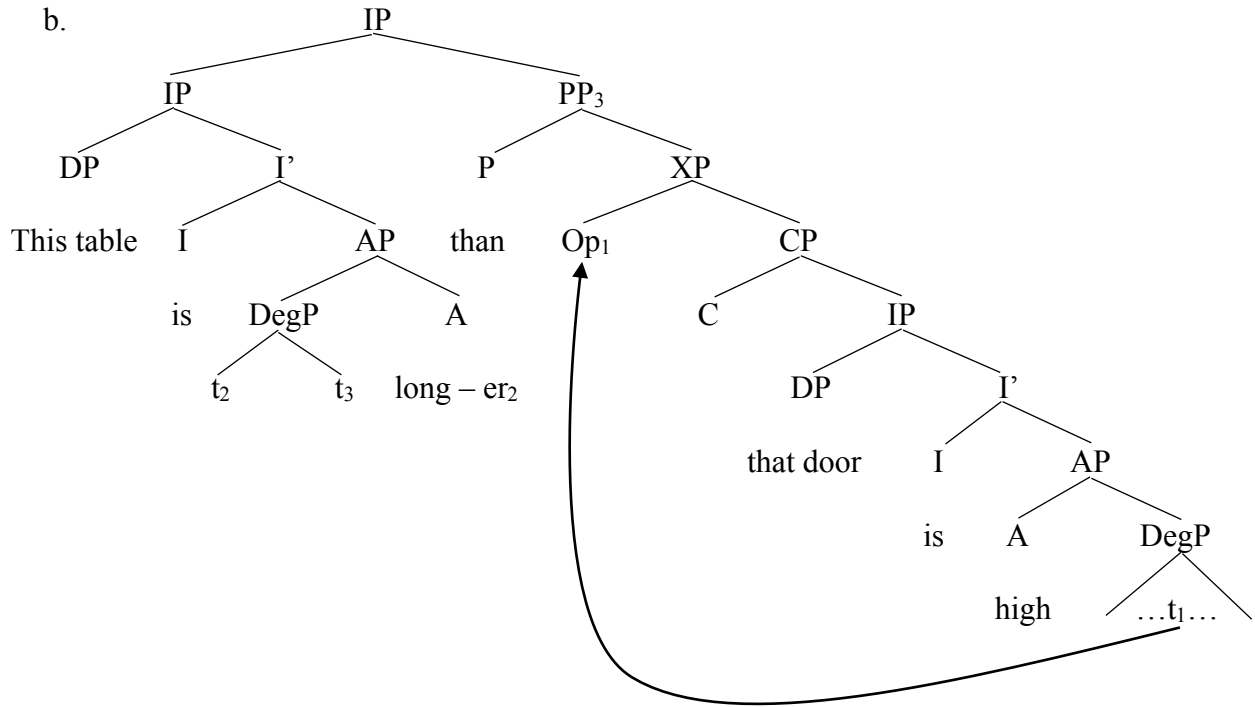
c. $[[[-er]] (\lambda d. \text{Mr. Bennet keeps } d\text{-many servants}) (\lambda d. \text{Mr. Bingley keeps } d\text{-many servants})]$

d. $\max (\lambda d. \text{Mr. Bingley keeps } d\text{-many servants}) > \max (\lambda d. \text{Mr. Bennet keeps } d\text{-many servants})$

e. The degree d such that Mr. Bingley keeps d -many servants exceeds the degree d' such that Mr. Bennet keeps d' -many servants

Assuming a uniform semantics for QCC and DCC leaves syntax to account for the cross-linguistic grammaticality difference here. Syntactically, the degree of adjective and the quantifier (including the floating quantifier) in relation to the modified head nouns are treated differently, which directly affects the analysis as this means that the base-generated position of the Op in QCC and an Op in DCC is different. For instance, following von Stechow (1984), Heim (2000), Beck et al. (2009) and Izvorski (2000), I assumed that the Op in degree CSD (subcomparatives) in English is base-generated in the DegP which is the sister of the A head. Example (32) from Chapter 2 is repeated as (49) below.

(49) a. This table is wider than that door is high.

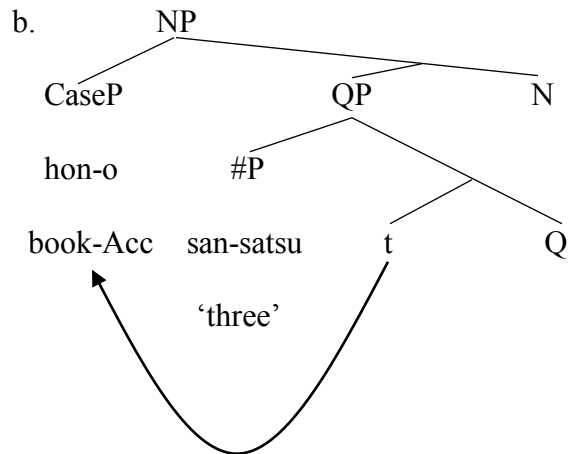


Regarding the position of Op in QCC on the other hand, for example, if we assume that the moving Op in Japanese quantity CD/CSD is the floating quantifier, then the Op would be base-generated in the spec of QP, following Watanabe (2006), as shown below (Here *san-satsu* ‘three-CL’ is the floating quantifier).

(50) a. hon-o san-satsu

Book-Acc 3-CL

‘three books’



What is important here is that the derivation of clausal comparatives is syntactically different between DCC and QCC regarding the movement of the Op involved. This syntactic difference is potentially crucial in order to explain the cross-linguistic variation and thus should be taken into consideration.

Third, the distinction between attributive and predicative adjectives should be taken into consideration. As we saw, in the degree CSD used in the previous literature, the adjective is often a predicative one while the degree CD cases use an adjective in an attributive position. Thus, the literature generally does not use minimal pairs for degree CD and degree CSD.

(51) a. CD-DCC (attributive)

John bought a **longer** umbrella than Hanako did/bought.

b. CSD-DCC (predicative)

This table is **taller** than that door is **wide**.

The missing combinations in data in the literature, i.e. predicative CD-DCC and attributive CSD-DCC, should be checked cross-linguistically as well, especially because the latter is ungrammatical in English (Pilch 1965, Pinkham 1985, Kennedy and Merchant 2000).

(52) a. CD-DCC (predicative)

John is more intelligent than Bill is _____. (Chomsky 1977, 123)

b. CSD-DCC (attributive)

*I bought a more expensive car than I sold a _____ bus. (Pilch 1965, 52)

On the other hand, the element indicating quantity that is compared in clausal comparatives does not appear in a predicative position in the examples given in the literature (to my knowledge). It is always in the attributive position in both the CD and CSD.

(53) a. CD-QCC (attributive)

Taroo bought **more** umbrellas than Hanako did/bought.

b. CSD-QCC (attributive)

John bought **more** books than Mary bought ~~x-many~~ magazines.

However, the element indicating quantity in a clausal comparative can be placed in the predicative position in some specific context as shown below (p.c. Emma Nguyen).

(54) CD-QCC (predicative)

The number of people is **more** than it was ~~x-many~~ before

Thus, the distinction between predicative and attributive positions should be considered in addition to the CD-CSD or quantity-degree contrast.

Finally, there are some cases of degree clausal comparatives that should be separated from the DCC-CSD. For instance, Izvorski (2000) briefly discusses the predicative CD with an adjective with a PP complement (e.g. *proud*). This type of CSD is possible (p.c. Jonathan Bobaljik) as shown below.

(55) a. Mary is prouder of John than he is²⁵. (Izvorski 2000, 118)

b. Mary is prouder of her students than Bill is ~~proud~~ of his family.

Recall that Bresnan (1975) referred to a clausal comparative where “only a subpart of the compared clause is deleted”, as Comparative Subdeletion.

(56) a. They have many more enemies than we have ____ friends.

b. Taroo bought more magazines than Hanako bought ____ books.

c. Ann is less happy now than she was ____ sad before.

d. This table is longer than that door is ____ wide.

²⁵ Izvorski (2000) claims that this sentence has the following structure, where she does not specify the structural position of the Op.

(i) Mary is prouder of John than [wh_i [he is t_i ~~proud of John~~]

Here the Op moves to the CP-spec position by itself without pied-piping the AP *proud of John*, which would otherwise cause a Condition B violation. Izvorski, however does not give any explanation as to why this movement of the Op can avoid the LBC.

Based on this, the sentence in (55b) can be categorized as the degree CSD as its clause is partly elided. However, this sentence is different from the other degree CSDs like (56c) or (56d) in that the same adjective *proud* is used in both the main clause and the comparative clause in (55b) while different adjectives (*happy* vs *sad*, *long* vs. *wide*) are used in (56c, d), in addition to the difference caused by the presence of the PP complement in (55b). Thus, the degree clausal comparative with PP complement should be separated from the ordinary degree CSD.

The next section will conduct a cross-linguistic survey of comparatives based on the syntactic classifications discussed above, taking the following distinctions into consideration, i.e. “phrasal/clausal”, “quantity/degree”, “predicative/attributive”, and “CD/CSD”.

3.3. Cross-linguistic Survey of *than*-comparatives

Taking the syntactic distinctions discussed in the previous section (listed below) into consideration, I will look at cross-linguistic data language by language, with respect to the following criteria.

(57) a. Phrasal vs Clausal

b. Quantity-comparison vs Degree-comparison

c. Base position of the null Op: Attributive vs Predicative

d. Comparative Deletion vs Comparative SubDeletion

3.3.1. English²⁶

²⁶ The grammaticality of the English sentences was checked by consultant Emma Nguyen.

In English, quantity comparison and degree comparison sentences are available even without the preposition *than*. Roman numerals (i) through (x) are used to mark the categorization, which I will use for other languages as well.

(58) Comparatives without *than* ... (i)

- a. This table is higher (Degree)
- b. John has more books (Quantity)

The preposition *than* can take a single nominal complement in both quantity and degree comparisons. I refer to such cases as phrasal comparatives²⁷.

(59) Phrasal Quantity Comparative ... (ii)

Mary has more books than magazines

(60) Phrasal Degree Comparative ... (iii)

- a. Mary is taller than him. (Predicative)
- b. Mary has a more interesting book than Harry Potter. (Attributive)

As already mentioned, CD and CSD are possible when the quantities are compared, where the quantifier would appear in an attributive position.

(61) Attributive Quantity Comparative Deletion (CD) ... (iv)

²⁷ I assume no Op movement is involved in their derivation.

- a. Mary has more books than Bill has _____. (Izvorski 1995, 203)
- b. Mary wrote more papers than John did _____. (Beck et al. 2004, 289)

(62) Attributive Quantity Comparative SubDeletion (CSD) ... (v)

- a. John has more books than Bill has ____ magazines. (Izvorski 2000, 95)
- b. She has more boyfriends than she has ____ books.

The predicative version is also possible as a CD sentence. The CSD of this version is hard to construct since there cannot be an undeleted element in the comparative clause in the predicative position in a quantity comparison unlike its degree counterpart, where two different predicative adjectives are used in matrix and comparative clauses.

(63) Predicative Quantity CD²⁸ ... (vi)

The number of people is more than it was ____ before.

Now, turning to degree clausal comparatives, both the CD and CSD are possible when the adjective is in the predicative position as mentioned before.

(64) Predicative degree CD ... (vii)

- a. Mary is prettier than Jane is _____.
- b. John is more intelligent than Bill is _____. (Chomsky 1977, 88)

²⁸ A consultant pointed out that this sentence is often used in colloquial speech. Formally the sentence should use an adjective *greater*, rather than *more*.

(i) The number of people is greater than it was before.

(65) Predicative degree CSD ... (viii)

- a. This table is longer than that door is _____ wide. (Bresnan 1975)
- b. The desk is higher than it is _____ wide. (Townsend 1974, modified)
- c. Ann is less happy now than she was _____ sad before. (Izvorski 1995)

When the adjective is in the attributive position, the CSD is ungrammatical in English (as Pinkham 1985 points out) while the CD counterpart is still grammatical.

(66) Attributive degree CD ... (ix)

Taroo bought a longer umbrella than Hanako did a _____ ~~long umbrella~~.

(Beck et al. 2004, 290)

(67) Attributive degree CSD ... (x)

- a. *Taroo bought a longer stick than Hanako bought an umbrella. (Ishii 1991, 142)
- b. *Bill bought a longer umbrella than Mary sold a _____ cane.
- c. *John makes better cakes than he can make _____ cookies. (Izvorski 1995, 209)

Based on the categorization here as the diagnostics, I will look at 14 different languages from the next subsection.

(68) i. Comparatives without *than*

ii. Phrasal Quantity Comparative

- iii. Phrasal Degree Comparative
- iv. Attributive Quantity Comparative Deletion (CD)
- v. Attributive Quantity Comparative SubDeletion (CSD)
- vi. Predicative Quantity CD
- vii. Predicative degree CD
- viii. Predicative degree CSD
- ix. Attributive degree CD
- x. Attributive degree CSD

Since I have used English to illustrate these conditions, below I summarize the values of (68 i-x) for English.

- (68') i. ✓ This table is higher.
- ii. ✓ Mary has more books than magazines.
- iii. ✓ Mary has a more interesting book than Harry Potter.
- iv. ✓ Mary wrote more papers than John did.
- v. ✓ John has more books than Bill has magazines.
- vi. ✓ The number of people is more than it was before.
- vii. ✓ John is more intelligent than Bill is.
- viii. ✓ This table is longer than that door is wide.
- ix. ✓ Taroo bought a longer umbrella than Hanako did.
- x. *Bill bought a longer umbrella than Mary sold a cane.

3.3.2. German

German also has comparatives²⁹. The comparatives can drop the *than* (*als* in German) phrase completely as shown below.

(69) Comparatives without *than* ... (i)

a. Dieser Tisch ist höher.

This.Nom table is higher

‘This table is higher’ (Degree)

b. John hat mehr Bücher

has more books

‘John has more books’ (Quantity)

Phrasal complements of *als* ‘than’ are available for both quantity- and degree-comparisons.

(70) Phrasal Quantity Comparative ... (ii)

Mary hat mehr Bücher als Zeitschriften.

has more books than magazines

‘Mary has more books than magazines’

(71) Phrasal Degree Comparative ... (iii)

a. Ich bin größer als Peter³⁰.

²⁹ Checked by a consultant Sabine Laszakovits

³⁰ I treat the comparatives in which *than* is followed by a single nominal constituent as phrasal comparatives.

I be.1SG.Pres taller than Peter

‘I am taller than Peter.’

(Bacskai-Atkari 2014)

- b. Mary hat ein interessant-er-es Buch als "Harry Potter"

Mary has a interesting-cmpr-n.sg.nom book than

‘Mary has a more interesting book than Harry Potter’

The Quantity clausal comparatives are good as CDs or CSDs when in attributive positions. The word order here slightly differs from the English counterpart because of the Verb Second property (and the *haben/hat* ‘have/has’ in the second position is used in combination with the verb in perfect tense in the base generated position) of the main clauses. The comparative clause can be embedded inside an embedded clause as in (72c).

(72) Attributive Quantity Comparative Deletion (CD) ... (iv)

- a. Zweifellos hat Hans mehr Brote gegessen als [seine Mutter bestellt hat].

doubtless has John more sandwiches eaten than his mother ordered has

‘John undoubtedly ate more sandwiches than his mother ordered.’ (Lechner, To appear)

- b. Millhouse hat mehr Leute besucht als [der Fritz eingeladen hat]

Millhouse has more people visited than the Fritz invited has

However, there has been a debate since early 1970s (e.g. Hankammer 1973) whether a phrasal complement of *than* should be analyzed as a reduced clause (at least in some languages), since the phrasal complement appears as nominative in German, which can be taken to indicate that it is a subject of the elided clause.

- (i) Ich bin größer als er.

I am taller than he.Nom

‘I am taller than him.’

If this is the right analysis and if this is taken to indicate that *als* does not assign Case to its overt complement DP, based on my account of the nature of Op-movement discussed in Chapter 2, we may need to assume then that *als* can assign an (abstract) inherent Case only to a null Op projection, where *als* can have an Op projection but not a DP as its complement. (Alternatively, this could be an issue of selection given that the null Op projection is actually an NP, not a DP, as discussed in more detail below).

‘Millhouse visited more people than Fritz invited’ (Lechner 1999, 140)

c. weil Hans mehr Bücher [als Peter gelesen hat] gekauft hat

since Hans more books than Peter read has bought has

‘since John bought more books than Peter read’ (Lechner 1999, 185)

(73) Attributive Quantity Comparative SubDeletion (CSD) ... (v)

John hat mehr Bücher als Bill Zeitschriften (hat).

has more books than magazines has

‘John has more books than Bill has ____ magazines.’

The problem with the predicative version of quantity CD in German is that this is most naturally expressed in the following way, with an adjective groß ‘big’. Thus, this is no longer a quantity comparison but a predicative degree CD.

(74) Predicative Degree CD ... (vii)

a. Die Anzahl an Personen ist **größer** als (sie) früher war.

The number.F of people is bigger than it earlier was

‘The number of people is bigger than it was ____ before’

Cf. The number of people is more than it was ____ before.

b. Maria ist **größer** als er war.

Maria is taller than he was

‘Maria is taller than he was.’

However, in a certain context, predicative quantity CD is possible (p.c. Jonathan Bobaljik and Sabine Laszakovits), as shown below.

(75) Predicative Quantity CD

...(vi)

Das ist mehr als es früher war

that is more than it earlier was

'That is more than it was before'

Context: in a news paper, "German is sending 2600 troops to some operation..."

The CSD counterpart of predicative degree clausal comparatives are reported to be available in the literature.

(76) Predicative Degree CSD

...(viii)

- a. Der Tisch ist länger als das Büro breit ist. (Beck et al. 2009)

the.MASC table is longer than the.NEUT office wide is

'The table is longer than the office is wide'

- b. Maria ist größer als Johann groß ist. (Bacskai-Atkari 2014, 117)

Mary is taller than John tall is

'Mary is taller than John is'

Attributive degree clausal comparatives are grammatical only when they are the CDs, but not CSDs, which patterns with their English counterparts.

(77) Attributive Degree CD ... (ix)

- a. John hat einen längeren Schirm gekauft als Mary.
John has a longer umbrella bought than Mary
'John bought a longer umbrella than Mary.'
- b. John backt jetzt bessere Kuchen, als er früher backen konnte.
John bakes now better cakes than he earlier bake could
'John makes better cakes now than he could make before.'

(78) Attributive degree CSD

- *Ralf hat eine größere Wohnung als Michael ein Haus.
Ralph has a-ACC.FEM bigger-ACC.FEM flat than Michael a-ACC.NEUT house
'Ralph has a bigger flat than Michael a house. (Bacskai-Atkari 2014, 133)

3.3.3. French³¹

Turning to some Romance languages, French employs a partitive strategy, i.e. nouns are realized as oblique complements of preposition *de* in the quantity comparatives and attributive degree comparatives. The strategy is also used even in the quantity comparatives without *than* (*que* in French), or phrasal comparatives.

(79) Comparatives without *than* ... (i)

- a. Cette table est plus haute Degree
This table is more high

³¹ When not cited, the French sentences are provided by a consultant, Alexandre Vaxman.

‘This table is higher’

b. Jean a plus de livres. Quantity

Jean has more of books

‘John has more books’

(80) Phrasal Quantity Comparative ... (ii)

Marie a plus de livres que de magazines.

M has more of books than of magazines

‘Mary has more books than magazines’

(81) Phrasal Degree Comparative ... (iii)

a. Anne est plus fatiguée que Marie.

Ann is more tired-FEM than Mary

‘Ann is more tired than Mary.’ (Bacskai Atkari 2014, 192)

b. Marie a un livre plus intéressant qu' "Harry Potter".

has a book more interesting than

‘Mary has a more interesting book than “Harry Potter”’

Both the CD and CSD are possible in French where quantity is compared in the attributive positions.

(82) Attributive Quantity Comparative Deletion (CD) ... (iv)

a. Il a acheté plus de livres qu’il ne pouvait en porter.

He bought more of books than EXPL could pro carry

‘He bought more books than he could carry’ (Pinkham 1985, 6)

b. J'ai plus de livres que Paul n'en a.

‘I have more books than Paul has.’ (Pinkham 1982, 16)

(83) Attributive Quantity Comparative SubDeletion (CSD) ... (v)

Marie lit plus de livres que Jean ne lit de revues.

Mary reads more of book-Pl than John EXPL read-3.Sg.Pres of journal-Pl

‘Mary reads more books than John reads journals’

However, the French counterpart of the English predicative quantity CD is expressed in a different way as in the case of German counterpart, i.e. with an expletive subject and the quantifier in the attributive position.

(84) Il y a plus/davantage de gens qu' (il n'y avait) avant/auparavant.

It has more of people than there was before

‘There are more people than (there was) before.’

Turning now to degree clausal comparatives, predicative CD and CSD are possible in French, as shown below³².

³² Snyder (1995) claims that the predicative degree CSD in French is impossible, based on the sentence shown below. The problem with this sentence seems to be the lack of expletive *ne* in the comparative clause. The same expletive *ne* appears in quantity clausal comparatives in French, too, e.g. (82/83). I treat this expletive as an obligatory element in French clausal comparatives.

(i) *La porte est plus haute, que la fenêtre est large
the-Fem door is more high-Fem than the-Fem window is wide

(85) Predicative Degree CD ... (vi)

Jean est plus grand que je ne le suis.

is more tall than I EXPL am

'Jean is taller than I am (it).' (Pinkham 1985, 20)

(86) Predicative Degree CSD ... (vii)

La porte est plus haute que la fenêtre n'est large

The.FEM door is more high than the window EXPL'is wide

'The door is higher than the window is wide.'

Pinkham (1985) observes that an attributive degree clausal comparative is grammatical when it is the CD but not when it is the CSD.

(87) Attributive Degree CD ... (ix)

Il a de plus gentils voisins qu'il n'en avait.

He has of more nice neighbors than'he EXPL had

'He has nicer neighbors than he used to have.' (Pinkham 1985, 52)

(88) Attributive Degree CSD ... (x)

a. ??Elle est meilleure pédiatre qu'elle n'est chirurgienne.

she is better pediatrician than'she EXPL'is surgeon

'The door is taller than the window is wide'

'She is a better pediatrician than she is a surgeon.' (Pinkham 1985, 23)

b. *Il a de plus gentils voisins qu'il n'a d'amis.

He has of more nice neighbors than he EXPL'have of'friends

'He has nicer neighbors than he has friends.' (Pinkham 1985, 59)

3.3.4. Italian³³

The comparatives without *than* (*che* or *di* in Italian) phrase look similar to the ones in English, German or French.

(89) Comparatives without *than* ... (i)

a. Questo tavolo è più alto. Degree

This table is more tall

'This table is higher'

b. Gianni ha più libri. Quantity

Gianni has more books

'John has more books'

The phrasal comparatives are expressed in the following way, with *che* 'than' introducing the comparative phrases both for quantity- and degree-comparisons.

(90) Phrasal Quantity Comparative ... (ii)

³³ Italian data, where not cited, are provided by a consultant Roberto Petrosino.

Maria ha più libri che riviste.

Maria has more books than magazines

‘Mary has more books than magazines’

(91) Phrasal Degree Comparative ... (iii)

Raulo è più alto che Alessandro

Ralph is more tall-MASC than Alexander

‘Ralph is taller than Alexander.’ (Bacskai-Atkari 2014, 47)

In Italian clausal comparatives, overt *wh* phrase *quanto* is used in the beginning of the embedded clauses³⁴ as shown below.

(92) Attributive Quantity Comparative Deletion (CD) ... (iv)

Maria ha mangiato più biscotti di quanti_i ne ha mangiati *t_i* Giulia.

Mary has eaten more cookies than WH-PLUR of-them has eaten Julia

‘Mary ate more cookies than Julia ate.’ (Donati 1997, 149)

(93) Attributive Quantity Comparative Subdeletion (CSD) ... (v)

Ho visto più ragazzi di quanto_i abbia visto *t_i* ragazze.

³⁴ Donati (1997) considers this *wh* phrase as an overt operator, showing that the movement in Italian QCC is sensitive to island constraint.

(i) a. *Ho mangiato più biscotti di quanti_i ho incontrato
have-1SG eaten more cookies than WH-PL have-1SG met
un uomo che ne ha mangiati *t_i*
a man who of-them has eaten
‘I ate more cookies than I met a man who ate.’

b. *I ate more biscuits than I met a man who ate [e]’ (Donati 1997, p. 149)

Have-1SG seen more boys than WH-PL have-1SG seen girls

‘I saw more boys than I saw girls’ (Donati 1997, 157)

The predicative version of the quantity CD is possible but using adjective *alto* ‘high’ sounds more natural in Italian (p.c. Roberto Petrosino).

(94) Predicative Quantity CD ... (vi)

a. ?Il numero di persone è di più di quanto non lo fosse prima.

the number of people is of more than as-much NEG cl.m.sg were before

‘The number of people is more than it was before’

b. Il numero di persone è maggiore/più alto di prima.

the number of people is more/more high than before

‘The number of people is more/higher than before’

The degree clausal comparative is, thus, possible in Italian, as shown below. Here the adjective is repeated in the comparative clause since the copula would be elided otherwise and it is difficult to distinguish it from the phrasal counterpart.

(95) Predicative Degree CD ... (vii)

Maria è più alta di quanto Giovanni sia alto.

Mary is more tall-FEM than how John be.SUBJ.3SG tall-MASC

‘Mary is taller than John is tall.’ (Bacskai-Atkari 2014, 119)

Cf.

Raulo è più alto di Alessandro.

Ralph is more tall-MASC than Alexander

‘Ralph is taller than Alexander.’ (Bacskai-Atkari 2014, 47)

The CSD version of the predicative degree clausal comparative is also available, as shown below.

(96) Predicative degree CSD ... (viii)

Questo tavolo è più lungo di quanto questa scrivania sia larga

This table is more long than how this desk is wide

‘This table is longer than that desk is wide’

The attributive degree CSD is degraded in Italian, too as in the case of English, German and French counterparts, while the CD counterpart is grammatical.

(97) Attributive Degree CD ... (ix)

Gianni ha comprato un ombrello più lungo di quello che Maria ha comprato.

Gianni has bought an umbrella more longer than much that Maria has bought

‘John bought a longer umbrella than Maria bought.’

(98) Attributive Degree CSD ... (x)

a. ??Gianni ha comprato un ombrello più lungo di quanto Maria abbia venduto il bastone.

Gianni has bought a umbrella more long than much Maria has sold the stick

‘John bought a longer umbrella than Maria sold the stick’

- b. ??Gianni ha letto un report più lungo di quanto Maria abbia scritto il paper.

Gianni has read a report more long than much Maria has wrote the paper

‘John read a longer report than Maria wrote the paper’

3.3.5. Spanish³⁵

Spanish comparatives look similar to other languages when *than* (*que* in Spanish) is missing or is followed by a phrase.

- (99) Comparatives without than ... (i)

- a. Esta mesa es más alta.

this table is more high

‘This table is higher’ (Degree)

- b. Juan tiene más libros.

Juan has more books

‘Juan has more books’ (Quantity)

- (100) Phrasal Quantity Comparative ... (ii)

- a. Juan compró más libros que diarios. (Accuosto and Wonsever 1997, 1)

Juan bought more books than newspapers

‘Juan bought more books than newspapers’

- b. Come más manzanas que naranjas.

he-eats more apples than oranges

³⁵ The Spanish examples in this section, when not cited, are provided by a consultant, Gabrel Martinez Vera.

‘He eats more apples than oranges.’

(101) Phrasal Degree Comparatives ... (iii)

- a. Pedro es más alto que Juan. (Beck et al. 2009, 55)

Pedro is more tall than Bill

- b. Marta tiene un libro más interesante que Harry Potter.

Martha has a book more interesting than Harry Potter

‘Mary has a more interesting book than Harry Potter.’

Quantity clausal comparatives (both CD and CSD) are allowed in Spanish, as shown below. Here the *de lo* ‘of the’ is optionally inserted at the end of the main clause (some speakers prefer to have them inserted).

(102) Attributive Quantity Comparative Deletion (CD) ... (iv)

- a. Maria compró más paraguas que Juan. (Beck et al. 2009, 55)

Maria bought much.COMP umbrellas than Juan

‘Maria bought more umbrellas than Juan.’

- b. Juan comió más manzanas de las que había traído. (Knowles 1984, 5)

Juan ate more apples of the than had bought

‘Juan ate more apples than he had bought.’

(103) Attributive Quantity Comparative Subdeletion (CSD) ... (v)

- a. Juan compró más libros (de lo) que Pedro vendió revistas.

John bought more books of the than Peter sold magazines

‘John bought more books than Peter sold magazines’

b. María lee más libros que Juan lee revistas.³⁶

Mary reads more books that John reads magazines

‘Mary reads more books than John reads magazines’

The predicative counterpart of quantity CD is expressed in a different way in pattern with the other Romance languages, with an adjective *mayor* ‘greater’.

(104) El número de gente es mayor que antes/de lo que era antes.

the number of people is greater than before/of the that was before

‘The number of people is more than it was ____ before.’

(105) Predicative degree CD ... (vii)

Un perro es más feroz (de lo) que puede ser un gato (Price 1990, 27)

A dog is more fierce of the than can be a cat

‘A dog is more fierce than a cat may be.’

In the degree CSD in Spanish, the overt adjective has to be fronted in the subordinate clause as shown below.

³⁶ This predicative quantity CSD is acceptable for my consultant Gabriel Vera. Previous literature considers it to be somewhat degraded (Snyder 1995, p. 119); this might be due to a European vs. Latin American Spanish difference.

(106) Predicative degree CSD ... (viii)

La mesa es más alta que **ancha** es la puerta. (Price 1990, 40; Beck et al. 2009, 56)

The table is more high than wide is the door

‘The table is higher than the door is wide.’

The exact nature of this fronting of adjectives in degree CSD is not clear, but it is used in some other contexts in Spanish as well, e.g. topicalization or contrastive focus.

(107) a. Alto no es Juan.

tall no is John.

‘John is **not** tall.’

b. Rica está la comida.

tasty is the food

‘The food is **tasty**.’

As in the case of the other languages shown so far, the CD version of the attributive degree comparative is grammatical while the CSD counterpart is not acceptable in Spanish either.

(108) Attributive degree CD ... (ix)

a. Marta tiene un coche más rápido que Juan. (Beck et al. 2009, 55)

Marta has a car much.COMP fast than Juan

‘Marta has a faster car than Juan.’

b. Marta tiene un coche más rápido que el que Juan solía tener.

Marta has a car more fast than the taht Juan used-to have

‘Marta has a faster car than Juan used to have’

(109) Attributive degree CSD ... (x)

a. *Juan compró un bastón más largo que María vendió un paraguas.

J bought a cane more long than M sold a umbrella

‘*Juan bought a longer cane than Marta sold an umbrella.’

b. *Juan leyó un reporte más largo que María escribió un artículo.

Juan read a report more long than Maria wrote a paper

‘?Juan read a longer report than Maria wrote a paper.’

3.3.6. Bulgarian³⁷

The comparatives without *than* (*ot/otkolkoto*) and phrasal comparatives with *than* in Bulgarian are shown below.

(110) Comparatives without *than* ... (i)

a. Tazi masa e po-visoka.

this.fem table.fem is.pres more-high.fem

‘This table is higher’

b. Ivan ima poveche knigi.

Ivan has more books

‘John has more books’

³⁷ The Bulgarian sentences (when no citation is given) in this section are provided by Vesela Simeonova.

(111) Phrasal Quantity Comparative ... (ii)

Maria ima poveche knigi, otkolkoto spisanija.

Maria has more books than magazines

‘Mary has more books than magazines’

(112) Phrasal Degree Comparative ... (iii)

a. Росен е по-висок от Таня.

Rosen is COMP-tall.masc from Tanya

‘Rosen is taller than Tanya.’ (Beck et al. 2009, 35)

b. Maria ima po-interesna kniga ot Harry Potter

Maria has more-interesting.fem book.fem than HP

‘Mary has a more interesting book than Harry Potter.’

The quantity clausal comparatives are available in Bulgarian as attributive CD/CSD and the predicative CD, as shown below.

(113) Attributive quantity Comparative Deletion (CD) ... (iv)

a. Ivan izpi poveče vino ot-kolkoto³⁸ bjahme kupili. (Izvorski 1995, 8)

³⁸ Bulgarian has a *wh* element appearing in its clausal comparatives, where “колкото” in “от-колкото” corresponds to a *wh*-word “how much”, as shown in Beck et al.’s (2009) example.

(i) Етажерката е по-широка, отколкото е висока вратата.
shelf is COMP-wide.fem from_how_much.def is high.fem door.def
‘The shelf is wider than the door is high’

In Bulgarian, this type of overt *wh* element is considered to be part of the formation of a free relative (Izvorski 1995), which appears in *of*-comparatives and QCC in addition to the DCC. I treat these *wh*-elements as obligatory overt relative pronoun in languages like Hungarian or Bulgarian for the formation of clausal comparatives.

Ivan drank more wine from-how-much-REL were-1pl bought

‘Ivan drank more wine than we had bought.’

b. Ivan izpi poveče ot vinoto ot-kolkoto Maria ot birata.

Ivan drank more from the-wine from-how-much-REL Maria from the-beer

‘Ivan drank more of the wine than Maria drank of the beer.’ (Izvorski 1995, 8)

(114) Attributive quantity Comparative SubDeletion (CSD) ... (v)

Ivan izpi poveče vino ot-kolkoto Maria bira. (Izvorski 1995, 8)

Ivan drank more wine from-how-much-REL Maria beer

‘Ivan drank more wine than Maria drank beer.’

(115) Predicative Quantity CD ... (vi)

Horata sa poveche ot /otkolkoto kogato i da bilo³⁹

people.def are more than when.relative and subj. be.past

‘People are more than they were’

Degree clausal comparatives with adjectives in the predicative positions are reported to be possible (by Beck et al. 2009), as shown below, though the CSD version is somewhat degraded.

Note that Serbo Croatian (SC) allows (i) with *koliko* ‘how-much’, but without a comparative, i.e. it indicates equality, as the English translation in (ii) shows.

- (ii) Polika je široka koliko su vrata visoka.
shelf is wide how-much are door high
‘The shelf is as wide as the door is high.’

The sentence is not allowed when a comparative form of the adjective *šira* ‘wider’ is used, as shown in (iii).

- (iii) *Polika je šira koliko su vrata visoka.
shelf is wider how-much are door high
‘The shelf is wider than the door is high.’

³⁹ *kogato i da bilo* is a fixed construction that roughly means "ever" in Bulgarian.

(116) Predicative degree CD ... (vii)

Росен е по-висок, отколкото беше Тания на същата възраст.

Rosen is COMP-tall.masc from_how_much.def was Tanya at same.def age

‘Rosen is taller than Tanya was at the same age.’ (Beck et al. 2009, 35)

(117) Predicative degree CSD ... (viii)

?Етажерката е по-широка, отколкото е висока вратата.

shelf is COMP-wide.fem from_how_much.def is high.fem door.def

‘The shelf is wider than the door is high’ (Beck et al. 2009, 36)

Finally, Bulgarian shows the same pattern as other languages we have seen so far in that it allows degree CD but not degree CSD when the adjective is attributive.

(118) Attributive degree CD ... (ix)

a. Мария купи по-скъпа книга отколкото Тания.

Rosen bought COMP-expensive.fem book.fem from_how_much.def Tanya

‘Maria bought a more expensive book than Tanya.’ (Beck et al. 2009, 35)

b. Az imam po-goljam apartamen otkolkoto ti imaš.

I have bigger apartment than+how.much you have

‘I have a bigger apartment than you have.’ (Kennedy and Merchant 2000, 109)

(119) Attributive degree CSD ... (x)

a. *Az imam po-goljam apartamen otkolkoto ti imaš kušta.

I have bigger apartment than+how.much you have house

‘lit. *I have a bigger apartment than you have a house.’

(Kennedy and Mercant 2000, 107)

b. *Ivan napisa po-dobar roman otkokoto Saša napisa drama.

Ivan wrote better novel than+how.much Sasha wrote play

‘lit. *Ivan wrote a more successful novel than Sasha wrote a play.’

c. * Ivan kupi po-dulug chadur otkolkoto Maria prodade bastun.

Ivan bought po-long.masc umbrella.masc than Maria sold cane

‘Lit: Ivan bought a longer umbrella than Maria sold a cane.’

3.3.7. Hungarian⁴⁰

The *than*-phrase (*mint*-phrase in Hungarian) can be missing in comparatives in Hungarian as well, as shown below.

(120) Comparatives without *than* ... (i)

a. Ez az asztal magas-abb.

this the table big-cmpr

‘This table is higher.’ (Degree)

b. János-nak több könyv-e van⁴¹.

⁴⁰ All the Hungarian data (except for the ones with the citation) in this subsection are from my consultant, Éva Dékány.

⁴¹ Here, the possession in Hungarian is expressed as a predicative structure, with a dative Case marker on the possessor and a “poss” marking on the possessee.

(i) a. Péter-nek sok könyv-e van.

P-dat many book-poss be.3sg

J-dat more book-poss be.3sg.

‘John has more books.’ (Quantity)

Hungarian phrasal comparatives can be expressed⁴² in the following way with *mint* ‘than’.

(121) Phrasal Quantity Comparative ...(ii)

Mari-nak több könyv-e van mint magazin-ja.

M-dat more book-poss be.3sg than magazine-poss

‘Mary has more books than magazines.’

(122) Phrasal Degree Comparative ...(iii)

a. Mari magasabb, mint Peti. (Bacskai-Atkari 2014, 10)

Mary taller than Peter

‘Mary is taller than Peter.’

b. Mari-nak van egy a H P-nél érdekes-ebb könyv-e.

M-dat be.3sg one the H P-addhesive interesting-cmpr book-poss

‘Mary has a more interesting book than Harry Potter.’

‘P has many books’

b. Péter-nek van könyv-e.
P-dat be.3sg book-poss
‘P has a book/books.’

⁴² Alternatively, the phrasal comparatives in Hungarian can be expressed without *mint* ‘than’, but with the compared phrase appearing marked by an addessive (ADE) Case.

(i) a. Lujza magasabb volt Marinál. (Bacskai-Atkari 2014, 47)

Louise taller was.3SG Mary-ADE
‘Louise was taller than Mary.’

b. Mari-nak van egy a H P-nél érdekes-ebb könyv-e.
M-dat be.3sg one the H P-addhesive interesting-cmpr book-poss
‘Mary has a more interesting book than Harry Potter.’

The attributive quantity clausal comparatives are grammatical as CDs (Bacskai-Atkari 2014), and CSDs (Snyder 1995).

(123) Attributive Quantity Comparative Deletion (CD) ... (iv)

a. Marinak több macskája van, mint ahány macskája Petinek van.

Mary-DAT more cat-POSS.3SG is than how-many cat-POSS.3SG Peter-DAT is

‘Mary has more cats than Peter has.’ (Bacskai-Atkari 2014, 9)

b. ?Mari több macskát vett, mint Péter látott.

Mary more cat-ACC bought.3SG than Peter saw.3SG

‘Mary bought more cats than Peter saw.’

(124) Attributive Quantity Comparative SubDeletion (CSD) ... (v)

János több könyvet olvasott mint [Maria újságot]. (Snyder 1995, 118)

John more book-ACC read than Mary newspaper-ACC

‘John read more books than Mary (read) newspapers.’

The predicative quantity CD is translated in the following way. Here the adjective nagy ‘big’ is used and the sentence is thus a degree comparative.

(125) Az külföldi vendég-ek szám-a **nagy**-obb, mint korábban.

The foreigner guest-pl number-poss big-cmpr than earlier

‘The number of foreign guests is bigger than before.’

Cf. The number of foreign guests is more than it was before.

The degree CD with the predicative adjective is possible in Hungarian, as shown below. When the adjective is overt (i.e. repeated in the comparative clause), *wh* operator must be used, which has two versions, i.e. *amilyen* and *amennyire* (Bacskai-Atkari 2014). The adjective has to move with *amilyen* ‘how’ but not with *amennyire* ‘how much.’ The adjective can also be covert as in (126c).

(126) Predicative degree CD ... (vii)

a. Mari magasabb, mint amennyire Peti magas. (Bacskai-Atkari 2014, 9)

Mary taller than how.much Peter tall

‘Mary is taller than Peter is tall.’

b. Mari magasabb, mint amilyen magas Peti.

Mary taller than how tall Peter

‘Mary is taller than Peter is tall.’

c. Mari magasabb, mint Péter volt. (Bacskai-Atkari and Kántor 2012, 55, 28a)

Mary taller than Peter was.3SG

‘Mary is taller than Peter was.’

The CSD version, in which the adjective is always overt, follows the same pattern, as shown below.

(127) Predicative degree CSD⁴³ ... (viii)

⁴³ Snyder (1995) observes that Hungarian does not allow subcomparatives when degree is compared.

(i) *János jobbkepű mint [Maria szép]. (Snyder 1995, 133)

John better-looking than Mary pretty

‘John is better-looking than Mary is pretty.’

- a. A kés hosszabb, mint amilyen mély a fiók.

The knife long.COMP than how deep the drawer

‘The knife is longer than the drawer is deep.’ (Beck et al. 2009, 42)

- b. A kés hosszabb, mint amennyire a fiók mély.

The knife long.COMP than how.much the drawer deep

‘The knife is longer than the drawer is deep.’

The attributive version of the degree clausal comparatives in Hungarian is allowed as a CD with either *amilyen* and *amennyire*.

(128) Attributive degree CD ... (ix)

- a. Marinak nagyobb macskája van, mint amilyen nagy macskája Petinek van.

Mary-DAT bigger cat-POSS.3SG is than how big cat-POSS.3SG Peter-DAT is

‘Mary has a bigger cat than Peter has.’ (Bacskai-Atkari 2014, 9)

- b. ? Mari nagyobb macskát vett, mint Péter látott.

Mary bigger cat-ACC bought.3SG than Peter saw.3SG

‘Mary bought a bigger cat than Peter saw.’ (Bacskai-Atkari 2014, 254)

The CSD counterparts of the sentences are shown below. Here the attributive degree CSD with *amilyen*, where the adjective and the modified DP are fronted in the comparative clause, is grammatical, as in (129a). On the other hand, the sentence with the *amennyire*, where the adjective

However, this is because the overt *wh* operators are not used here despite the adjective being overt in the comparative clause, i.e. it may be that an overt adjective requires an overt *wh* operator.

and the DP stay in the base-position, is ungrammatical as in (129b). There is a clear contrast between this CSD and the CD counterpart (p.c. Éva Dékány).

(129) Attributive degree CSD ... (x)

a. Rudolf nagyobb macskát vett, mint **amilyen** [széles macskaajtót] Miklós vett.

Rudolph bigger cat-ACC bought.3SG than how wide cat flap-ACC Mike bought.3SG

‘Rudolph bought a bigger cat than Mike bought a wide cat flap.’

(Bacskai-Atkari 2014, 282)

b. *Rudolf nagyobb macskát vett, mint **amennyire** Miklós vett

Rudolph bigger cat-ACC bought.3SG than how.much Mike bought.3SG

[széles macskaajtót].

wide cat flap-ACC

‘Rudolph bought a bigger cat than Mike bought a cat flap.’

I consider the latter sentence with the *amennyire* to be a more appropriate Hungarian counterpart of the attributive CSD sentence, since crucially the modified nominal did not move along with the operator (either null or overt) in the counterparts in other languages including English. Thus, I conclude here that Hungarian patterns with the other languages above in that the attributive degree CD is grammatical while the attributive degree CSD is ungrammatical.

So far, the languages we saw basically followed the same pattern as English, i.e. the Phrasal or the Clausal comparatives are generally possible except for the Attributive Degree CSD. Now we are turning to languages that show different patterns.

3.3.8. Japanese

Japanese comparatives are grammatical without *yori* ‘than’ phrase/clause, although *motto* ‘more’ has to precede the adjectives or *takusan* ‘many’, as shown below. Japanese adjectives do not have a comparative morphology corresponding to *-er* in English.

(130) Comparatives without *than* ... (i)

- a. kono teeburu -wa motto takai

this table -Top more high

‘This table is high’ (Degree)

- b. John -wa motto takusan -no hon -o mot-teiru

John -Top more many -Gen book -Acc have-Asp

‘John has more books’ (Quantity)

As I mentioned earlier, phrasal comparatives in Japanese are allowed with degree-comparisons as well as quantity-comparisons. Here, *takusan* ‘many’ in the main clauses can be either an attributive quantifier (with the genitive Case marker) or a floating quantifier.

(131) Phrasal Quantity Comparatives ... (ii)

- a. Mary -wa John yori takusan -no ronbun -o kaita.

Mary -Top than many -Gen paper -Acc wrote

‘Mary wrote more papers than John.’ (Beck et al. 2004, 289)

- b. Mary -wa zassi yori hon -o takusan motteiru.

Mary -Top magazine than book -Acc many have

‘Mary has more books than magazines.’

(132) Phrasal Degree Comparatives ... (iii)

- a. Kono tsukue –wa ano teeburu yori nagai

this desk -Top that table than long

‘This desk is longer than that table.’

- b. Mary –wa “Harry potter” yori omosiroi hon –o motteiru.

-Top than interesting book –Acc have

‘Mary has a more interesting book than Harry Potter.’

As mentioned earlier, clausal comparatives in Japanese are possible only when the comparison is between quantities. Thus, the attributive quantity CD/CSD is grammatical.

(133) Attributive Quantity Comparative Deletion (CD) ... (iv)

- a. Taroo-wa [Hanako-ga katta yori (mo)] takusan (-no) kasa-o katta

Taroo-Top [Hanako-Nom bought YORI (mo)] many (-Gen) umbrella-Acc bought

‘Taroo bought more umbrellas than Hanako did/bought.’ (Beck et al. 2004, 290)

- b. Mary-wa [John-ga kaita yori] (motto) takusan-no ronbun-o kaita

Mary-Top John-Nom wrote than] (more) many-Gen paper-Acc wrote

‘Mary wrote more papers than John did.’ (Beck et al. 2004, 289)

(134) Attributive Quantity Comparative SubDeletion (CSD) ... (v)

John –wa Bill -ga hon –o motteiru yori takusan zassi –o motteiru

-Top -Nom book –Acc have-Asp than many magazine –Acc have

‘John has more books than Bill has ____ magazines.’ (Izvorski 2000, 95)

It is not clear if the predicative quantity clausal comparative is possible in Japanese since they have to be expressed in the following way as a phrasal comparative, where *izen* ‘before’ is a noun.

(135) hito -ga izen yori ooi
 people –Nom before than many
 ‘people are a lot more than before’

The predicative degree CD is clearly degraded, compared to the quantity clausal comparatives. The CSD counterpart of the sentence is also completely ungrammatical in Japanese, as reported in the previous literature (e.g. Beck et al. 2004).

(136) Predicative Degree CD ... (vii)
 *Mary -wa Jane -ga kawaii yori kawaii.⁴⁴
 -Top -Nom pretty than pretty
 ‘Mary is prettier than Jane is.’

(137) Predicative Degree CSD ... (viii)

*Kono tana-wa ano doa -ga hiroi yori takai

⁴⁴ The adjective is repeated in the subordinate clause, otherwise the sentence becomes a phrasal comparative.
 (i) Mary –wa Jane(*-ga) yori kawaii.
 Mary –Top Jane –Nom than pretty
 ‘Mary is prettier than Jane.’

This table-Top that door –Nom wide than tall

'This shelf is taller than that door is wide'

The attributive versions of degree CD and CSD are also ungrammatical in Japanese. Crucially there is no contrast in grammaticality between the two, unlike the other languages we saw above, where the predicative degree CD was better than the CSD counterpart.

(138) Attributive degree CD ... (ix)

?*Taro-wa Hanako-ga katta yori nagai kasa-o katta
-Top -Nom bought than long umbrella-Acc bought

'Taroo bought a longer umbrella than Hanako bought.' (Ishii 1991, 130)

(139) Attributive degree CSD ... (x)

?*Taro-wa Hanako-ga kasa-o katta yori nagai tue-o katta
-Top -Nom umbrella-Acc bought than long cane-Acc bought

'*Taroo bought a longer stick than Hanako bought an umbrella.' (Ishii 1991, 142)

3.3.9. Polish⁴⁵

Polish has two *thans*, *od* and *niż*. The former is used in a phrasal comparative and the latter in a clausal comparative. Comparatives without *od* or *niż* are also possible as shown below.

(140) Comparatives without *than* ... (i)

⁴⁵ Polish sentences (where no citation is given) are provided by a consultant, Marcin Dadan.

a. Ten stół jest wyższy.

this table is higher

‘This table is higher.’

b. Jan ma więcej książek.

John has more books

‘Jan has more books.’

The phrasal comparatives in Polish are shown below, where both the quantity- and degree-comparison are possible.

(141) Phrasal Quantity Comparative ... (ii)

Jan wypił więcej piwa od wina.

Jan-Nom drank more beer-Gen from wine-Gen

‘Jan drank more beer than wine.’ (Borsley 1989, 129)

(142) Phrasal Degree Comparative ... (iii)

a. Anna jest wyższa od Agnieszki⁴⁶

Anna is taller from Agnieszka.Gen

‘Anna is taller than Agnieszka.’ (Pancheva 2006, 9)

b. Maria ma bardziej ciekawą książkę od Harry Pottera.

⁴⁶ When the NP complement here appears in nominative, *niż* instead of *od* must be used. This suggests that the comparative clause is elided in this version, since *niż* is usually used for a clausal complement.

(i) Anna jest wyższa niż Agnieszka
Anna is taller than Agnieszka.Nom
‘Anna is taller than Agnieszka is.’

M has more interesting book from Harry Potter.Gen

‘Maria has more interesting book than Harry Potter.’

c. Maria ma ciekwsza ksiazke od Biblii.

Maria has interesting.Com book.Acc from Bible.Acc

‘Maria has more interesting book than Bible.’

The quantity clausal comparatives are possible in Polish as CD or CSD, where *niż* ‘than’ introduces the comparative clause.

(143) Attributive Quantity Comparative Deletion (CD) ... (iv)

a. Marek zwiedził więcej miejsc niż Anna.

Marek visited more places than Anna-NOM

‘Marek visited more places than Anna did.’ (Pancheva and Tomaszewicz 2011, 185)

b. Maria napisała więcej książek niż Bill przeczytał.

Mary wrote more books than Bill read

‘Mary wrote more books than Bill read.’

(144) Attributive quantity Comparative SubDeletion (CSD) ... (v)

Maria napisała więcej artykułów niż Bill przeczytał książek.

Mary wrote more papers than Bill read books

‘Mary wrote more papers than Bill read books.’

As in the case of German, French, Spanish or Hungarian, the predicative version of quantity CD is most naturally expressed using an adjective (*większa* ‘larger’); however, the sentence is not perfectly grammatical.

(145) ?Liczba ludzi jest większa niż była poprzednio.

Number people is larger than was previously

‘The number of people is more than it was ____ before.’

Now, in contrast with the quantity clausal comparatives, the degree-comparison is not acceptable when a clausal complement follows the *niż* ‘than’ (Bacskai-Atkari 2014).

(146) Predicative degree CD ... (vii)

a. * Maria jest wyższa niż Karol jest wysoki.

Mary is taller than Charles is tall

‘Mary is taller than Charles is.’ (Bacskai-Atkari 2014, 2)

b. ??Maria jest wyższa niż Karol jest

Mary is taller than Charles is

(147) Predicative degree CSD ... (viii)

*/??? Stół jest dłuższy niż biuro jest szerokie.

desk is longer than office is wide

‘The desk is longer than the office is wide.’ (Bacskai-Atkari 2014, 2)

This is the familiar pattern seen in Japanese (see e.g. Ishii 1991), where the DCC is disallowed while the QCC is allowed. When the adjective is attributive, Polish follows Japanese again in that both the degree CD and the CSD are degraded compared to quantity counterparts⁴⁷.

(148) Attributive degree CD ... (ix)

a. ?? Jan kupił droższy samochód, niż Paweł sprzedał

Jan bought more expensive car than Paweł sold.

‘intention: the car Jan bought is more expensive than the one Paweł sold’

b. ?? Jan kupił dłuższą parasolkę niż Paweł sprzedał

Jan bought longer umbrella than Paweł sold

‘Jan bought a longer umbrella than Paweł sold.’

(149) Attributive degree CSD ... (x)

a. ?? Jan napisał dłuższy list, niż Paweł napisał sztukę.

J wrote longer letter than P wrote play

‘Jan wrote a longer letter than Paweł wrote a play.’

b. ?? Jan kupił droższy samochód, niż Paweł kupił motocykl.

J bought more.expensive car than P bought motorcycle

‘Jan bought a more expensive car than Paweł bought a motorcycle.’

(Kennedy and Merchant 2000, 104-105)

c. ?? Jan kupił dłuższą laskę niż Paweł sprzedał parasolkę.

Jan bought longer cane than Paweł sold umbrella.

⁴⁷ The judgement is checked with my consultant, compared to other clausal comparatives above, although my consultant thinks that the Attributive degree CDs are slightly better than the CSD versions.

‘Jan bought a longer cane than Pawel sold an umbrella.’

The sentences are perfectly grammatical when relativized as in (150). The sentence is a degree phrasal comparative this way.

(150) Samochód, który Jan kupił był droższy, niż motocykl, który Paweł sprzedał.

Car which Jon bought was more-expensive than a bike which P sold

‘The car that Jon sold was more expensive than a bike than Paweł sold.’

In sum, Polish patterns with Japanese in that clausal comparatives are allowed when quantity is compared but not allowed when it is a degree-comparison. There are other languages which show a similar pattern, as shown below.

3.3.10. Serbo Croatian⁴⁸

Serbo-Croatian (SC) also has two types of *than*; *od* and *nego*, where only *nego* can take a clausal complement. The *od/nego* are not obligatory in comparatives, as shown below.

(151) Comparatives without *than* ... (i)

a. Ovaj sto je viši.

this.nom.sg.m table.nom.sg.m is higher

‘This table is higher’

b. Ivan ima više knjiga.

⁴⁸ The grammaticality of the SC sentences is checked by two consultants, Aida Talić and Ivana Jovović.

Ivan.nom.sg.m has more book.gen.pl.f

‘John has more books’

Phrasal comparatives are possible for both quantity- and degree-comparison as shown below.

(152) Phrasal Quantity Comparative ... (ii)

Marija ima više knjiga nego časopisa.

Marija.nom.f has more book.gen.pl.f than magazine.gen.pl.m

‘Mary has more books than magazines’

(153) Phrasal Degree Comparative ... (iii)

a. Marija je viša od Borisa.

Marija.nom.f is taller.nom.sg.f than Boris.gen.m

‘Mary is taller than Bill’

b. Marija ima interesantn-iju knjigu od Hari Potera.

Marija.nom.f has interesting-comp.acc.sg.f book.acc.sg.f than Harry Potter.gen.m

‘Mary has a more interesting book than Harry Potter.’

Turning to clausal comparatives, attributive quantity CD or CSD is allowed in SC⁴⁹.

(154) Attributive Quantity Comparative Deletion (CD) ... (iv)

Marija je napisala više članaka nego što je

⁴⁹ Here, *nego* ‘than’ in the clausal comparatives is followed by a complementizer *što* in SC clausal comparatives.

Marija.nom.f is written.sg.f more article.gen.pl.m than that is
Ivan pročitao.

Ivan.nom.m read.participle.sg.m

‘Mary wrote more papers than Ivan read.’

(155) Attributive Quantity Comparative SubDeletion (CSD) ... (v)

a. Mary je procitala više knjiga nego što je John novina. (Snyder 1995, 119)

Mary is read more books.Gen than that is John newspaper.Gen

‘Mary read more books than John (read) newspapers.’

b. Ivan ima više knjiga nego što Boris ima časopisa.

Ivan.nom.m has more book.gen.pl.f than that Boris.nom.m has magazine.gen.pl.m

The predicative version of quantity CD is most naturally translated as follows, where the adjectives *veći* ‘bigger’ or *viši* ‘higher’ are used.

(156) Broj ljudi (na planeti) je veći/viši⁵⁰

number.nom.sg.m people.gen.pl.m (on planet) is bigger.nom.sg.m/higher.nom.sg.m

nego što je bio ranije.

than that is been.sg.m earlier

‘The number of people is higher than it was ____ before’

⁵⁰ The sentence here is a predicative degree CD, but sounds better than the other degree CDs. This is presumably because there is an additional dimension of comparison, i.e. now and before, added to the sentence.

The judgements for the degree clausal comparatives are not very clear and there is often disagreement between the consultants. Generally though, the predicative degree CD is not grammatical in SC.

(157) Predicative Degree CD ... (vii)

- a. *Marija je brža nego što je Jelena.

Marija.nom.f is faster.nom.sg.f than what/that is Jelena.nom.f

‘Maria is faster than Jelena is’

- b. ?* Sto je širi nego što je soba.

table is wider than what is room

‘The table is wider than the room is.’

Now the CSD versions of the predicative degree clausal comparatives are better than their CD counterparts in this language though they are not completely grammatical⁵¹, in contrast with the quantity clausal comparatives.

(158) Predicative degree CSD ... (viii)

- a. ?Vrata su viša nego što je prozor širok.

Doors (Pluralia tantum) are higher than what is window wide

‘The door is taller than the window is wide.’ (Snyder 1995, 133)

- b. ?? Ovaj sto je duži nego što su ta

This.nom.sg.m table.nom.sg.m is longer.nom.sg.m than what are those.nom.pl

⁵¹ The judgement by Ivana Jovović.

vrata široka.

door.nom.pl wide.nom.pl.SHORT.FORM

‘This table is longer than that door is wide.’

Lastly the attributive degree clausal comparatives are not completely grammatical in SC, either.

(159) Attributive degree CD ... (ix)

??Ivan je kupio duži kišobran nego

Ivan.nom is bought.sg.m longer.acc.sg.m umbrella.acc.sg.m than

što je Marija prodala.

what is Marija.nom sold.sg.f

‘Ivan bought a longer umbrella than Mary sold.’

(160) Attributive degree CSD ... (x)

a. ??/*Ivan je kupio duži kišobran nego što je

Ivan.nom is bought.sg.m longer.acc.sg.m umbrella.acc.sg.m than what is

Marija prodala štap.

Marija.nom sold cane.acc.sg.m

‘Ivan bought a longer umbrella than Maria sold a cane.’

One of the consultants prefers the CD over CSD while the other one preferred the CSD to the CD.

They agreed, however, that (160) becomes grammatical when the comparative clause is relativized,

i.e. the sentence becomes a phrasal comparative:

(161) Ivan je kupio kisobran koji je duži od stapa sto je Marija prodala.

Ivan is bought umbrella which is longer than cane which is Marija sold

‘Ivan bought an umbrella which is longer than [[the cane] Maria sold].’

3.3.11. Slovenian⁵²

Comparative complement in Slovenian can be headed either by the conjunction *kot*, or by the preposition *od* (Živanović 2010). The comparatives without *than* elements are also possible, as in the other languages we have seen so far.

(162) Comparatives without *than* ... (i)

a. Ta miza je višja.

this.F table.F AUX.3 higher.F

‘This table is higher’

b. Janez je kupil več knjig.

Janez AUX.3 bought.M more books.GEN

‘Janez bought more books.’

The literature suggests that the phrasal comparatives are available for both quantity- and degree-comparison as shown below.

(163) Phrasal Quantity Comparative ... (ii)

⁵² My consultant Adrian Stegovec provided the Slovenian sentences in this subsection (except for the ones cited).

- a. Pismo so poslali več(im) politikom kot poslovnežem.
 letter be send more politician than businessman
 acc.f.sg. 3.pl. ptc.m.pl.g. (dat.pl.) ptc.3.n.sg. conj. dat.m.pl.
 ‘They sent the letter to more politicians than businessmen.’ (Živanović 2010, 230)
- b. Marija je kupila več knjig kot revij.
 Marija AUX.3 bought.F more books.GEN as magazines.GEN
 ‘Mary bought more books than magazines.’

(164) Phrasal Degree Comparative ... (iii)

- a. Janko je starejši kot/od Metka.
 J be older than M
 nom.m.sg. 3.sg. nom.m.sg. conj./prep. nom.f.sg. (Živanović 2010, 225)
 ‘Janko is older than Metka.’
- b. Sašo je boljši študent od Mirkota.
 S.Nom.Sg.Masc is better.Nom.Sg.Masc student.Nom.Sg.Masc. from M.Gen.Sg.Masc.
 ‘Saso is a better student than Mirko.’ (Chidambaram 2013, 144)

Turning to the clausal comparatives, the quantity clausal comparatives are allowed in Slovenian either as CD or CSD.

(165) Attributive Quantity Comparative Deletion (CD) ... (iv)

- a. huligani so več flaš razbili kot popili.
 hooligan be more bottle break than drink

nom.m.pl. 3.pl. gen.f.sg. ptc.m.pl. conj. ptc.m.pl.

‘The hooligans broke more bottles than they drank.’ (Živanović 2010, 230)

b. Marija je napisala več člankov kot jih je Boris prebral.

Marija AUX.3 wrote.F more articles.GEN than them.GEN AUX.3 Boris read.M

Mary wrote more books than Bill read.

(166) Attributive Quantity Comparative SubDeletion (CSD) ...(v)

Marija je napisala več člankov kot je Boris prebral knjig.

Marija AUX.3 wrote.F more articles.GEN than AUX.3 Boris read.M books.GEN

‘Mary wrote more papers than Boris read books.’

(167) Predicative Quantity CD ...(vi)

a. Število ljudi je večje kot prej.

number.N people.M.GEN AUX.3 more.er than before

‘The number of people is more than it was ____ before.’

b. Število ljudi je večje kot je bilo prej.

number.N people.M.GEN AUX.3 more.er than AUX.3 been.N before

‘The number of people is more than it was ____ before.’ e.’

c. Število ljudi je večje kot je bilo kdarkoli prej.

Number.N people AUX.3 more.er than AUX.3 been.N whenever before.

‘The number of people is more than it ever was before.’

The degree version of the CD or CSD, on the other hand, are clearly degraded compared to the quantity counterparts, as shown below. This is again parallel with Japanese.

(168) Predicative degree CD ... (vii)

*Janez je višji kot je Marija.

John aux taller than aux Mary

‘John is taller than Mary is’

(169) Predicative degree CSD ... (viii)

??Ta miza je dališa kot je ta pisalna miza široka

This table be.3sg longer than be this desk wide

‘This table is longer than this desk is wide.’

The attributive degree CD/CSD is also ungrammatical in Slovenian as shown below. These sentences are worse than the predicative counterparts according to my consultant.

(170) Attributive degree CD ... (ix)

a. *Sašo je boljši študent kot je Mirko dober študent.

Saš_{NOM.SG.MASC.} is better_{NOM.SG.MASC.} student_{NOM.PL.MASC.} than is Mirko_{NOM.SG.MASC.}

‘Sašo is a better student than Mirko (is).’ (Chidambaram 2013, 157)

b. *Janez je kupil daljši dežnik kot je Marija prodala.

Janez AUX.3 bought.M.ACC longer.M.ACC umbrella.M than AUX.3 Marija sold.F

‘John bought a longer umbrella than Mary sold it.’

(171) Attributive degree CSD

...(x)

*Janez je kupil daljši dežnik kot je Marija prodala palico.

Janez AUX.3 bought.M longer.M.ACC umbrella.M.ACC as AUX.3 marija sold.F stick.F

‘John bought a longer umbrella than Mary sold a cane.’

There is no contrast between the CD and the CSD here, unlike the other group of languages including English, German, French, Italian, Spanish or Bulgarian.

3.3.12. Russian⁵³

Russian is another language which patterns with Japanese in that it allows quantity clausal comparatives, but no degree clausal comparatives. The *than* element in Russian, *chem* ‘than’⁵⁴ is not obligatory and it can take a phrasal complement both for quantity- and degree-comparison, as shown below.

(172) Comparatives without *than*

...(i)

a. Etot stol vyshe (Degree)

this table high.comp

⁵³ Russian examples in this subsection (where no citation is given) are provided by my consultants, Ksenia Bogomolets and Pavel Koval.

⁵⁴ In Russian, there are two ways of expressing the standard of comparison:

(i) Katya byla vyshe chem Masha.

Katya be_{PAST} tall_{COMP} than Masha_{NOM}.

‘Katya was taller than Masha.’

(ii) Katya byla vyshe Mashi.

Katya be_{PAST} tall_{COMP} Masha_{GEN}.

‘Katya was taller than Masha.’

(Berezovskaya 2013, 38)

Here, I take only the version with the comparative preposition *chem* ‘than’ into consideration for the analysis.

‘This table is higher’

b. Vanja kup'il bol'she knig (Quantity)

V.sg.nom buy.past.pfv.sg.masc more(big.sh.comp.) book.pl.gen

‘John bought more books’

(173) Phrasal Quantity comparative ...(ii)

Masha kupila bol'she knig chem zhurnalov

M.sg.nom buy.past.pfv.sg.fem more book.pl.gen than journal.pl.gen

‘Mary bought more books than magazines’

(174) Phrasal Degree comparative⁵⁵ ...(iii)

Masha kupila bol'eje interesnuju knigu chem Gari Potter.

M. buy.pst.pfv.fem more interesting.fem.sg.acc book.fem.sg.acc than H.P.sg.nom

‘Mary bought a more interesting book than Harry Potter.’

Quantity clausal comparatives in Russian are grammatical when they are either predicative CD/CSD or attributive CD.

⁵⁵ When the subject element is compared, the sentence is ambiguous between phrasal and clausal as the standard of comparison has to be marked as nominative and the copula is null, as shown below.

(i) Masha vyshe chem Petja
M.sg.nom high.comp than P.sg.nom
‘Masha is taller than Peter.’

The nominative Case on the phrasal complement could be taken to indicate that *chem* takes a reduced clausal complement, not a phrasal one. Similar to the German case, however, I treat these comparatives where *than* is followed by a single nominal element as “phrasal comparatives,” where I assume no Op movement is involved. At any rate, what is going to be crucial for our analysis is that while examples like (i) are allowed in Russian, the unambiguously clausal comparatives (178-181) are not allowed when degrees of adjectives are compared.

(175) Attributive Quantity Comparative Deletion (CD) ... (iv)

Masha kupila bol'she knig chem Oleg (prodal)

M. buy.pst more books than O. sell.past.pfv.sg.masc

Mary bought more books than Bill (sold) books.

(176) Attributive Quantity Comparative SubDeletion (CSD) ... (v)

Ivan kupil bolshe knig chem Masha prodala zhurnalov.

John_{NOM} bought more books_{GEN} than Mary sold magazines_{GEN}

'John bought more books than Mary sold magazines'

(177) Predicative Quantity CD ... (vi)

Chislo ljudej s'ejchas bol'she chem bylo ran'she

Number people now more than was before

'The number of people is more than it was ____ before.'

Looking at the degree clausal comparatives, they are generally degraded. The predicative CD is shown below.

(178) Predicative Degree CD⁵⁶ ... (vii)

??Masha vyshe chem Petja bud'et

M.sg.nom high.comp than P.sg.nom will-be

⁵⁶ The future tense is used here, since the present tense auxiliary must be elided and the sentence becomes ambiguous with a phrasal comparative.

‘Masha is taller than Peter will be.’

As shown below, direct translation of the predicative degree CSD in English to Russian is also ungrammatical, while paraphrasing the sentence into a phrasal comparative is possible.

(179) Predicative degree CSD ... (viii)

a. *Stol vyshe chem polka shirokaya. (Berezovskaya 2013; p.33)

Table high_{COMP} than shelf wide_{FEM}

‘Intended: The table is higher than the shelf is wide.’

b. Vysota stola bolshe chem shirinu polki. (p.c. Ksenia Bogomolets)

Height table_{GEN} height than width shelf_{GEN}

‘The height of the table exceeds the width of the shelf.’

Finally, the attributive degree CD and CSD are not grammatical in Russian, either, although there is a slight contrast between the two where the CSD is worse than the CD, probably because of pragmatic reasons (p.c. Pavel Koval).

(180) Attributive Degree CD⁵⁷ ... (ix)

?? ivan kupil bol’eje dlinnyj zont chem Masha

I.masc.nom buy.pst.pfv.3sg.masc more long umbrella.sg.nom|acc than M.fem.nom

⁵⁷ Berezovskaya (2013) reports that the genitive-marked synthetic comparative counterpart of the Attributive Degree CD is ungrammatical.

(i) *Masha kupila bystree kompjuter Billa. (Berezovskaya 2013; 43)
Masha.Nom bought faster computer.Acc Bill.Gen
‘Masha bought a faster computer than Bill.’

prodala.

sell.pst.pfv.3sg.fem

(181) Attributive Degree CSD ... (x)

a. *Ivan kupil bol'eje dlinnuju / dlinn'eje

I.masc.nom buy.pst.pfv.3sg.masc more long.fem.sg.acc / longer.lg.Inst

palku chem Masha prodala zont

stick.fem.sg.acc than M.fem.nom sell.pst.pfv.3sg.fem umbrella

‘*John bought a longer stick than Mary sold an umbrella.’

b. *Ivan gotovit luchshije torty chem on

I.masc.nom make.prs.ipfv.3sg better.pl.acc cake.pl.acc than he.nom

delajet p'echen'je

make.prs.ipfv.3sg cookie.sg.acc(.generic)

‘*John makes better cakes than he can make ____ cookies.’

In sum, Russian shows the same pattern as Japanese, Polish, SC and Slovenian in that the quantity clausal comparatives are allowed while their degree counterparts are generally unacceptable.

3.3.13. Thai⁵⁸

In Thai, a comparative preposition *kwàa/gwah* ‘than’ is obligatory even when it does not take a complement.

⁵⁸ Thai examples in this subsection (where no citation is given) are provided by my consultants, Panat Taranat and Sidney Mao.

(182) Comparatives without *than* ... (i)

a. khorâat yâi kwâa Degree

Korat big than

‘Korat is bigger’ (Iwasaki and Ingkahirom 2005, 96)

b. john mee nangsuh mak gwah Quantity

John has book many than

‘John has more books’

The phrasal comparatives are possible with either quantity-comparison or degree-comparison, as shown below.

(183) Phrasal Quantity Comparative ... (ii)

John mee nangsuh mak gwah nityasan

John has book many than magazine

‘John has more books than magazines.’

(184) Phrasal Degree Comparative ... (iii)

a. Dook-bua sūay kwâa dook-kulâap

Lotus beautiful than rose

‘Lotus flowers are more beautiful than roses.’ (Iwasaki and Ingkahirom 2005, 94)

b. john mee nangsuh nasonjai gwah harry-potter

John has book interesting than harry-potter

‘John has a more interesting book than Harry Potter.’

Turning to clausal comparatives in Thai, instead of a noun phrase after /kwàa/, a clause may appear preceded with *ti*⁵⁹.

- (185) Computer an ni raew gwa ti pom kid
 Computer one this faster than that I thought
 ‘This computer is faster than I thought.’

Attributive quantity CD and CSD are expressed in the following way in Thai. Here *mak* ‘many’ is in the attributive position as adjectives follow the head noun in Thai⁶⁰.

- (186) Attributive Quantity Comparative Deletion (CD) ... (iv)
 Mary kean nangsuh mak gwa ti John ahn
 Mary write book more than that John read
 ‘Mary write more books than John read.’

- (187) Attributive Quantity Comparative SubDeletion (CSD) ... (v)
 John mee nangsuh mak gwah ti bill mee nityasan

⁵⁹ This word *ti* (thîi) is a complementizer in Thai (Iwasaki and Ingkaphirom 2005) and can be used to introduce a relative clause, as shown below.

(i) khon [thîi khâw pay yùu kan taam roŋrian]
 people COMP 3 go stay REC at school
 ‘People who want to stay at school...’

Since Thai allows null objects, it is possible that there is a covert noun that is relativized here in (185).

⁶⁰ For example, the adjective modifying the head noun is used in the following way, where CL (classifier) optionally appears in between.

(i) Náŋsũu (lêm) yà
 Book CL large
 ‘a large book’

John has book more than that Bill has magazine

‘John has more books than Bill has magazines’

A Predicative version of the quantity CD is most naturally expressed in the following way as a phrasal comparative where *muegon* ‘before’ is a noun in Thai, which is similar to the Japanese counterpart.

(188) jamnuan khon mee mak gwa muegon.

number people have more than before

‘The number of people is more than [before]’

The degree counterpart of clausal comparatives with *ti* in Thai are degraded, compared to the quantity clausal comparatives. The predicative CD/CSD are shown below.

(189) Predicative degree CD ... (vii)

a. *john chalad gwah **ti** bill

John smart than that Bill

‘Intended: John is smarter than that Bill is’

b. ??John soong gwa **ti** bill soong

John tall than that Bill tall

‘John is taller than Bill is tall.’

(190) Predicative degree CSD ... (viii)

*Dto soong gwah ti bpra-dtoo gwahng⁶¹.

table high than that door wide

‘The table is higher than the door is wide.’

The paraphrase of this sentence into a phrasal comparative below makes the sentence grammatical (p.c. Panat Taranat).

(191) Kwam soong kong dto mak gwah kwam gwang kong prato

the-quality high of table more than the-quality wide of door

‘The height of the table is more than the width of the door’

The attributive degree CD/CSD is not completely ungrammatical in Thai, but slightly degraded compared to their quantity counterparts or phrasal paraphrases, where the nouns compared are relativized.

(192) Attributive degree CD ... (ix)

a. ?? john seu rom (lêm) yao gwah ti bill seu.

John buy umbrella CL long than that bill buy

‘John bought a longer umbrella than Bill bought.’

b. Phrasal paraphrase

john seu rom ti yao gwah ti bill seu

⁶¹ Beck et al. (2009, 58) assume that this sentence is grammatical and *ti* is optional; however my consultant tells me that this sentence is ungrammatical with *ti*, and definitely worse than the quantity clausal comparatives (QCC). Beck et al. did not include the QCC in their discussion.

John buy umbrella that long more that Bill buy

‘John bought the umbrella that is longer than the one that Bill bought’

(193) Attributive degree CSD ... (x)

a. ?? john seu rom (lêm) yao gwah ti bill seu maitao.

John buy umbrella CL long than that Bill buy cane

‘John bought a longer umbrella than Bill bought a cane’

b. Phrasal paraphrase

john seu rom ti yao gwah maitao ti bill seu.

john buy umbrella that long than cane that bill buy

‘John bought umbrella that is longer than the cane that Bill bought.’

Therefore, I conclude that the DCC in Thai is not as acceptable as it is in languages like English, German, French, Spanish, Bulgarian or Hungarian.

3.3.14. Chinese⁶²

Chinese does not allow “clausal” comparatives. In Chinese, a comparative has a very different structure (see Xiang 2005, Erlewine 2007) as shown below. (The phrasal degree comparative is used here as an example.)

(194) a. Wo bi ta gao Phrasal Degree Comparative ... (iii)

I than him tall

⁶² Chinese translation of the sentences are provided by my consultant, Xiaofeng Wang.

‘I am taller than him.’

- b. Target *bi* standard predicate of comparison

The *bi* ‘than’ and the standard of comparison can be elided in the following ways. The comparative meaning comes from a word *geng* ‘more’ for the quantity comparison, while the gradable adjective in positive form by itself in Chinese has the comparative meaning for the degree comparison.

(195) Comparatives without *than* ... (i)

- a. Lisi de shu geng duo Quantity

Lisi ‘s book more many

‘Lisi has more books’

- b. Zhe ge zhuozi gao Degree

this CL table higher

‘This table is higher’

The relevant phrasal quantity comparative is expressed as in (196) in Chinese as it prohibits the objects to be directly compared as in (197). The grammatical sentence has a relativized NP as the “Target”, using *de*, which can function as a relative clause marker (Tang 1979, Jiang 1990).

(196) Phrasal Quantity Comparative ... (ii)

Lisi yongyou de shu bi zazhi duo

Lisi own rel book than magazine many

‘Literally: [_{NP} The books that Lisi owns] are more than [_{NP} the magazines (that he has)].’

(197) *Lisi yongyou shu bi zazhi duo.

Lisi own book than magazine many

‘Intended: Lisi has more books than magazines.’

When we try to construct clausal comparative counterparts in Chinese, which, as noted above, are disallowed in Chinese, the same relativization strategy makes the sentences grammatical as they become phrasal comparatives. The direct translation of our attributive quantity CD and CSD as in (198a) and (199a) with complement clauses are impossible. On the other hand, when the relevant clauses are changed into the relativized noun phrases, the sentence becomes better.

(198) a. Attributive Quantity Comparative Deletion (CD) ... (iv)

*Lisi xie xin bi [Zhangsan xie xin] duo

Lisi write letter than Zhangsan write letter many

‘Intended: Lisi wrote more letters than [Zhangsan wrote].’

b. Lisi xie de xin bi [Zhangsan xie de xin] duo

Lisi write rel letter than Zhangsan write rel letter many

‘The letter Lisi wrote is more than [the letters Zhangsan wrote].’

(199) a. Attributive Quantity Comparative SubDeletion (CSD) ... (v)

*Lisi yongyou shu bi [Zhangsan yongyou zazhi] duo

Lisi own book than Zhangsan own magazine many

‘Intended: *Lisi has more books than Zhangsan has magazines’

b. Lisi yongyou de shu bi [Zhangsan yongyou de zazhi] duo

Lisi own rel book than Zhangsan own rel magazine many

‘The books that Lisi owns are more than [the magazines that Zhangsan owns].’

The predicative quantity version of the CD is expressed as a phrasal comparative, as shown below, with an NP *yiqien* ‘before’ as the standard of comparison, as in Japanese or Thai.

(200) Renshuo bi [_{NP} yiqien] duo le

Number-of-people than before many become

‘The number of people became more, compared to before’

Cf. The number of people is more than it was ____ before.

The predicative degree CD is also rendered as a phrasal comparative in Chinese as shown below.

(201) Lisi bi [Zhangsan] congming

Lisi than Zhangsan smart

‘Lisi is smart, compared to Zhangsan’

(Intended: Lisi is smarter than Zhangsan is.)

Other types of degree clausal comparatives are all disallowed in Chinese, where again the relativization of the comparative clauses makes them grammatical.

(202) *Predicative Degree CSD ... (viii)

*Zhe ge zhuzi bi nage men kuan de gao.

def CL table compare def door wide DE high

‘This table is higher than the door is wide.’ (Beck et al. 2009, 38)

Cf. [Zhe ge zhuzi de gao] bi [na ge men de kuan] chang

This CL table rel height than that CL door rel width long

‘The height of this table is longer than [NP the width of that door].’

(203) *Attributive degree CD

*Lisi mai le yi ba [[bi [Zhangsan mai le] chang] de san] .

Lisi buy Pst a CL than Zhangsan buy Pst long rel umbrella

‘Intended: Lisi bought a longer umbrella than Zhangsan bought’

Cf. Lisi mai le yi ba [[bi Zhangsan mai **de**] chang] de san. (Beck et al. 2009, 37)

Lisi buy Pst a CL compare Zhangsan buy rel long rel umbrella

‘Lit: Lisi bought a umbrella that is longer than [the one **that** Zhangsan bought]’

(204) *Attributive degree CSD

*Lisi mai le yi gen [[bi [Zhangsan mai le yi ba san] chang] de guaizhang.

Lisi buy Pst a CL than Zhangsan buy Pst a CL umbrella long rel cane

‘Intended: Lisi bought a longer cane than Zhangsan bought an umbrella.’

Cf. Lisi mai le yi gen [[bi [Zhangsan mai **de** san] chang] de guaizhang.

Lisi buy Pst a CL than Zhangsan buy rel umbrella long rel cane

‘Lit: Lisi bought a cane that is longer than the umbrella that Zhangsan bought.’

In sum, the phrasal comparatives are grammatical while none of the clausal comparatives are possible in Chinese, i.e. Chinese apparently disallows clausal comparatives.

3.3.15. Turkish⁶³

Turkish is another language with no clausal comparatives. The comparative in this language is expressed in the following way, without *than*-like preposition (Knecht 1976).

- (205) a. Maria Hans'tan daha uzun. (Beck et al. 2009, 59)

Maria Hans.Abl even tall

‘Maria is taller than Hans.’

- b. Comparee [_{NP} Standard-of-comparison.Ablative] even Gradable-predicate

For example, a standard of comparison that is clausal in nature, i.e. *I thought*, is expressed with nominalization as shown below. Here, the possessive pronoun *benim* precedes and modifies the *düşündüğüm-den*, which adopts an ablative Case ending *-den*, indicating that the standard of comparison here is a noun.

- (206) Maria [_{NP} benim düşündüğüm-den] daha zengin.

Maria my think.particp.1sg.Abl even rich

‘Intended: Maria is richer than I thought.’

The comparison can be expressed without the standard but *daha* ‘even’ is obligatory.

⁶³ Turkish data (where not cited) are provided by my consultants, Deniz Özyildiz and Kadir Gökgöz.

(207) Comparatives without *than* ... (i)

a. Sen daha güzelim.

you even beautiful

‘You are more beautiful.’

b. John-da daha fazla kitap var

John-loc even much book exists

‘John has more books.’

‘Literally: more books exists at John’s’

The phrasal comparatives are rendered in the following way with the ablative Case marker always added to the standard-of-comparison nouns.

(208) Phrasal Quantity Comparative ... (ii)

Mary-nin dergi-den çok kitap-ı var

Mary-gen magazine-abl more book-poss there.is

‘Mary has more books than magazines.’

(209) Phrasal Degree Comparative ... (iii)

a. Maria Hans’tan daha uzun. (Beck et al. 2009, 59)

Maria Hans.Abl even tall

‘Maria is taller than Hans.’

b. Mary-de Harry Potter-dan daha ilginç bir kitap var.

Mary-loc HP-abl daha interesting a book exists

‘Mary has a more interesting book than Harry Potter.’

The Attributive Quantity CD is rendered in the following way, where the standard of comparison has to be nominalized, i.e. the subject Ayşe must have a genitive Case marking and the whole clause is followed by the ablative Case marker.

(210) Orhan [Ayşe-nin al-diğ-in-dan] fazla kabak al-di. (Knecht 1976, 289)

Orhan Ayşe-Gen buy-PART-POSS-ABL more squash buy-Pst.

‘Orhan bought more squash than Ayşe bought squash.’

‘Lit: Orhan, compared to Ayşe’s buying, bought more squash.’

In the predicative quantity CD counterpart too, the standard of comparison must be nominalized in the following way.

(211) İnsan sayı-sı [eski-den ol-duğ-u-n-dan] daha fazla/çok.

People number-poss past-abl be-rel-poss-buffer-abl more many

‘The number of people is more than it was before.’

The predicative degree CD or CSD is reported to be degraded compared to their quantity counterparts even with the nominalization, as shown below.

(212) a. ? Bu elma armud-un ol-dug-un-dan daha sulu. (Knecht 1976, 295)

This apple pear-Gen be-PART-POSS-ABL more juicy

‘This apple is juicier than the pear is.’

b. ? Bu elma armud-un gelecekte ol-aca~-in-dan daha tatlı.

This apple pear-Gen in future be-Part-Poss-Abl more sweet

‘This apple is juicier than the pear is going to be.’

(213) a. * Bıçak çekmecedan derin daha uzun. (Hofstetter 2009, 191)

Knife drawer.Abl. deep even long

‘Intended: The knife is longer than the drawer is deep’

b. ? Masa kapı-nin geniş ol-duğ-un-dan daha uzun. (Knecht 1976, 310)

table door-Gen wide be-Part-Poss-Abl more long

‘Intended: The table is longer than the door is wide.’

These sentences are unnatural as they are most naturally expressed in Turkish in the following alternative way with the deadjectival noun (e.g. *derinlik* ‘depth’) as the standard.

(214) Bıçak çekmecenin derinliğinden daha uzun.

knife drawer.Gen. depth.Abl. even long

‘The knife is longer than the depth of the drawer.’

The attributive degree CD and CSD are expressed again with the nominalization and the ablative Case marking, as shown below.

(215) John [Mary'nin sat-tİG-In-dan] daha uzun bir şemsiye al-dİ

John Mary.gen sell-nmz-3s.poss-abl even long a umbrella buy-pst

‘John bought a longer umbrella than the one Mary sold.’

Cf. John bought a longer umbrella than Mary sold.

(216) John [Mary-nin sat-tİğ-ı şemsiye-den] daha uzun bir baston al-dı.

John Mary.gen sell-rel-poss umbrella-abl more long a stick buy-past

‘John bought a longer stick than the umbrella Mary sold.’

Cf. John bought a longer stick than Mary sold an umbrella.

Overall, Turkish lacks clausal comparatives all together regardless of the quantity/degree distinction.

3.3.16. Summary

The cross-linguistic variation regarding the possibility of the various types of comparatives discussed above is summarized in the table 1 below (“OK” = grammatical, * = ungrammatical, N/A = not possible for an independent reason). Here, recall that “Phrasal” comparatives are the ones where the comparative preposition *than* takes a DP/NP complement, while “CD” (Comparative Deletion) and “CSD” (Comparative Subdeletion) are clausal comparatives, where *than* takes a CP complement. While the predicate is deleted under identity in the CD, only a subpart of the compared clause is deleted in the CSD.

		Eng	Ger	Fre	Ita	Spa	Bul	Hun	Pol	SC	Slov	Rus	Jp	Tha	Ch	Tur
(i)	without than	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	N/A	OK	OK	OK
(ii)	Phrasal Quantity	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
(iii)	Phrasal Degree	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
(iv)	Attributive Quantity CD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	*	*
(v)	Attributive Quantity CSD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	*	*
(vi)	Predicative Quantity CD	OK	OK	N/A	OK	N/A	OK	N/A	N/A	N/A	OK	OK	N/A	N/A	*	*
(vii)	Predicative Degree CD	OK	OK	OK	OK	OK	OK	OK	*	*	*	??	*	*	*	*
(viii)	Predicative Degree CSD	OK	OK	OK	OK	OK	?	OK	*	??	??	*	*	*	*	*
(ix)	Attributive Degree CD	OK	OK	OK	OK	OK	OK	OK	??	??	*	??	*	??	*	*
(x)	Attributive Degree CSD	*	*	*	??	*	*	*	??	??/*	*	*	*	??	*	*

Table 1: Availability of Comparatives

Now, in order to clarify what is crucial here, a table which reduces the patterns to only a two-way distinction (OK or *) is shown below⁶⁴.

⁶⁴ These are the patterns that the analysis proposed below will attempt to capture. The readers should bear in mind that the patterns are somewhat idealized.

		Eng	Ger	Fre	Ita	Spa	Bul	Hun	Pol	SC	Slov	Rus	Jp	Tha	Ch	Tur
(i)	without than	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	N/A	OK	OK	OK
(ii)	Phrasal Quantity	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
(iii)	Phrasal Degree	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
(iv)	Attributive Quantity CD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	*	*
(v)	Attributive Quantity CSD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	*	*
(vi)	Predicative Quantity CD	OK	OK	N/A	OK	N/A	OK	N/A	N/A	N/A	OK	OK	N/A	N/A	*	*
(vii)	Predicative Degree CD	OK	OK	OK	OK	OK	OK	OK	*	*	*	*	*	*	*	*
(viii)	Predicative Degree CSD	OK	OK	OK	OK	OK	OK	OK	*	*	*	*	*	*	*	*
(ix)	Attributive Degree CD	OK	OK	OK	OK	OK	OK	OK	*	*	*	*	*	*	*	*
(x)	Attributive Degree CSD	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 1': Availability of Comparatives (Idealized)

We can now see that there are 3 types of languages: (i) Languages with both the QCC (Quantity Clausal Comparatives) and DCC (Degree Clausal Comparatives), (ii) Languages with QCC and no DCC and (iii) Languages with no QCC or DCC⁶⁵. Among the first group of languages only the attributive degree CSD is generally unacceptable, while the CD counterparts are acceptable. The question is then what is behind these differences among the languages. I will now show that there

⁶⁵ This pattern cannot be captured by previous typological studies of cross-linguistic variation in comparatives, e.g. Stassen (1985). Based on a broader survey, Stassen points out a significant difference in the marker of the standard, claiming that languages like Japanese and Turkish, use a P or a Case-marker, while languages like English and German, use a particle or conjunction that doesn't assign Case. If we assume that clauses cannot have Case (the assumption is, however, controversial, see e.g. Bošković 1995 and Plann 1986) and thus P or Case-marker cannot select a clause, then we can account for the lack of clausal comparatives in languages like Turkish or Chinese here. However, this cannot explain then why languages like Japanese still allow quantity clausal comparatives, unless we assume that QCC in P/Case-marker languages always has a hidden nominal (and thus is actually a phrasal comparative). However, in chapter 2 I argued that languages like Japanese in fact have QCC without a hidden nominal. Thus, Stassen's difference does not correlate with having/lacking clausal comparatives.

is a correlation here with an independent cross-linguistic variation argued for in Bošković (2005, 2008a, 2009, 2013), where the relevant property is whether a language has definite articles.

3.4. Correlation with the NP/DP

Bošković (2008a, 2012 and references therein) establishes a number of generalizations based on wide-ranging syntactic and semantic phenomena that correlate with the presence or absence of articles in the languages, based on which Bošković argues that languages without articles lack the DP layer. The generalizations are given below.

- (217) a. Only article-less languages may allow left-branch extraction out of NP.
- b. Only article-less languages may allow adjunct extraction from NP.
- c. Only article-less languages may allow scrambling.
- d. Multiple-wh fronting article-less languages do not show superiority effects.
- e. Only languages with articles may allow clitic doubling.
- f. Article-less languages do not allow transitive nominals with two genitives.
- g. Head-internal relatives display island sensitivity in article-less languages, but not in languages with articles.
- h. Polysynthetic languages do not have articles.
- i. Only languages with articles allow the majority reading of MOST
- j. Article-less languages disallow negative raising (i.e. strict clause-mate NPI licensing under negative raising); those with article allow it.
- k. Negative constituents must be marked for focus in article-less languages.
- l. The negative concord reading may be absent with multiple complex negative constituents

- only in negative concord languages with articles.
- m. Radical pro-drop may be possible only in article-less languages.
- n. Number morphology may not be obligatory only in TNPs of article-less languages.
- o. Elements undergoing focus movement are subject to a V-adjacency requirement only in languages with articles.
- p. Possessors may induce an exhaustivity presupposition only in languages with articles.
- q. Inverse scope for S-O is unavailable in article-less languages.
- r. Sequence of Tense is found only in languages with articles.
- s. Second position clitics are found only in article-less languages.
- t. Obligatory numeral classifier systems are found only in article-less languages.
- u. Only article-less languages may allow subject reflectives.

Based on these differences, he proposes a NP/DP parameter where languages with articles like English are DP languages and languages like Japanese which do not have articles are NP languages. Assuming the distinction, I modify Table 1' to include the NP/DP distinction for the languages under consideration. What we see here is that the bolded part in the table indicates that there is a correlation between the NP/DP status of a language and the availability of particular comparatives.

		Eng	Ger	Fre	Ita	Spa	Bul	Hun	Pol	SC	Slov	Rus	Jp	Tha	Ch	Tur
	NP/DP	DP	DP	DP	DP	DP	DP	DP	NP	NP	NP	NP	NP	NP	NP	NP
(i)	without <i>than</i>	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	N/A	OK	OK	OK
(ii)	Phrasal Quantity	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
(iii)	Phrasal Degree	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
(iv)	Attributive Quantity CD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	*	*
(v)	Attributive Quantity CSD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	*	*
(vi)	Predicative Quantity CD	OK	OK	N/A	OK	N/A	OK	N/A	N/A	N/A	OK	OK	N/A	N/A	*	*
(vii)	Predicative Degree CD	OK	OK	OK	OK	OK	OK	OK	*	*	*	*	*	*	*	*
(viii)	Predicative Degree CSD	OK	OK	OK	OK	OK	OK	OK	*	*	*	*	*	*	*	*
(ix)	Attributive Degree CD	OK	OK	OK	OK	OK	OK	OK	*	*	*	*	*	*	*	*
(x)	Attributive Degree CSD	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 2: NP/DP parameter and availability of DCC

More precisely, the generalization that we find here is that there is a one-way correlation between the availability of the Degree Clausal Comparatives and being a DP language⁶⁶:

⁶⁶ A potential counterexample could be Khmer, which is an NP language, but it is reported to have DCC in Snyder (1995), as shown below. This could be an instance of a predicative degree CSD. Here *nigh* ‘this’ modifies *twia* ‘door’.

(i) Pkol nigh we:n jieng twia nigh kpo.

Pole this long(er) than door this high

‘This pole is longer than this door is high.’ (Snyder 1995, 132)

It is possible that the predicative adjective *kpo* follows a phonologically null present tense copula here in the comparative clause. There is also the possibility that the comparative clause is nominalized (although there is a nominalized version of adjective *kpo* ‘high’, i.e. *kompous* ‘height’). Stassen (1985) categorizes Cambodian comparatives as the “exceed” type, where the word *jieng* is used as a verb “exceed” rather than a preposition. This can be shown in other contexts as in the following example, which expresses superlative.

(ii) Twia nis weng jieng ke

Door this wide exceed it-all

‘This door’s width exceeds it all/this door is the widest’

Furthermore, copula verb (*keu* ‘is’ or *tlop* ‘used to be’) is optional in Khmer and can appear in the main clause of (i); however, the same copula elements cannot appear in the comparative clause (p.c. Sidney Mao), as shown

(218) Generalization

Degree Clausal Comparatives may be possible in a language only if it is also a DP language.

The obvious question, then, is what makes the degree clausal comparatives possible in DP languages while making them impossible in NP languages.

Also, looking at the Tables again, we notice that Attributive Degree CSD (x) is not available anywhere, even in DP languages, while its CD counterpart (ix) is possible. This is also pointed out by the previous literature (Kennedy and Merchant 2000). The difference here is not subsumed under the generalization in (218). I will discuss this issue as well as make a proposal to explain the Generalization in (218) in the next Chapter.

3.5. Summary of the Chapter

In this chapter, I have discussed cross-linguistic variation in comparatives. I started the discussion by pointing out that an LBC-based explanation of the lack of degree compared clausal comparatives in Japanese does not work when we take other languages into consideration, and the semantic/pragmatic approach to these issues also faces problems. Taking a number of factors

below.

- (iii) a. Pkol nigh keu/tlorp we:n jieng twia nigh kpo.
Pole this is/used-to-be long(er) than door this high
'This pole is/used to be longer than this door (is) high.'
- b. *Pkol nigh we:n jieng twia nigh keu/tlorp kpo.
Pole this long(er) than door this is/used-to-be high
'This pole (is) longer than this door is/used to be high.'
- c. *Pkol nigh keu/tlorp we:n jieng twia nigh keu/tlorp kpo.
Pole this is/used-to-be long(er) than door this is/used-to-be high
'This pole is/used to be longer than this door is/used to be high.'

This may suggest that *than* complement in (i) is not a genuine clause, but further investigation is needed. I leave examining this issue in detail for future research.

regarding variation in comparatives (phrasal-clausal, degree-quantity, attributive-predicative) into consideration (which was not done in the previous literature), I have conducted a cross-linguistic survey on the availability of 10 different types of comparatives in 15 languages, in order to clarify cross-linguistic variation in comparatives. We have seen that the pattern attested in Japanese is also found in other languages. I pointed out that there is a common property among such languages, based on a parametric variation concerning the NP/DP parameter (Bošković 2008a, 2012); in particular, they are all NP languages. The generalization that I established here is that degree clausal comparatives may be possible in a language only if it is also a DP language. Also, as the previous literature suggests, I found from the survey that one type of degree comparatives, i.e. attributive degree CSD, is not allowed even in DP languages. In the next chapter, I will examine how the correlation between degree clausal comparatives and the DP/NP parameter as well as the lack of attributive degree CSD in DP languages can be accounted for.

Chapter 4

Operators in NP/DP Languages

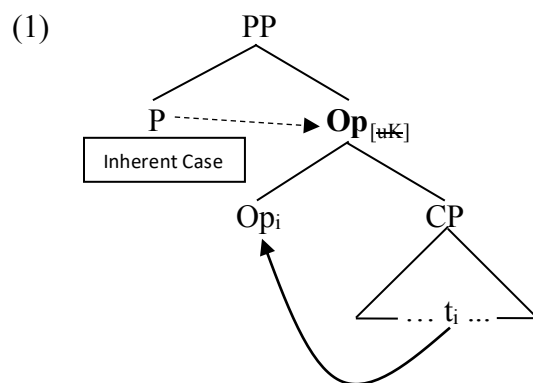
In this chapter, I will propose an answer to the question raised in the previous chapter, namely what makes degree clausal comparatives possible in DP languages while making them impossible in NP languages. In Chapter 2, I proposed that the null Op involved in clausal comparatives has an uninterpretable Case feature [uK] which triggers its movement, where it moves to be Case-licensed by *than* through inherent Case assignment in a sisterhood configuration. Based on this, the contrast where DP languages allow degree clausal comparatives while NP languages do not will be accounted for by saying that the Op is bare, i.e. non-branching, in NP languages, as a result of which it gets frozen (Rizzi 2006, 2007; Bošković 2008b) in the base position when it is in the complement position of an inherent Case assigning head like A. This is not the case in DP languages since the Op has a more complex structure with an extra projection, which prevents the freezing effect. I will also suggest an explanation for the fact that the CD of degree attributive clausal comparatives is grammatical while the CSD version is unavailable even in DP-languages, based on Kennedy and Merchant (2000), who propose a PF crash analysis.

4.1. Bases for the Analysis

4.1.1. Nature of the Op Movement

Based on Chomsky (2000), I claimed in Chapter 2 that the null Op lacks ϕ -features but has an uninterpretable Case feature [uK] to be checked off and that prepositions like *than* can assign inherent Case, which needs no ϕ -features for checking. As a result, prepositions can check the Case of the projected Op without establishing a feature checking relation but through a head-

complement relationship. The uninterpretable Case feature is the reason why the Op has to keep moving, where the [uK] triggers the movement of the Op in the spirit of Bošković (2007), where it is claimed that the need for a NP/DP to check Case can drive the movement of the NP/DP. After the movement, based on the Labeling Algorithm by Chomsky (2013), which states that a head projects when the head and a phrase merge, I claimed that the Op projects itself as a label in order to be in the prepositional complement position where it gets its [uK] licensed by being assigned inherent Case by the comparative preposition *yorī* ‘than’. The analysis is illustrated below.



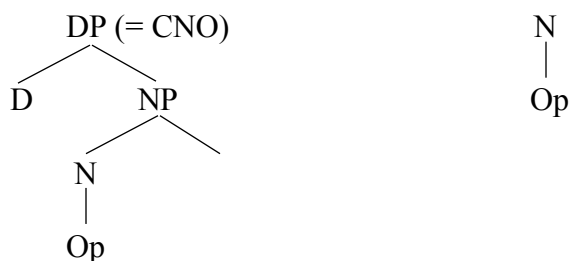
I assume this analysis of Op movement, based on which I will explain the lack of degree clausal comparatives in NP-languages.

4.1.2. Null Operators

Recall that Bošković (2005, 2008a, 2009, 2013) argues that languages without articles lack the DP layer based on a number of generalizations involving wide-ranging syntactic and semantic phenomena that correlate with the presence or absence of articles in the languages; he proposes the NP/DP parameter where languages with articles are DP-languages and the ones without are NP-languages, lacking the DP layer.

Based on this, I claim that there is a structural difference between Ops in DP-languages and NP-languages, i.e. Op in a DP-language is a phrase with more complex internal structure and this complex null operator⁶⁷ (henceforth, CNO) is a DP which contains a bare Op as an N head, as shown below (see also Hicks 2009). Since the CNO is a DP, it is available only in DP languages, while the Op in NP languages is always bare (i.e. non-branching). In other words, the NP/DP distinction has a structural reflex in the structure of Op.

- (2) a. DP-languages: Op = CNO b. NP-languages: Op = bare



I will argue that this distinction is crucial in explaining why degree clausal comparatives are not available in NP-languages.

4.1.3. Adjectival Head Assigns Inherent Case

In degree clausal comparatives, the Op/CNO is in the complement position of A, while this is not the case in quantity clausal comparatives since there is no A in the first place. I will argue then that the lack of degree clausal comparatives in NP languages is due to a different behavior of CNO in DP-languages and the bare Op in NP-languages from (2) in the complement of A.

⁶⁷ Hicks (2009) also claims that a null operator in *tough* constructions is a *wh*-phrase with a more complex internal structure than is typically assumed, i.e. a complex DP with the internal DP as the *tough* subject, which is smuggled in the derivation of *tough* constructions. I will come back to the analysis of *tough* construction in Chapter 5. Here, since in comparatives there is no smuggling of the subject, I drop the complement of Op in (2a).

What will be relevant in the discussion is that adjectives assign inherent Case. There are some cases where we can observe that an adjective indeed assigns inherent Case to its nominal complements, e.g. *treue* ‘faithful’ in German, *zahvalan* ‘grateful’ in SC or *yasui/nikui* ‘easy/hard’ in Japanese, as shown in (3-5).

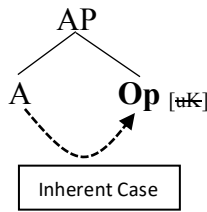
- (3) die [dem Mann treue] Frau
the the.Dat man.Dat faithful woman
‘the woman faithful to her husband’ (German, Fanselow 1986, 343)

- (4) On je zahvalan studentima.
he is grateful students.Dat
‘He is grateful to the students.’ (SC, Talić 2017, 135)

- (5) Taroo-ni eigo-ga hanas-i-yasui/nikui.
Taroo-Dat English-Nom speak-Pres-easy/hard
‘It is easy/difficult for Taro to speak English.’ (Japanese, Hattori 2016, 66)

Assuming that the adjective head A takes the Op as its complement in degree clausal comparatives and that the A assigns an inherent Case to its complement, the [uK] of the Op is always checked in its base-position in NP languages, where Op must be bare, as shown below.

(6) NP languages



As a result, the Op is frozen in this position (in other words, it loses the motivation to move), and the derivation crashes as the Op does not move to the complement position of *than*⁶⁸. This is the reason why degree clausal comparatives in NP languages are prohibited regardless of their type (i.e. attributive or predicative; CD or CSD). On the other hand, in DP-languages, due to the extra projection above the Op in the CNO, the [uK] on the Op is not checked yet since the Op itself is not in a head-complement relation with the A, and so the Op can move out. This is why Predicative Degree Clausal Comparatives are allowed in DP languages⁶⁹.

⁶⁸ The underlying assumption here is that the movement is necessary for semantic reasons, where creating an Op-variable relation or participating in a predicative relation may be relevant here, but these semantic reasons themselves cannot drive syntactic movement.

⁶⁹ If A assigns Case to its complement here, it follows that both CNO, i.e. DP, and Op, i.e. NP, have a Case requirement. A question that arises, then, is whether there are other cases where both DP and NP of the same nominal expression have Case.

In this respect, Chomsky (1995) proposed that in an existential construction like (i), the expletive *there* and its associate *someone* form the same complex DP, *there* being the DP layer and its associate the NP part (see also Bošković 2007, Hornstein and Witkoś 2003, Sabel 2000).

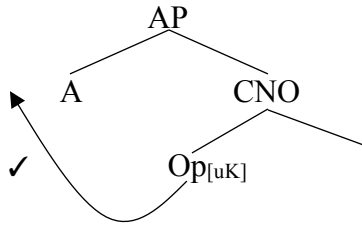
(i) a. There is someone in the garden.

b. [_{DP} there [_{NP} someone]]

What is important for us here is that it has been argued in the literature (e.g. Belletti 1988; Lasnik 1992, 1995, 1999) that the associate in an existential construction must bear partitive Case, which has furthermore been argued to be inherent. We may then have here another case where both the DP and the NP of the same nominal expression independently need Case.

Another possible case comes from clitic-doubling. It has been argued by a number of authors that the clitic and the doubled argument are generated in the same phrase prior to clitic movement (Kayne 2002, Bošković 2018b, and Runić 2014, among others) and that both the clitic and the doubled argument independently need Case (e.g. Sportiche 1996, Jaeggli 1986). This may then be another case where two elements that originate in the same DP independently require Case (in this respect, it should be noted that Bošković 2012 argues that clitic-doubling is possible only in DP languages).

(7) DP languages



Since Quantity Clausal Comparatives do not have an AP in the structure, the freezing effect of the Op as in (6) does not occur. Therefore, such comparatives are available in both NP languages and DP languages⁷⁰. In the next section, I will show, in detail, how my analysis explains the un/grammaticality of each type of clausal comparatives (i.e. Attributive Quantity CD/CSD, Predicative Quantity CD/CSD, Attributive Degree CD/CSD and Predicative Degree CD/CSD) in NP/DP languages.

4.2. Quantity Clausal Comparatives

⁷⁰ Alternatively, we can explain the lack of degree clausal comparatives in NP languages by a different freezing effect of Case-checking. In a Case-checking-without-agreement relation (as in the case of inherent Case assignment), if there is a bare head, the bare head projects without feature-sharing. This is in fact what happens in NP languages where Op is a non-branching element, hence it projects as in (i-a). In DP languages, on the other hand, we are dealing here with a merger of two phrases, DP and AP, as in (i-b).

- (i) a. [_{Op} AP **Op**(head)] NP-language
- b. [AP [_{DP/CNO} D Op] DP-language

The assumption here is that if Op projects, it cannot move further. The Op is then frozen in NP languages but not in DP languages.

Another possible way of accounting for the lack of degree clausal comparatives in NP languages is to argue that AP has different structures in NP languages and DP languages, following Talić (2017). She argues that AP is bare in NP languages while in DP languages, there is an extra projection above AP, which corresponds to the DP layer above NP. Thus, as shown in (ii-a), Op then must be merged with A head in NP languages, being frozen by the inherent Case assignment (it is a sister to the inherent Case-assigning head). On the other hand, as shown in (ii-b), Op is merged with the extra projection (XP) in a DP language; no freezing effect occurs, assuming that inherent Case assignment requires a sisterhood relation (sisterhood with A here).

- (ii) a. [_{AP} A **Op**] NP-language
- b. [XP Op [_{X'} X [_{AP} A]]] DP-language

4.2.1. NP Languages

I will first determine the structural position of Op in quantity clausal comparatives. In Serbo-Croatian (SC), an NP language, possessives (and demonstratives) behave like adjectives and are treated as NP adjuncts (Bošković 2008a, 2012). For example, unlike English counterpart, the SC possessives can occur in the predicate position of a copula, can stack up just like adjectives, and cannot be modified by an adjective.

(8) a. *This book is my.

b. Ova knjiga je moja.

this book is my

(9) a. *this my picture

b. ta moja slika

this my picture

(10) a. rich neighbor's house

b. *bogati susjedov konj

rich neighbor's horse

Despić (2011, 2013) provides an argument for this analysis based on a contrast between English and SC in (10). Since SC lacks DP and the possessor as well as the demonstratives are NP adjuncts, the possessive c-commands out of the NP, resulting in Condition B and C violations (the examples are grammatical without coindexing).

(11) a. *_{[NP Kusturicin_i [_{NP} najnoviji film]]} ga_i je zaista razočarao.

Kusturica's latest movie him is really disappointed

'Kusturica_i's latest movie really disappointed him_i.'

b. *_{[NP Njegov_i [_{NP} najnoviji film]]} je zaista razočarao Kusturicu_i.

his latest movie is really disappointed Kusturica

'His_i latest movie really disappointed Kusturica_i.'

c. *_{[NP Ova_j [_{NP} njegov_i [_{NP} najnoviji film]]]} je zaista razočarao Kusturicu_i.

this his latest movie is really disappointed Kusturica

'This latest movie of his_i really disappointed Kusturica_i.'

Bošković (2014) shows that certain numerals (e.g. *pet* 'five') and quantifiers (e.g. *mnogo* 'many') that assign genitive (thus they are referred to as Genitive-of-Quantification numerals in the literature) project additional structure over NPs, based on the binding test below.

(12) a. [_{QP} Pet/Mnogo [_{NP} njegovih_i [_{NP} filmova]]] je proslavilo Kusturicu_i. (Bošković 2014)

five/many his_{GEN} movies_{GEN} is made-famous Kusturica

'Five/many of his movies made Kusturica famous.'

b. ?_{[QP Pet [_{NP} Kusturicinih_i [_{NP} filmova]]]} ga_i je obogatilo.

five Kusturica's_{GEN} movies_{GEN} him is enriched

'Five of Kusturica's movies made him rich.'

In contrast to (11), the coreference reading is allowed when the numeral/quantifier precedes a possessor as in (12). This means that these elements are not NP adjuncts but do introduce an additional projection; as a result, the possessor no longer c-commands out of the subject NP. As Bošković (2012) shows (see also M. Takahashi 2011), Japanese, which is another NP language, patterns with SC regarding this binding test, i.e. QP above the NP in (13b) confines the c-command domain of the possessor.

- (13) a. *Kare_i-no saisin-no eega-wa Kurosawa_i-o hontooni rakutans-ase-ta.
 him-GEN latest-GEN movie-TOP Kurosawa-ACC really disappoint-CAUSE-PAST
 ‘His latest movie really disappointed Kurosawa.’
- b. Itu-tu-no kare_i-no saisin-no eega-ga Kurosawa_i-o hontooni
 five-CL-GEN he-GEN latest-GEN movie-NOM Kurosawa-ACC really
 rakutans-ase-ta.
 disappoint-CASUE-PAST
 ‘Five of his latest movies really disappointed Kurosawa.’ (Bošković 2012)

Now, regarding the position of the quantifier in an NP language like Russian, Franks (1994), Bailyn (2004) and Bošković (2006) argue that the real quantifier is actually Spec of QP, Q head being null. As shown below, although in Russian a noun following a numeral is assigned genitive, as pointed out by Franks (1994), there are cases where the numeral itself clearly has a non-genitive case, as illustrated in (14), where *po* (distributor) is a dative case assigner.

- (14) Každý učenik polučil po pjati rublej.

each student received distributor five_{DAT} rubles_{GEN}

‘Each student received five rubles.’

Under the assumption that the same element cannot function as a Case assigner and a Case assignee (see Stowell’s 1981 Case Resistance Principle)⁷¹, dative case on the numeral here indicates that the genitive of quantification on the noun is not assigned by the numeral itself but a null head. Thus, Bošković (2014) suggests the following structure for Russian genitive of quantification contexts, with the null Q being the genitive assigner (for our purposes, it does not matter whether the numeral is in spec QP or spec XP)⁷².

(15) [QP numeral [Q' Q [NP expensive [NP cars

That the numeral is not the head itself is confirmed by the fact that it can undergo left-branch extraction, which is a phrasal movement (see Bošković 2013).

(16) Pet je kupio slika.

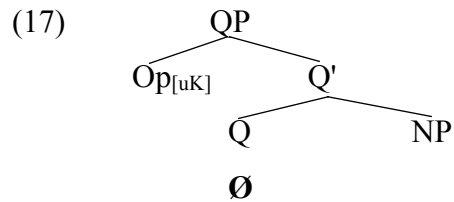
five is bought pictures

‘He bought five pictures.’

Adapting the analyses above, I claim that QCC has null Q head which takes NP as its complement, and Op is in its Spec in NP languages, as shown below.

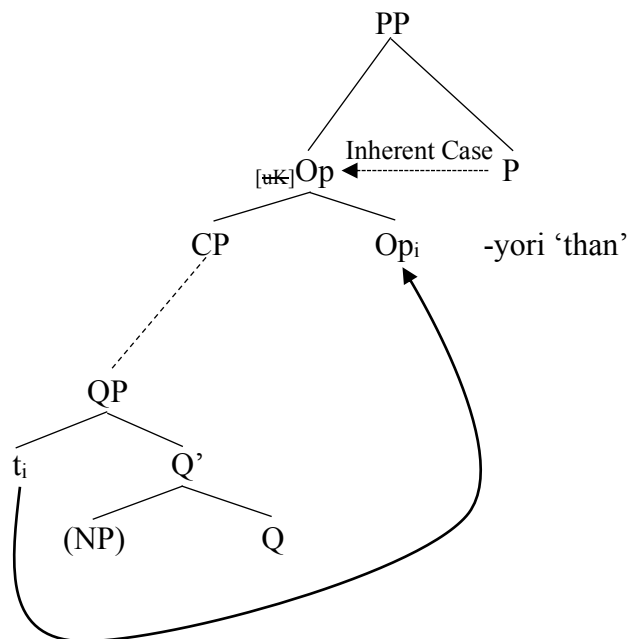
⁷¹ See Bošković (2006) on adnominal genitives from this perspective.

⁷² Bošković actually suggests that Russian and SC differ in that an additional projection is present above QP in Russian, which does not matter for our purposes here.



Based on this, the availability of the Attributive/Predicative Quantity CD/CSD⁷³ in an NP language is explained, as shown below. The Op is base-generated in the QP-spec position and moves out since it has the [uK] and projects when merged with the CP (given that we have here a head-complement case), where its [uK] is checked by inherent Case assignment by P. Crucially, when the Op is base-generated in the structure, it is not in a position where it can get its [uK] checked unlike the situation found in degree clausal comparatives, cf. (6).

(18) NP-languages: ✓



⁷³ Recall that I assume CD and CSD have the same underlying structure following Izvorski (2000).

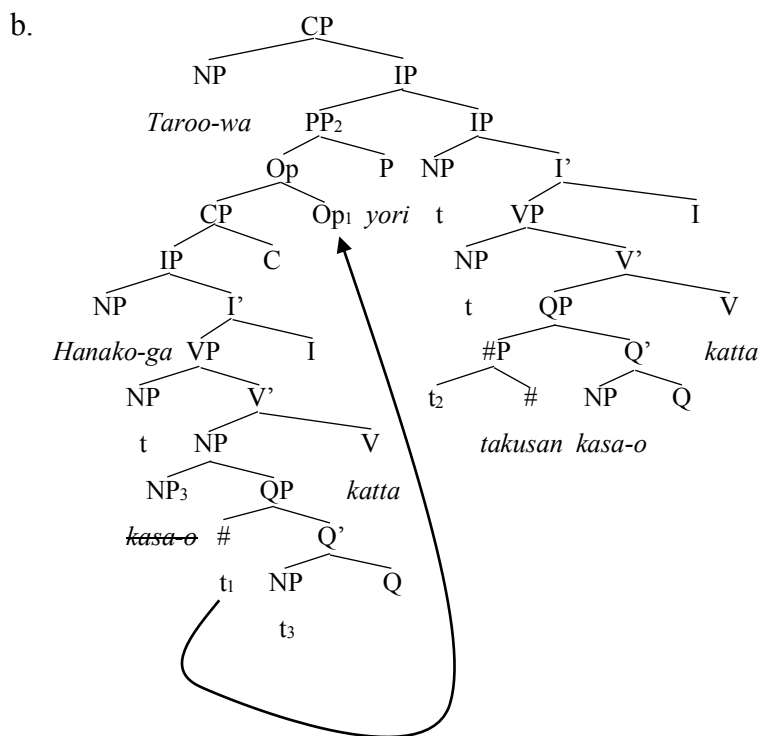
The attributive quantity CD in Japanese then has the following structure, where the Op moves from the base-generated (floating) numeral position, where crucially its [uK] does not get checked.

(19) Attributive Quantity CD in Japanese

a. Taroo-wa [Hanako-ga katta yori (mo)] takusan (-no) kasa-o katta

Taroo-Top [Hanako-Nom bought YORI (mo)] many (-Gen) umbrella-Acc bought

‘Taroo bought more umbrellas than Hanako did/bought.’ (Beck et al. 2004, 290)



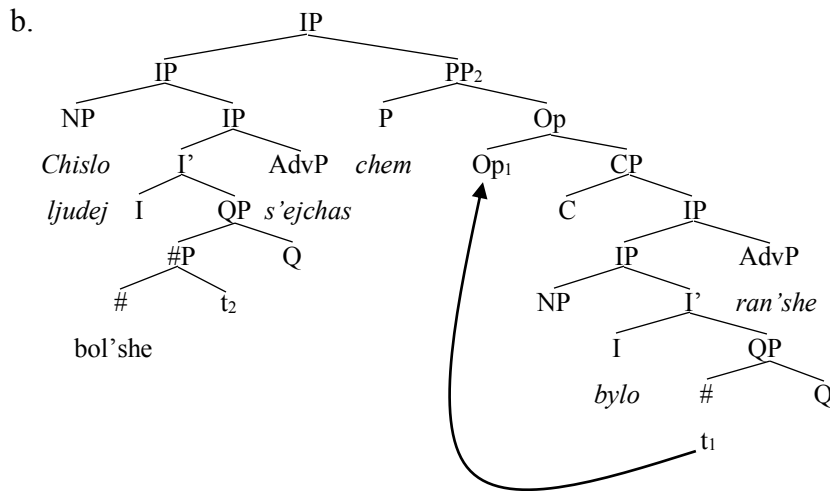
The Op in the predicative counterpart of the quantity CD/CSD in an NP language can also move out from the base-generated position without getting its [uK] checked. Its relevant Russian example is shown in (20a), with the structure given in (20b).

(20) Predicative Quantity CD in Russian

a. *Chislo ljudej s'ejchas bol'she chem bylo ran'she*

number people now more than was before

'The number of people is more than it was ___ before.'



Here the Op is base-generated in the QP-spec position, where its [uK] does not get checked, triggering the movement. Thus, the availability of the QCC in NP languages is explained.

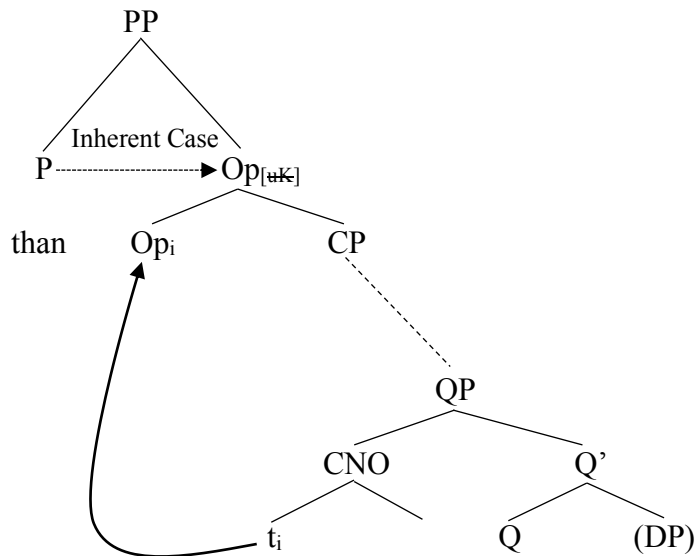
What is important here, then, is whether there is additional structure above Op. In the quantity cases there is, independent evidence for which was provided by the binding patterns in numeral constructions, while in the degree cases there isn't. As a result, Op gets frozen in the latter but not in the former.

4.2.2. DP Languages

I now turn to DP languages. Recall that I assume that in both NP languages and DP languages Op has an uninterpretable Case feature but does not have ϕ -features, as a result of which Op can only get inherent Case.

In DP languages, too, the Attributive/Predicative Quantity CD/CSD has no inherent Case assignment in the base position. The only difference is that DP languages have the CNO instead of just a bare Op (as in NP languages). (21) then shows what happens in DP languages.

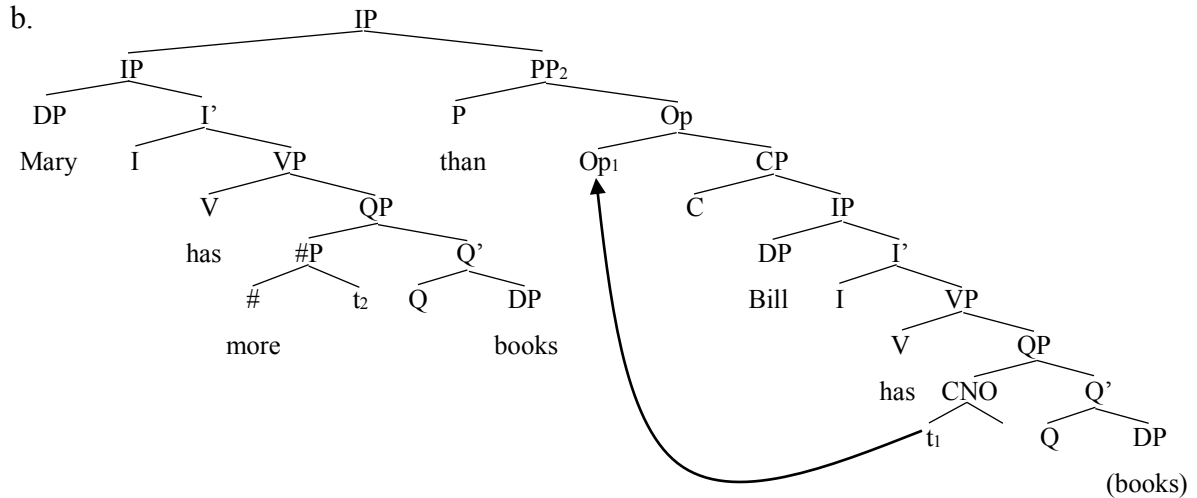
(21) DP-languages: ✓



The Op is base-generated inside the CNO, with its [uK] not being checked, which drives the movement of the Op to the complement position of P. For example, English attributive/predicative CD or CSD has the following structure. Recall that I assume the CD and CSD share the same structure following Izvorski (1995, 2000) (I assume that QP is also present here).

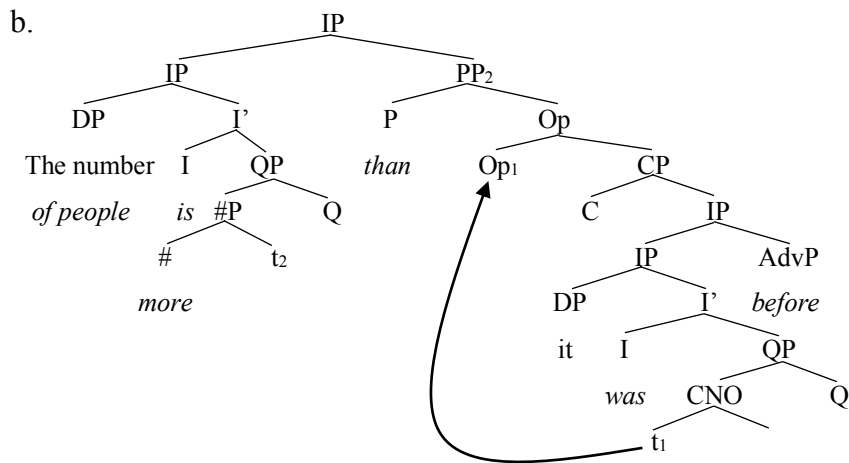
(22) Attributive Quantity CD/CSD in English

a. Mary has more books than Bill has ____ (books). (Izvorski 1995, 203)



(23) Predicative Quantity CD in English

a. The number of people is more than it was ____ before.



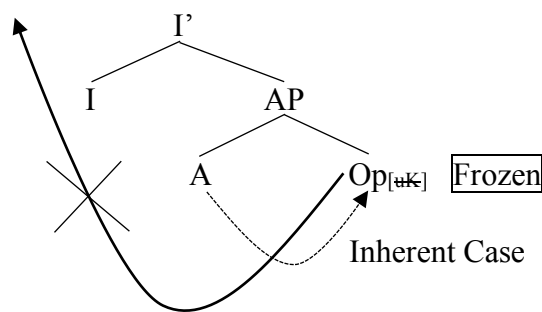
4.3. Predicative Degree CD/CSD

4.3.1 NP Languages

Recall now that the predicative degree CD/CSD is not allowed in NP languages. This can be explained given that the bare Op at the complement of A in its base-position is assigned an inherent

Case through head-complement relation as shown below. The uninterpretable Case feature [uK] is, therefore, checked off at that point, and the Op gets frozen in place.

(24) Predicative Degree CD/CSD in NP-languages: *



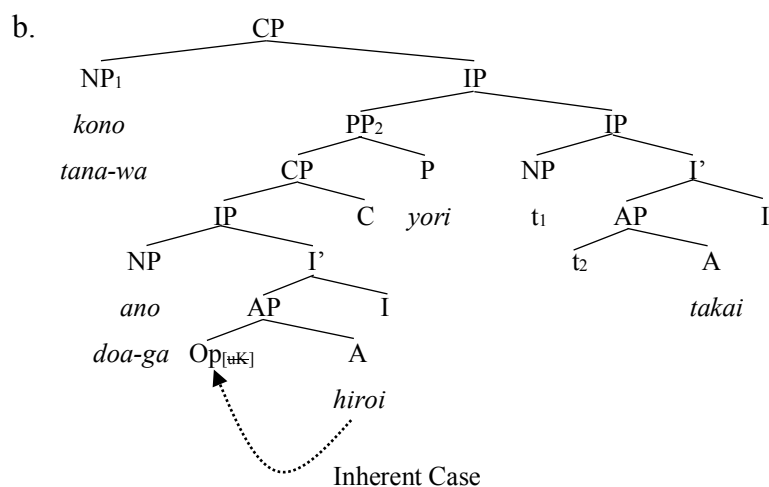
Thus, the predicative degree CSD in Japanese discussed in the previous Section is analyzed in the following way.

(25) Predicative Degree CSD in Japanese

a. *Kono tana-wa [ano doa -ga hiroi yori] takai

This table-Top that door -Nom wide than tall

'This shelf is taller than that door is wide'



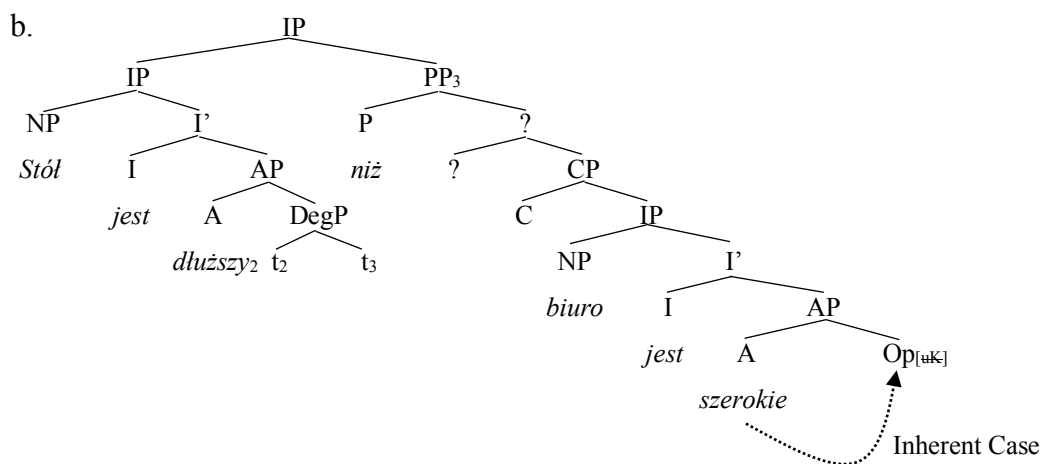
Another example of a predicative CSD in an (head-initial) NP language, namely Polish, is shown below. The adjectival head *szerokie* ‘wide’ assigns an inherent Case to Op as its complement freezing it in place.

(26) Predicative Degree CSD in Polish

a. */??? Stół jest dłuższy niż biuro jest szerokie. (Bacskai-Atkari 2014, 2)

desk is longer than office is wide

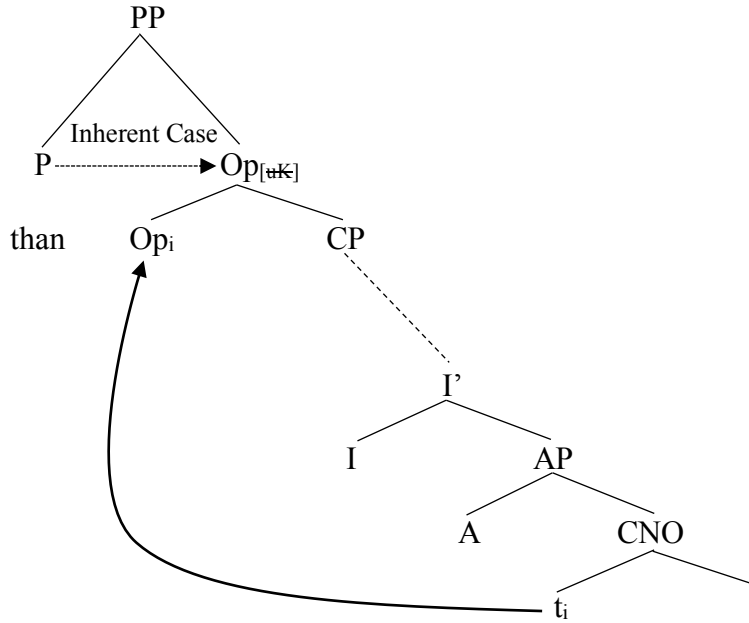
‘The desk is longer than the office is wide.’



4.3.2. DP Languages

Since the CNO is available in DP languages and functions as the complement of the A, the Op does not get frozen, as its [uK] is not checked in the base-position as shown below.

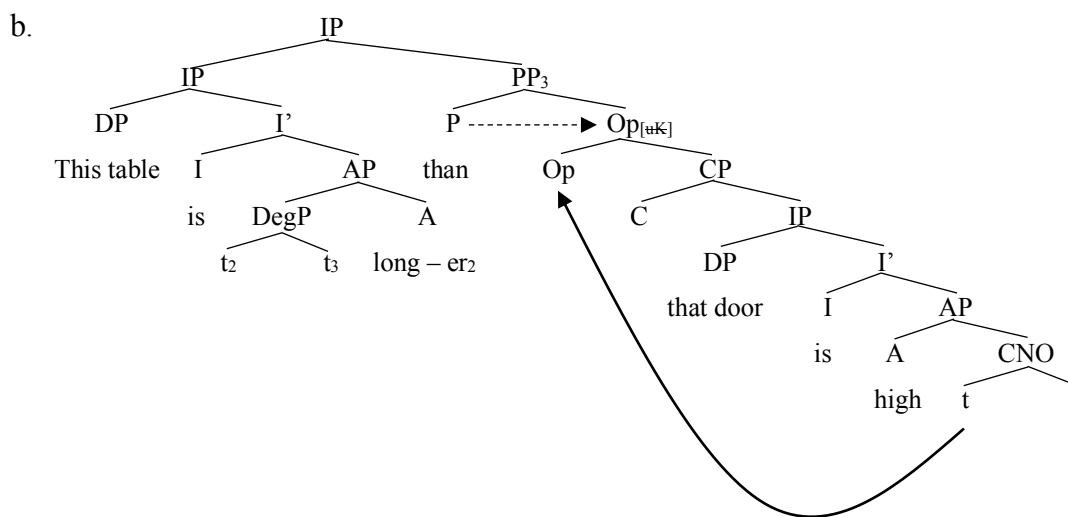
(27) Predicative Degree CD/CSD in DP-languages: ✓



Thus, in the derivation of the predicative degree CSD in English, shown below, the Op is base-generated inside the CNO and its [uK] drives the movement and gets checked after the movement by the preposition *than*.

(28) Predicative Degree CSD in English

a. This table is longer than that door is high.

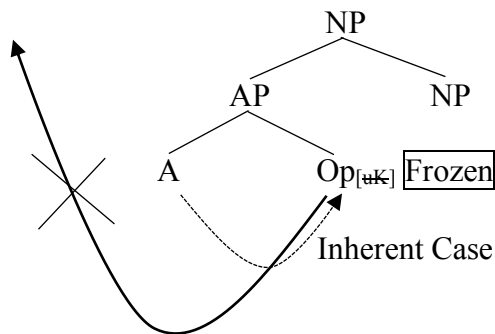


4.4. Attributive Degree CD/CSD

4.4.1. NP Languages

In the attributive version of the CD or CSD too, the Op gets frozen in the complement of A in the base-position in the same way as in NP languages although the whole AP is adjoined to the modified NP, as shown below.

(29) Attributive degree CD/CSD in NP-languages: *



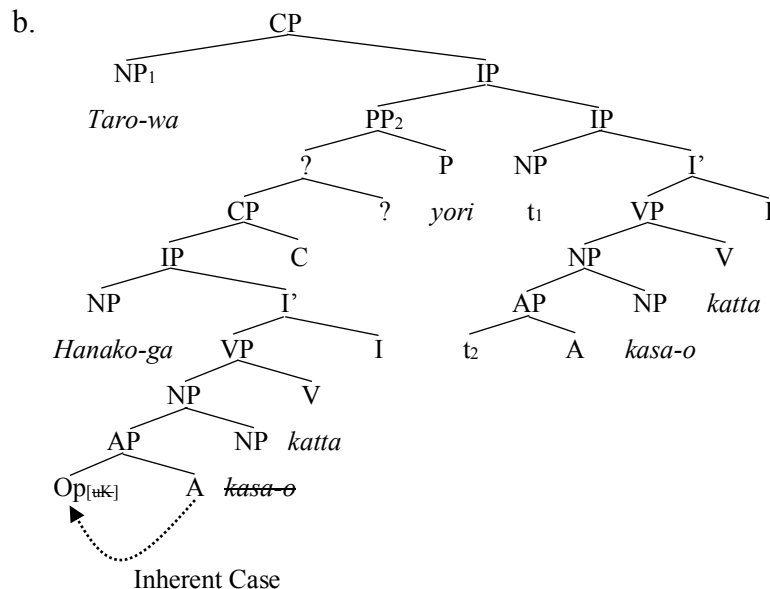
For example, the structure of the attributive CD in Japanese is shown below, where the adjectival head assigns an inherent Case to its complement, and the Op in turn gets frozen and does not move to the complement position of the preposition *yor* ‘than’.

(30) Attributive Degree CD in Japanese

a. ?*Taro-wa Hanako-ga katta yori nagai kasa-o katta (Ishii 1991, 130)

-Top -Nom bought than long umbrella-Acc bought

‘Taro bought a longer umbrella than Hanako bought.’



4.4.2. DP Languages

We saw in the previous chapter that the CD of the degree attributive clausal comparatives was grammatical, while the CSD version was unavailable in DP-languages (\checkmark CD, * CSD). The relevant English examples are given below.

(31) a. Attributive degree CD:

Taroo bought a longer umbrella than Hanako did a longer umbrella. (Beck et al. 2004)

b. Attributive degree CSD:

*Taroo bought a longer umbrella than Hanako bought a longer stick. (Ishii 1991)

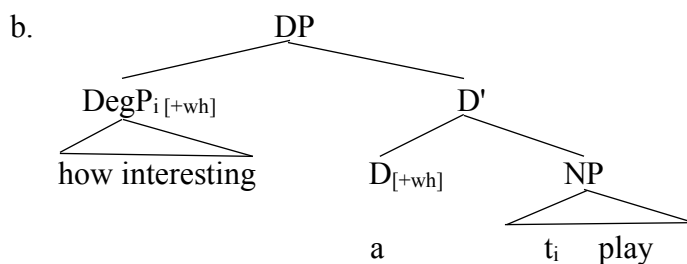
This contrast is found only in DP languages and not in NP languages, where both the CD and CSD are equally unacceptable. The unacceptability of degree attributive CD/CSD follows from the freezing effect associated with simple Op in NP-languages. This is voided by using CNO in DP-languages, hence the acceptability of the attributive degree CD. This, however, does not apply for

its CSD version, i.e. it does not block it. I will tentatively adopt here Kennedy and Merchant (2000), who propose a PF crash analysis, which accounts for the contrast in (32).

- (32) a. *Erik drives a more expensive car than [Op_x Polly drives [DP a [NP t_x [NP motorcycle]]]]
 b. Pico wrote a more interesting novel than [Op_i Brio did ~~write a t_i novel~~].

Kennedy and Merchant adopt Distributed Morphology style late lexical insertion (see Halle and Marantz 1993), where lexical items that corresponds to feature bundles under relevant nodes are inserted late. They also assume that the derivation crashes if the lexicon in that language lacks an item for a node with a certain set of feature combinations due to Full Interpretation (FI). Based on this, K&M claim that the LBC effect in (33) is caused by an uninterpretable feature combination created by agreement between [+wh] DegP and the head of the nominal constituent, i.e. D^0 .

- (33) a. *How interesting_{*i*} did Brio write a t_i play?

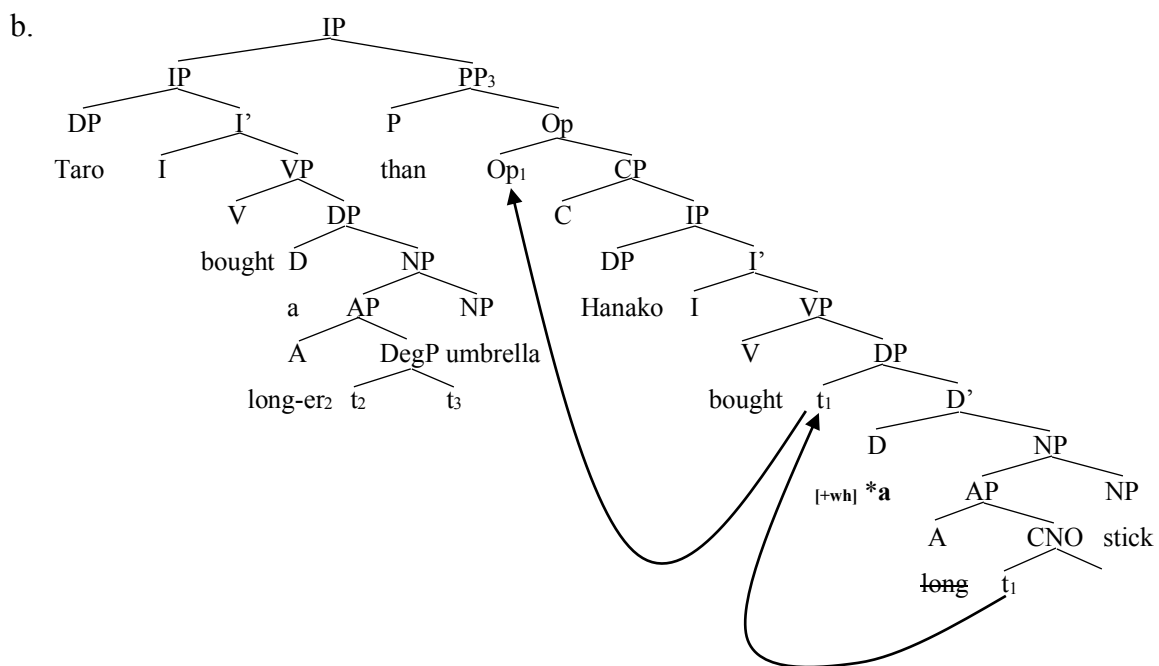


Assuming that the extraction from a nominal constituent XP must proceed via the highest specifier of it (Shlonsky 1991, Aissen 1996 and Merchant 1996), which is natural given that the highest projection in the traditional NP domain is a phase (see Bošković 2014), the [+wh] DegP in the attributive position moves through SpecDP. The [+wh] feature is then passed onto the head of DP,

assuming spec-head agreement between a functional head and its specifier (see Welbelhuth 1992, Chung 1994), i.e. the [+wh] feature on the operator is transferred to D⁰ via spec-head agreement. Since there is no D⁰ element in English lexicon that can be inserted here for representing [+wh] feature on D⁰ and because of the FI requirement, the derivation crashes. In comparatives, it is the null Op that carries the [+wh] feature, which is passed onto the head of DP when the Op moves through the DP-spec in the same way as shown in (34).

(34) Attributive Degree CSD in English

a. *Taro bought a longer umbrella than Hanako bought a ____ stick.



The attributive degree CSD is unacceptable here since the derivation crashes as the D⁰ element representing [+wh] feature doesn't exist in English, just as the overt LBC effect in (33)⁷⁴.

⁷⁴ Admittedly, the analysis raises an issue: the analysis seems to predict that a sentence with wh-movement from a PP complement position like (i) should be ungrammatical, as there would be no D head element representing [+wh] feature when *who* moves through the DP spec position.

(i) Who_i did you see [_{DP} t_i [a friend of t_i]]?

The question that immediately arises is: why does the ellipsis in the derivation of the CD (not CSD) constructions like (30a/32) heal this effect? First, Kennedy and Merchant (2000) assume that ellipsis involves deletion of syntactic structure from the phonological representation (see Sag 1997, Chomsky and Lasnik 1993, Tancredi 1992 and Merchant 1999), and deletion is construed as an instruction to the PF interface to forgo lexical insertion (Wilder 1995). Based on this, the VP headed by *write* in the examples like (32b) is deleted, blocking relevant lexical insertion. Thus, the search for the uninterpretable [+wh] D⁰ item is not initiated in the first place.

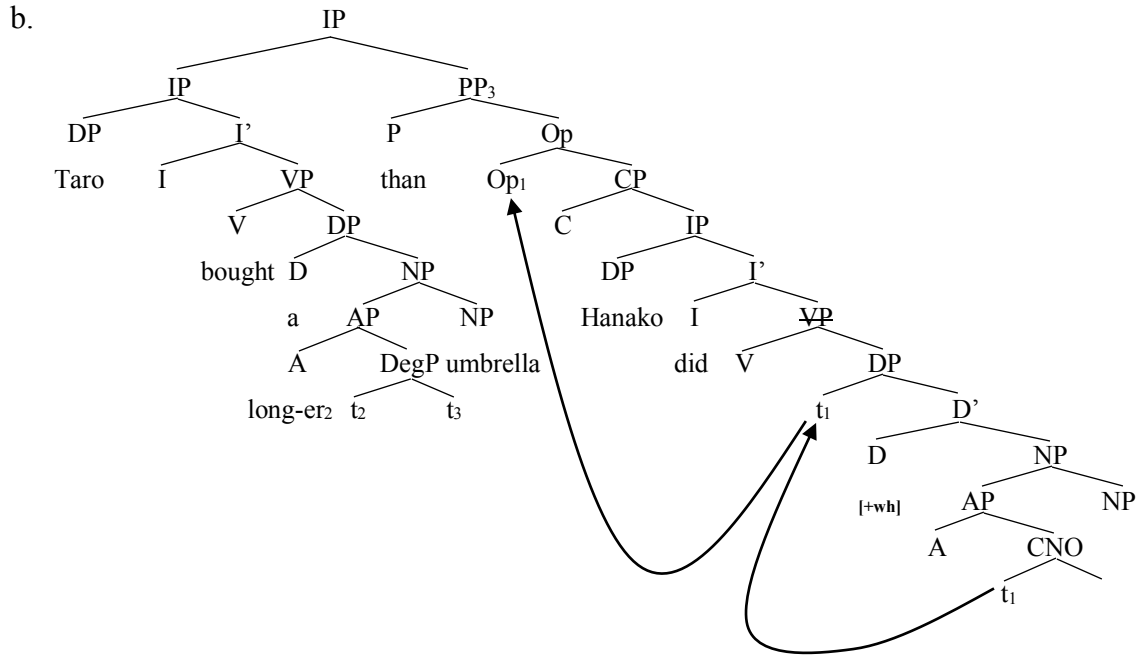
(32b') Pico wrote a more interesting novel than Op_i Brio did ~~write [_i a [_i +wh] _i novel]~~

In this way, the ellipsis (CD) has the effect of eliminating an uninterpretable expression from the PF representation, avoiding the violation of the FI and a PF crash.

(35) Attributive Degree CD in English

- a. Taroo bought a longer umbrella than Hanako did a long umbrella.

Another issue that arises under this analysis is why it is that all DP languages behave in this way (as discussed above regarding English).



4.5. Evidence

4.5.1. PP Complements

I will now provide additional evidence for the proposed analysis based on examples including PP complement of A.

In the literature, for example, “of his student” in “proud of his student” is considered to be the complement of A. This adjective *proud* can be used in the clausal comparatives as shown below. The sentences are categorized as the predicative degree clausal comparative under my system since the adjective appears in the predicative position and the comparison is between two degrees.

(36) The Predicative Degree Clausal Comparatives with PP complement

a. John is prouder of his student than Bill is ~~proud of his student~~.

b. John is prouder of his student than Bill is ~~proud~~ of his family.⁷⁵

⁷⁵ As mentioned in the previous Chapter, the CSD sentence here is different from the other predicative degree

As we assumed that the Op in NP-languages or the CNO in DP-languages is positioned in the complement of A in the above discussion, the question that arises here is, then, where the Op/CNO would be base-generated if the complement of A is already filled by the PP.

The following CD example (taken from Lechner 1999) with a PP complement, where *he* and *John* are coindexed, is ungrammatical⁷⁶. Izvorski (2000) claims that this shows that the Op moves out from an adverbial position alone, leaving behind the *proud of John* in LF.

(37) *Mary is prouder of John_i than he_i is. (Lechner 1999, 21)

Proud of John at the base position in the LF would then cause a violation of the binding condition C (*John* being bound by *he*) inside the subordinate clause (= binding domain), as shown below.

(38) Mary is prouder of John than [*wh* he_i is [~~proud of John_i~~] *t*]

Under her analysis, the Op movement here involves extraction of a null degree denoting adverbial from a non left-branch position. Thus, the base-generated position of Op in the sentences in (36) can be analyzed in the following way, where the DegP (the position of null operator) is adjoined to the AP, as the PP takes up the complement position of A⁷⁷.

CSD in that the adjective used in the comparative clause is identical to the one used in the main clause. We refer to this sentence as the CSD for ease of exposition.

⁷⁶ This sentence (and its acceptability judgement) is taken from the literature, but may be acceptable for some speakers. A consultant informed me that the following similar sentence is acceptable with the coindexing.

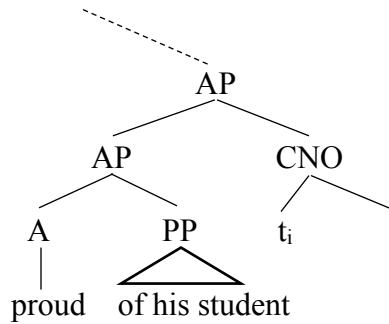
(i) Mary is more aware of John's shortcomings than he is.

⁷⁷ Alternatively, we can assume that *proud* assigns inherent Case to its complement, which is realized through the preposition. *Proud* then does not have inherent Case to assign to the Op. The actual position of the operator would then not really matter here.

(39) The Predicative Degree CD with PP complement

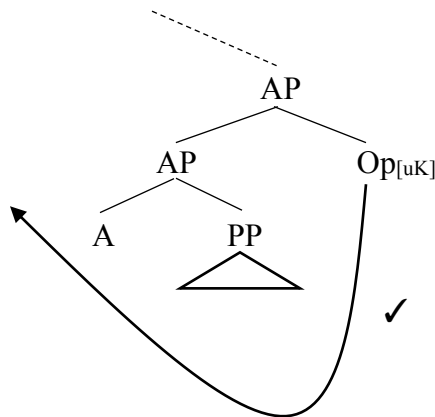
a. John is prouder of his student than [Op_i [Bill is ~~proud of his student~~ t_i]]

b.



If this structure holds in NP languages too, then one prediction can be made: predicative degree CD/CSD should become better in NP languages, as the Op is no longer a complement of A (but a sister of the AP), hence the $[uK]$ of the Op does not get checked in the base generated position.

(40) The Predicative Degree CD with PP complement in an NP language



This prediction in fact is borne out, as the translation of predicative degree clausal comparatives with a PP complement in (36) is acceptable or at least becomes better compared to the ones without the PP in NP-languages.

For example, predicative degree CD or CSD with *dumny ze* ‘proud of’ in Polish are grammatical, and clearly contrast (p.c. Marcin Dadan) with the otherwise ungrammatical predicative degree CD or CSD respectively.

(41) a. Predicative degree CD with PP complement in Polish ... (vii-2)

Jan jest bardziej dumny⁷⁸ ze swoich studentów niż Paweł jest.

Jan is more proud from his students than Paweł is

‘Jan is prouder of his student than Paweł was.’

b. *Maria jest wyższa niż Karol jest. (Predicative degree CD: (vii))

Mary is taller than Charles is

‘Mary is taller than Charles is.’

c. ??Jan jest bardziej dumny niż Paweł jest. (Predicative degree CD: (vii))

Jan is more proud than Paweł is

‘Jan is prouder than Paweł is.’

⁷⁸ The *dumny* ‘proud’ here is analytic (with *more*), since there is no synthetic counterpart (e.g. *prouder*) for this adjective in Polish. Nevertheless, the contrast still holds between more minimal pairs (p.c. Marcin Dadan): (41a) without the PP complement using the same adjective as in (41c) is degraded.

(42) a. Predicative degree CSD with PP complement in Polish ... (viii-2)

Jan jest bardziej dumny ze swoich studentów niż Paweł jest ze swojej rodziny.

Jan is more proud from his students than Paweł is from his family

‘Jan is prouder of his student than Paweł is of his family.’

b. Predicative degree CSD ... (viii)

*Stół jest dłuższy niż biuro jest szerokie.

desk is longer than office is wide

‘The desk is longer than the office is wide.’ (Bacskai-Atkari 2014, 2)

Here, notice that the CSD version with a PP complement in (42a) uses the same adjective *dumny* ‘proud’ in both the matrix and the comparative clause, while the one without a PP complement (Predicative degree CSD) uses two different adjectives, *długi* ‘long’ and *szerokie* ‘wide.’ In this respect, I will also provide examples below with another predicative degree CSD with a PP complement using two different adjectives in both clauses. As shown below, the PP complement CSD with two adjectives in (43a) is still grammatical, and contrasts with the one without the PP complement in (43b)⁷⁹.

(43) a. Mary jest bardziej przywiązana do swojego promotora niż jest z niego dumna.

Mary is more attached to her supervisor than is of him proud

‘Mary is more attached to her advisor than she is proud of him.’

b. ??Mary jest bardziej przywiązana niż jest dumna. (Predicative degree CSD: viii)

Mary is more attached than is proud

⁷⁹ Judgement by Marcin Dadan and Asia Pietraszko.

‘Mary is more attached than she is proud’

In Serbo-Croatian too, the sentences become better (p.c. Ivana Jovović) if the PP-complement taking adjective (*ponosniji na* ‘prouder of’ in SC) is used for a predicative degree CD or CSD, as shown below.

(44) Predicative Degree CD with PP complement in SC ... (vii-2)

?Ivan je ponosniji na svoje studente nego što je Boris.

Ivan.nom is prouder.nom.sg.m of self's student.acc.pl.m than that is Boris.nom

‘Ivan is prouder of his students than Boris is.’

Cf. Predicative Degree CD ... (vii)

*Marija je brža nego što je Jelena.

Marija.nom.f is faster.nom.sg.f than what/that is Jelena.nom.f

‘Maria is faster than Jelena is’

(45) Predicative degree CSD with PP complement in SC ... (viii-2)

a. Ivan je ponosniji na svoje studente nego što je

Ivan.nom is prouder of self's student.acc.pl.m than that is

Boris na svoju porodicu.

Boris.nom of self's family.acc.sg.f

‘Ivan is prouder of his students than Boris is of his family.’

b. Marija je više privržena svom mentoru nego što je ponosna na njega.

Mary is more attached self's advisor than that is proud of him

‘Mary is more attached to her advisor than she is proud of him.’

Cf. Predicative degree CSD ... (viii)

?? Ovaj sto je duži nego što su ta

This.nom.sg.m table.nom.sg.m is longer.nom.sg.m than that are those.nom.pl

vrata široka.

door.nom.pl wide.nom.pl

‘This table is longer than that door is wide.’

The predicative degree CD/CSD in Slovenian is also better with the PP complement of the adjective *ponosnejši na* ‘prouder of’ (p.c. Adrian Stegovec).

(46) Predicative Degree CD with PP complement in Slovenian ... (vii-2)

?Janez je ponosnejši na svojega študenta kot je Boris.

Janez AUX.3 prouder on self's.M.ACC student.M.ACC than AUX.3 Boris

‘John is prouder of his student than Bill is proud of his student.’

(47) Predicative Degree CD ... (vii)

a. * Janez je višji kot je Marija.

John aux taller than aux Mary

‘John is taller than Mary is.’

b. *Janez je ponosnejši kot je Boris.

Janez AUX.3 prouder than is Boris

‘John is prouder than Boris is.’

(48) Predicative degree CSD with PP complement in Slovenian ... (viii-2)

a. ?Janez je ponosnejši na svojega študenta kot je Boris

Janez AUX.3 prouder on self's.M.ACC student.M.ACC as AUX.3 Boris

na svojo družino.

on self's.F.ACC family.F.ACC

‘John is prouder of his student than Bill is proud of his family.’

b. Marija je bolj navezana na svojega mentorja kot je ponosna nanj.

M. is more attached.F on self's.M.ACC advisor.M.ACC than is proud on.him.ACC

‘Marija is more attached to her advisor than she is proud of him.’

Cf. Predicative degree CSD ... (viii)

??Ta miza je dališa kot je ta pisalna miza široka.

This table be.3sg longer than be this desk wide

‘This table is longer than this desk is wide.’

The contrast is observed in Russian, too. When the adjective with a PP complement (i.e. *gord* ‘proud’) is used, the ungrammatical sentences (both the predicative CD and CSD) become better (p.c. Pavel Koval), as shown below.

(49) Predicative Degree CD with PP complement in Russian ... (vii-2)

a. ?Vanya bol'eje gord svoim studentom chem Mihail

Vanya.nom more proud.sh self student.instr than Michael.nom

‘John is prouder of his student than Boris.’

- b. ?Vanya bol’eje gord svoim studentom chem Mihail bud’et
Vanya.nom more proud.sh self student.instr than Michael.nom will-be
‘Vanya is prouder of his student than Michael will be.’

(50) Predicative Degree CSD with PP complement in Russian ... (viii-2)

- a. Vanya bol’eje gord svoim studentom chem Mihail je svojej sjem’joj.
Vanya.nom more proud.sh self student.instr than Michael.nom is self family.instr
‘Vanya is prouder of his student than Michael is proud of his family.’
- b. ?On bol’she napugan svoim nauchnym rukovoditel’jem chem obespokojen vozmozhnoj
he more afraid self scientific manager.instr than worried possible.instr
neudachej.
failure.instr
‘He is more afraid of the advisor than he is worried about possible failure.’

In Thai, a degree predicative CD and CSD with a PP complement is expressed in the following way with the adjective *pumjai* ‘proud’. These sentences are perfectly grammatical, which is contrasted with the sentences without a PP complement (p.c. Panat Taranat).

(51) Predicative Degree CD with PP complement in Thai ... (vii-2)

- John pumjai nakrean khong kao mak gwa Bill pumjai
John proud students of his more than bill proud
‘John is prouder of his students than Bill is’

(52) Predicative Degree CSD with PP complement in Thai ... (viii-2)

a. John pumjai nakrean khong kao mak gwa Bill pumjai kobkrua khong kao

John proud students of his more than Bill proud family of his

‘John is prouder of his students than Bill is of his family.’

b. Mary ying klua advisor khong thex mak gwa Bill pumjai advisor khong kao

Mary more scared advisor of her more than Bill proud advisor of his

‘Mary is more afraid of her advisor than Bill is proud of his advisor.’

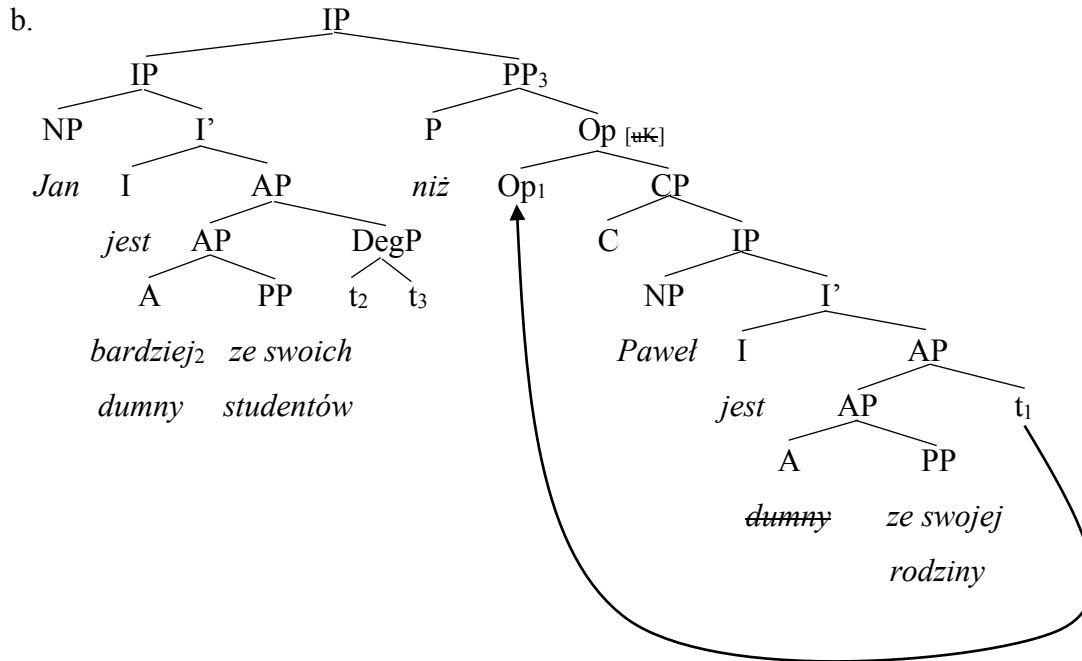
I propose, therefore, that degree predicative CDs or CSDs with a PP complement in the NP languages above have the following structure (the Polish example is used here).

(53) Predicative Degree CSD with PP complement in Polish

a. Jan jest bardziej dumny ze swoich studentów niż Paweł jest ze swojej rodziny.

John is more proud from his students than Paweł is from his family

‘Jan is prouder of his student than Paweł is of his family.’



Here, the Op is base-generated as a sister of the AP since the complement position is filled by the PP (see, however, Footnote 77). The [uK] of the Op, then, does not get checked in this position, driving the movement of the Op to the complement position of the P, which in turn checks the [uK] after the Op projects subsequent to its merger with CP. For this reason, the degree CD/CSD examples in NP languages improve with PP complements.

This analysis does not affect DP languages; CD/CSDs with PP complements are still expected to be grammatical, just like those without PP complements. The CD and CSD with the predicative adjective *proud* which takes a PP complement are indeed grammatical in English.

(54) Predicative degree CD with PP complement in English ... (vii-2)

John is prouder of his student than Bill is proud of his student.

(55) Predicative degree CSD with PP complement in English ... (viii-2)

John is prouder of his student than Bill is proud of his family.

In German, *stolz* ‘proud’ can be used with its PP complement in a predicative degree CD or CSD as shown below.

(56) Predicative degree CD with PP complement in German ... (vii-2)

Der⁸⁰ John ist stolzer auf seinen Studenten als der Bill (es ist)

The.Nom John is prouder of his students than the.Nom Bill it is

‘John is prouder of his student than Bill is proud of his student.’

(57) Predicative degree CSD with PP complement in German ... (viii-2)

a. Der John ist stolzer auf seinen Studenten als der Bill auf seine Familie.

The.Nom is prouder of his student than the.Nom of his family

‘John is prouder of his student than Bill of his family.’

b. Der John ist stolzer auf seinen Studenten als der Bill es auf seine Familie ist.

The.Nom is prouder of his student than the.Nom it of his family is

‘John is prouder of his student than Bill is of his family.’

The PP complement version of the degree CD/CSD is also available in French with an adjective *fier* ‘proud,’ which takes a PP complement headed by *de* ‘of’.

(58) Predicative Degree CD with PP complement in French ... (vii-2)

⁸⁰ The article is used with proper names in some dialects in German, which is intentionally used here to show the Case of the nouns.

Jean est plus fier de son étudiant que Bill ne l'est.

Jean is more proud of his student than Bill EXPL it's

'Jean is prouder of his student than Bill is ~~proud of his student~~.'

(59) Predicative Degree CD with PP complement in French ... (viii-2)

Jean est plus fier de son étudiant que Bill ne l'est de sa famille.

Jean is more proud of his student than Bill EXPL it's of his family

'Jean is prouder of his student than Bill is ~~proud~~ of his family.'

Degree clausal comparatives with *orgoglioso* 'proud' which takes a PP complement are also possible as a CD or a CSD in Italian.

(60) Predicative Degree CD with PP complement in Italian ... (vii-2)

Gianni è più orgoglioso dei suoi studenti di quanto non lo sia Bill.

Gianni is more proud of his students than how-much NEG cl.msg. is Bill

'John is prouder of his student than Bill is proud of his student.'

(61) Predicative Degree CD with PP complement in Italian ... (viii-2)

Gianni è più orgoglioso del suo studente di quanto

John is more proud.msg of+D.mpl his.mpl student.mpl than how-much

Bill lo sia della sua famiglia.

Bill CL.msg be.subj3s of+D.fsg his.fsg family.fsg

'John is prouder of his student than Bill is of his family.'

Spanish has a degree CD/CSD with an adjective (i.e. *orgulloso* ‘proud’) with the PP complement where the fronting of the adjective does not occur as there is no overt adjective in the embedded clause. What is important here is that (62) and (63) are acceptable.

(62) Predicative Degree CD with PP complement ... (vii-2)

a. Juan está más orgulloso de su estudiante que María.

John is more proud of his student than Mary

‘John is prouder of his student than Mary is proud of his student.’

b. Juan está más orgulloso de su estudiante de lo que María jamás (lo) estará.⁸¹

John is more proud of his student of the that Mary never CL will.be

‘John is more proud of his student than Mary will never be.’

(63) Predicative Degree CSD with PP complement ... (viii-2)

Juan está más orgulloso de su estudiante que María de su familia.

John is more proud of his student than Mary of her family

‘John is prouder of his student than Bill is proud of his family.’

The adjective with a PP complement can be used in predicative clausal comparatives in Bulgarian as well, as shown below. The adjective *gord* ‘proud’ takes a PP headed by *sus* ‘with’.

(64) Predicative Degree CD with PP complement ... (vii-2)

⁸¹ Since the copula is obligatory deleted when it is in present tense in Spanish, the auxiliary is used here to disambiguate the sentence from the phrasal comparative.

Ivan e po-gord sus studenta si, otkolkoto e Boris.

Ivan is Comp-proud with student his than is Boris

‘John is prouder of his student than Bill is proud of his student.’

(65) Predicative Degree CD with PP complement ...(viii-2)

Ivan e po-gord sus studenta si, otkolkoto Boris e sus semeistvoto si.

Ivan is Comp-proud with student his than Boris is with family his

‘John is prouder of his student than Bill is proud of his family.’

Turning to Hungarian, the predicative CD/CSD with PP complements using *proud* (*büszké* in Hungarian) are expressed in the following way, where the sublative marking on the noun is used instead of the preposition.

(66) Predicative degree CD with PP complement ...(vii-2)

János büszké-bb a tanítvány-á-ra, mint Bill volt.

J proud-cmpr the student-poss-sublative than Bill was

‘John is prouder of his student than Bill was.’

(67) Predicative degree CSD with PP complement ...(viii-2)

János büszké-bb a tanítvány-á-ra, mint Bill a család-já-ra.

J proud-cmpr the student-poss-sublative than Bill the family-poss-sublative

‘John is prouder of his student than Bill is of his family.’

The data regarding the contrast between predicative degree CD/CSDs and the ones with a PP complement are summarized in the following table⁸².

		Eng	Ger	Fre	Ita	Spa	Bul	Hun	Pol	SC	Slov	Rus	Jp ⁸³	Tha
	NP/DP	DP	DP	DP	DP	DP	DP	DP	NP	NP	NP	NP	NP	NP
(vii)	Predicative Degree CD	OK	OK	OK	OK	OK	OK	OK	*	*	*	*	*	*
(vii-2)	+ PP complement	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	N/A	OK
(viii)	Predicative Degree CSD	OK	OK	OK	OK	OK	OK	OK	*	*	*	*	*	*
(viii-2)	+ PP complement	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	N/A	OK

Table 3: Grammaticality of the degree predicative CD/CSD with PP complement

We have seen that the above analysis accounts for the possibility of predicative degree CD/CSD in DP-languages, where the presence of a PP complement does not make any difference, as well as the contrast found in NP-languages, where predicative degree CD and CSD are unacceptable without a PP complement and improve with a PP complement.

4.5.2. Inherent Complement Verbs

For quantity clausal comparatives in NP languages, which we saw are all grammatical, I have mainly discussed cases with accusative/structural Case assigning verbs so far. For example, relevant Polish sentences are repeated below, where the verb *przeczytaj* ‘read’ assigns accusative Case to its object.

⁸² As before, somewhat idealized judgments are used here in order to make the relevant contrast clearer.

⁸³ Japanese counterparts of the sentences with a PP complement are not available for an independent reason, i.e. *proud of* is expressed with a verb *hokori-ni omou* ‘think proudly of someone’ in Japanese.

(68) Bill przeczytał książki.

Bill read books.Acc

‘Bill read books.’

(69) a. Attributive Quantity CD in Polish ... (iv)

Maria napisała więcej książek niż Bill przeczytał.

Mary wrote more books than Bill read

‘Mary wrote more books than Bill read.’

b. Attributive Quantity CSD in Polish ... (v)

Maria napisała więcej artykułów niż Bill przeczytał książek.

Mary wrote more papers than Bill read books

‘Mary wrote more papers than Bill read books.’

In this section, I will look at cases with inherent Case assigning verbs. Starting with Polish, *zarządzał* ‘manage’ in the language assigns instrumental Case, and *pomógł* assigns dative Case to its complement. When these verbs are used in the comparative clauses, the otherwise grammatical quantity clausal comparatives (both CD and CSD) become ungrammatical (p.c. Marcin Dadan), as shown below.

(70) a. Jan **zarządzał** firmami.

John managed companies.Instr

‘John managed companies.’

b. Jan **pomógł** kobietom.

John helped women.Dat

‘John helped women.’

(71) Attributive Quantity CD with Inherent Complement Verb in Polish ... (iv-2)

a. *Jan kupił więcej firm niż Marcin **zarządzał**.

John bought more company.Acc than Marcin managed

‘John bought more company than Marcin managed’

b. *Jan uwiodł więcej kobiet niż Michał **pomógł**.

Jon seduced more women.Acc than Michael helped

‘John seduced more women than Michael helped’

(72) Attributive Quantity CSD with Inherent Complement Verb in Polish ... (v-2)

*Jan uwiodł więcej studentek niż Michał **pomógł** nauczycielkom .

Jon seduced more students.F.Acc than Michael helped teachers.Dat

‘John seduced more students than Michael helped teachers.’

The similar pattern is found in SC, too. The acceptability of the sentence is clearly degraded (p.c. Ivana Jovović) when inherent Case assigning verbs are used in attributive quantity clausal comparatives. *ugoditi* ‘please’ and *pomozite* ‘help’ take a dative object and *upravlja* ‘manage’ takes an instrumental object.

(73) a. Marija je **ugodila** učiteljima.

Maria is pleased teachers.Dat

‘Maria pleased teachers.’

b. Ivan je **pomogao** ljudima.

Ivan is helped people.Dat

‘Ivan helped people’

c. Bill je **upravljao** kompanijama.

Bill is managed companies.Instr

‘Bill managed companies.’

(74) Attributive Quantity CD with Inherent Complement Verb in SC ... (iv-2)

a. *Ivan je uvrijedio više ljudi nego što je Marija ugodila. Acc-Dat

Ivan is offended more people.acc than what is Maria pleased

‘Ivan offended more people than Maria **pleased**.’

b. *Ivan je kupio više kompanija nego što je Bill upravljao. Acc-Instr

Ivan is bought more companies.acc than what is Bill managed

‘John bought more companies than Bill **managed**.’

c. *Ivan je pomogao više ljudi nego što je Marija ugodila. Dat-Dat⁸⁴

Ivan is helped more people.dat than what is Maria pleased

‘Ivan **helped** more people than Maria **pleased**.’

Cf. Attributive Quantity CD in SC ... (iv) Acc-Acc

Marija je napisala više članaka nego što je

Marija.nom.f is written.sg.f more article.gen.pl.m than what/that is

Ivan pročitao.

⁸⁴ The dative assigning verbs are used in both the main clause and the comparative clause in sentence (74c), ungrammaticality of which suggests that the degradation in other examples is not caused by different Cases.

Ivan.nom.m read.participle.sg.m

‘Mary wrote more papers than Ivan read.’

(75) Attributive Quantity CSD with Inherent Complement Verb in SC ... (v-2)

a. *Ivan je uvrijedio više studenata nego što je Marija ugodila učiteljima. Acc-Dat

Ivan is offended more students.acc than what is Maria pleased teachers.dat

‘Ivan offended more students than Maria **pleased** teachers.’

b. *Ivan je kupio više kompanija nego što je Bill upravljao tvornicama. Acc-Instr

Ivan is bought more companies.acc than what is Bill managed factories.instr

‘John bought more companies than Bill **managed** factories.’

c. *Ivan je pomogao više studenata nego što je Marija ugodila učiteljima. Dat-Dat

Ivan is helped more students.dat than what is Maria pleased teachers.dat

‘Ivan **helped** more students than Maria **pleased** teachers.’

Cf. Attributive Quantity CSD in SC ... (v) Acc-Acc

Mary je procitala više knjiga nego što je John novina. (Snyder 1995, 119)

Mary is read more books.Gen than what is John newspaper.Gen

‘Mary read more books than John (read) newspapers.’

In Slovenian too, *pomoč* ‘help’ takes a dative Case object. When this verb is used in comparative clauses, the grammatical quantity clausal comparatives (both the CD and the CSD) get clearly degraded (p.c. Adrian Stegovec).

(76) Marija je pomagal učiteljem.

Mary is helped teachers.Dat

‘Mary **helped** teachers.’

(77) Attributive Quantity CD with Inherent Complement Verb in Slovenian ... (iv-2)

*Janez je zmedel več ljudi kot je Peter pomagal. Acc-Dat

John aux distracted more people than aux Peter helped

‘John distracted more people than Peter **helped**.’

Cf. Attributive Quantity CD in Slovenian ... (iv)

Marija je napisala več člankov kot je Boris prebral. Acc-Acc

Marija aux wrote more articles than aux Boris read.pst

Mary wrote more books than Bill read.

(78) Attributive Quantity CSD with Inherent Complement Verb in Slovenian ... (v-2)

??Janez je zmedel več ljudi kot je Marija pomagal učiteljem. Acc-Dat

J.Nom aux distracted more students than aux Mary helped teachers

‘John distracted more students than Mary **helped** teachers.’

Cf. Attributive Quantity CSD in Slovenian ... (v) Acc-Acc

Marija je napisala več člankov kot je Boris prebral knjig.

Marija aux wrote more articles than aux Boris read.pst books

‘Mary wrote more papers than Boris read books.’

Similarly, the Russian quantity CD or CSD with an inherent Case assigning verb in subordinate clauses are unacceptable. For example, verbs like *upravljat* ‘manage’, which takes an instrumental object, and *pomogite* ‘help’, which takes a dative object, cannot be used in the comparative clause⁸⁵.

(79) a. Vanʹa upravljal fabrikami.
V.masc.sg.nom manage.past.ipfv.sg.masc factories.pl.instr
‘John managed factories.’

b. Masha pomogla uchitelʹam.
M.fem.sg.nom help.pst.pfv.3sg.fem teacher.pl.dat
‘Masha helped teachers.’

(80) Attributive Quantity CD with Inherent Complement Verb in Russian ...(iv-2)

a. *Vanʹa kupʹil bolʹshe kompanij chem Oleg upravljal Acc-Instr
V.sg.nom buy.pst more.sh companies.acc than O.nom **manage**.past.pfv.sg.masc
‘John bought more companies than Bill managed.’

b. *Vanʹa otvlʹok bolʹshe lʹudej chem Petʹa pomog Acc-Dat
V. distracted more.sh people.acc than P. **helped**

⁸⁵ These inherent Case assigning verbs cannot be used in the main clause either, for a different reason (p.c. Pavel Koval), i.e. the short form comparative morpheme *bolʹshe* ‘more’ cannot take the shape of the inherent Cases (instrumental or dative).

(i) *Vanʹa upravljal [bolʹshe fabrikami] chem Petʹa.
V.sg.nom manage.past.pfv.sg.masc more.sh factory.pl.instr than P
‘John managed more factories than Peter did.’

The sentence would be expressed in the following way with a long form comparative morpheme of the relevant inherent Case with a noun *koľichestvo* ‘quantity’.

(ii) Vanʹa upravljal bolʹshim koľichestvom
V.sg.nom manage.past.pfv.sg.masc more.long.instr quantity.neut.instr
fabrik chem Petʹa kupʹil.
factory.pl.gen than P. buy.pst
‘V managed more quantities of factories than P bought’

‘John distracted more people than Peter helped ____.’

Cf. Attributive Quantity CD in Russian ... (iv)

Masha kupila bol'she knig chem Oleg prodal Acc-Acc

M. buy.pst more.sh books.acc than O.nom sell.past.pfv.sg.masc

‘Masha bought more books than Oleg sold.’

(81) Attributive Quantity CSD with Inherent Complement Verb in Russian ... (v-2)

*Ivan otvl'ok bol'she stud'entov chem Masha

Ivan.masc.nom distract.pst.pfv.3sg.masc more student.pl.gen|acc than M.fem.nom

pomogla uchitel'ej / uchitel'am Acc-Dat

help.pst.pfv.3sg.fem teacher.pl.gen|acc / teacher.pl.dat

‘Ivan distracted more students than Masha helped teachers.’

Cf. Attributive Quantity CSD in Russian ... (v)

Ivan kupil bol'she knig chem Masha prodala zhurnalov. Acc-Acc

John_{NOM} bought more books_{GEN} than Mary sold magazines_{GEN}

‘John bought more books than Mary sold magazines’

In Japanese, there is a limited number of inherent Case-assigning verbs, for example, *au* ‘meet’ which takes a dative object, as shown below.

(82) a. Hanako -ga hon-o yomu.

-Nom book-Acc read

‘Hanako read books.’

b. Hanako –ga Jiro-ni au.

-Nom -**Dat** meet

‘Hanako meet Jiro.’

When this verb is used in a comparative clause in a quantity clausal comparative, the sentence is degraded.

(83) Attributive Quantity CD with Inherent Complement Verb in Japanese ...(iv-2)

??Taroo-wa [Hanako-ga atta] yori hito-ni takusan atta.

-Top -Nom met than person-Dat many met

‘Taroo met more people than Hanako did/met.’

Cf. Attributive Quantity CD in Japanese ...(iv)

Taroo-wa [Hanako-ga kaita] yori ronbun-o takusan kaita

-Top -Nom wrote than paper-Acc many wrote

‘Taro wrote more papers than Hanako did.’

(84) Attributive Quantity CSD with Inherent Complement Verb in Japanese ...(v-2)

??Taroo-wa [Hanako-ga gakusei-ni atta] yori takusan sensei-ni atta.

-Top -Nom student-Dat met than many teacher-Dat met

‘Taro met more teachers than Hanako met students.’

Cf. Attributive Quantity CSD in Japanese ...(v)

John –wa [Bill -ga hon –o motteiru] yori takusan zassi –o motteiru

-Top -Nom book –Acc have-Asp than many magazine –Acc have-Asp

‘John has more books than Bill has ____ magazines.’

(Izvorski 2000, 95)

The above data are summarized in the Table below (with somewhat idealized judgments).

		Pol	SC	Slov	Rus	Jp
	NP/DP	NP	NP	NP	NP	NP
(iv)	Attributive Quantity CD	OK	OK	OK	OK	OK
(iv-2)	+ inherent Case verb	*	*	*	*	*
(v)	Attributive Quantity CSD	OK	OK	OK	OK	OK
(v-2)	+ inherent Case verb	*	*	*	*	*

Table 4: Grammaticality of the quantity CD/CSD with inherent Case verb

On the other hand, attributive quantity CD/CSD with inherent complement verbs are possible in DP languages. For example, the verb with dative object (e.g. *helfen* ‘help’) in German is allowed in the comparative clause of the quantity CD, as shown below.

(85) Peter hat mir geholfen.

Peter has me.Dat helped

‘Peter **helped** me.’

(86) Attributive Quantity CD with Inherent Case Verb in German ... (iv-2)

John hat mehr Leuten geglaubt als Peter geholfen hat. Dat-Dat

John has more people believed than Peter helped has

‘John believed more people than Peter **helped** ____.’⁸⁶

⁸⁶ Cf. SC counterpart:

(i) *Ivan je pomogao više ljudi nego što je Marija ugodila.
Ivan is helped more people.dat than what is Maria pleased
‘Ivan helped more people than Maria **pleased**.’

In French too, the attributive quantity CD with *sourit* ‘smile’, which takes a dative Case object, in the comparative clause is grammatical (p.c. Alexandre Vaxman).

(87) a. John sourit aux oiseaux.

John smiles the.dat birds

‘John smiles at the birds.’

b. Jean regarde plus d'oiseaux que Marie n'en sourit. ... (iv-2) Acc-Dat

J. look more birds than Marie EXPL smile

‘Jean looks at more birds than Marie smiles at’

In Italian, the verb *sorridere* ‘smile’ takes a dative Case object in the same way. This verb used in the comparative clause in the attributive quantity CD/CSD does not cause ungrammaticality (p.c. Roberto Petrosino).

(88) a. Pietro **sorride** agli uccelli/scoiattoli.

Pietro smiled Dat-the birds/squirrels

‘Pietro smiles at the birds/squirrel.’

b. Gianni guarda gli uccelli/scoiattoli.

John looks the birds/squirrels

‘John looks at the birds/squirrels.’

(89) a. Gianni guarda gli uccelli più di quanto Maria sorrida. ... (iv-2)

John look the birds more than how-much Maria smile

‘John looks more at the birds than Maria smiles.’ Acc-Dat

b. Gianni guarda più gli uccelli di quanto Pietro sorrida agli scoiattoli. ...(v-2)

John look more the birds than how-much Pietro smiles Dat.the squirrels

‘John look at more birds than Pietro smiled at the squirrel.’ Acc-Dat

The Spanish counterpart of *sonreír* 'smile' takes a dative object as well. The quantity CD/CSD in Spanish is grammatical even with this verb in the comparative clause (p.c. Gabriel Vera).

(90) Pedro les sonríe a las ardillas.

Peter CL.Dat smiles the squirrels

‘Peter smiles at the squirrels.’

(91) a. Juan mira los pájaros más de lo que Pedro les sonríe. ...(iv-2)

John looks the birds more of the that Peter CL.Dat smiles

‘John looks more (at) the birds than Peter smiles (at)’ Acc-Dat

b. Juan mira los pájaros más de lo que Pedro les sonríe a las ardillas. ...(v-2)

John looks the birds more of the that Peter CL.Dat smiles the squirrels

‘John looks at the birds more than Peter smiles at the squirrels.’ Acc-Dat

Thus, quantity clausal comparatives with an inherent Case assigning verb in DP languages are not significantly degraded, in contrast to NP languages.

		Eng	Ger	Fre	Ita	Spa
	NP/DP	DP	DP	DP	DP	DP
(iv)	Attributive Quantity CD	OK	OK	OK	OK	OK
(iv-2)	+ inherent Case verb	N/A	OK	OK	OK	OK
(v)	Attributive Quantity CSD	OK	OK	OK	OK	OK
(v-2)	+ inherent Case verb	N/A	OK	OK	OK	OK

Table 5: Grammaticality of the quantity CD/CSD with inherent Case assigning verbs

Thus, we can establish the following generalization here.

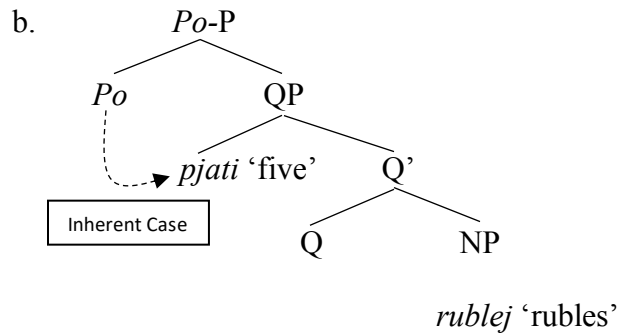
- (92) Quantity CD and CSD in a NP language become ungrammatical when an inherent Case-assigning verb is used in the comparative clause, which is not the case in DP languages

One possible account for this generalization is to argue that the Op, which has an uninterpretable Case feature, gets frozen in the base-position in NP languages by inherent Case assignment from the verb in an exceptional fashion. Recall that inherent Case assignment normally requires sisterhood. There is an exception, namely Russian distributor *po*, which is a dative Case assigner. Franks (1994) and Bošković (2013) argue that the example (93) has the structure shown there, where the real quantifier is actually Spec of QP, Q head is null, and *po* assigns its inherent Case to the quantifier in the Spec QP (which departs from the usual head-complement configuration for inherent-Case assignment).

- (93) a. Každý učenik polučil po pjati rublej.

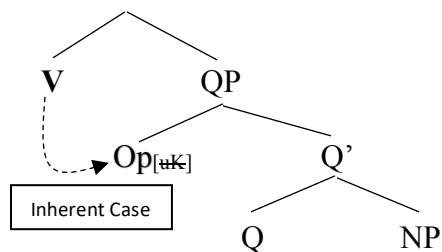
each student received distributor five_{DAT} rubles_{GEN}

‘Each student received five rubles.’



Analogous to this case, we may stipulate that inherent Case assigning verbs are also able to exceptionally assign their inherent Case to the spec of QP in quantity clausal comparatives in NP languages, as illustrated below.

(94) Quantity CD/CSD with Inherent Complement Verb in NP languages



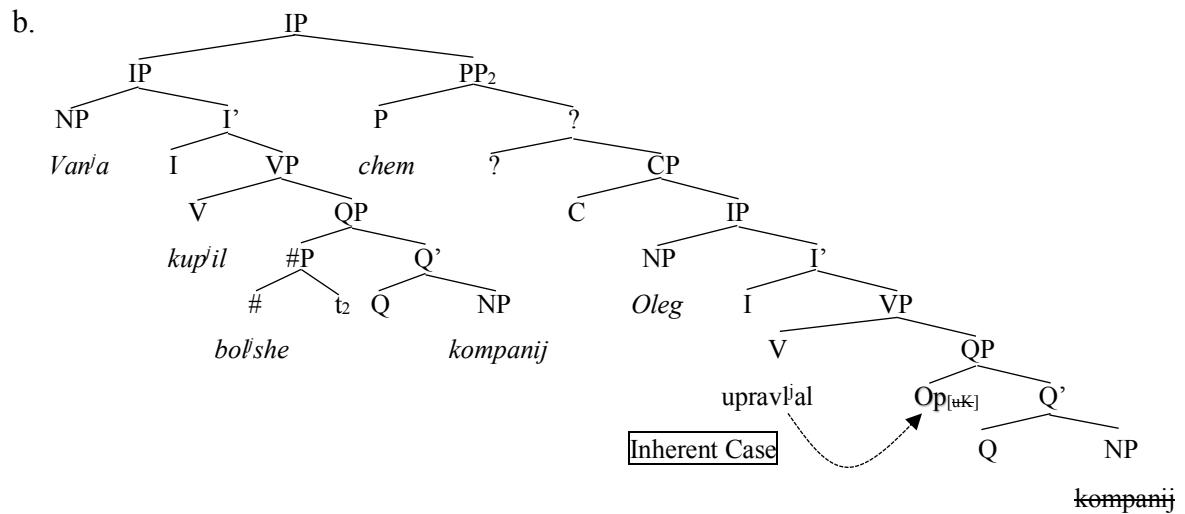
Here, the [uK] of the Op is checked and it gets frozen in the base-position, resulting in the ungrammaticality of the sentence. For example, the attributive quantity CD with the inherent Case verb in Russian (95a) then has the structure in (95b).

(95) Attributive Quantity CD with Inherent Case Verb in Russian

a. *Van'a kup'il bol'she kompanij chem Oleg upravlj'al

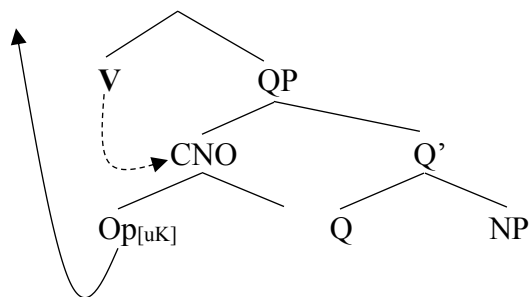
V.sg.nom buy.pst more companies than O.nom manage.past.pfv.sg.masc

‘Vanya bought more companies than Oleg managed.’



On the other hand, in DP languages there is an extra layer above Op which shields Op from this inherent Case assignment and the freezing does not occur, as illustrated in (96).

(96) Quantity CD/CSD with Inherent Complement Verb in DP languages



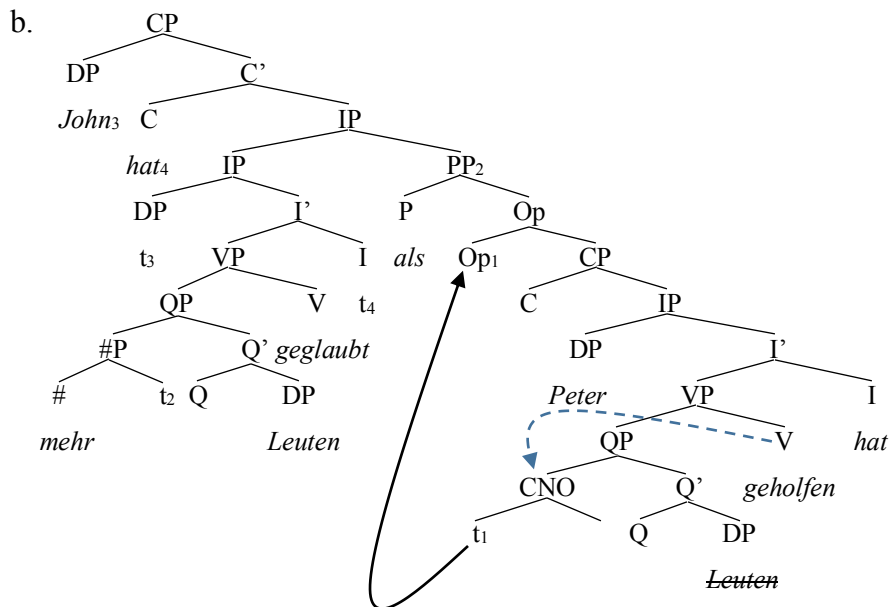
For instance, the German attributive quantity CD in (97a) then has the structure in (97b).

(97) Attributive Quantity CD with Inherent Case Verb in German

a. John hat mehr Leuten geglaubt als Peter geholfen hat.

John has more people believed than Peter helped has

‘John believed more people than Peter **helped** ____.’



Here, the Op is inside the CNO, and thus the V head *geholffen* does not assign its inherent Case to the Op and does not check off its [uK]. The Op, in turn, can move out.

Alternatively, we can retain the claim that inherent Case assignment requires sisterhood and argue that the generalization (92) is attributed to the obligatory nature of inherent Case assignment by the verbs in the relevant languages. Franks (2002) and Bošković (2013) suggest that Case-assigning elements in Slavic differ regarding whether they must assign their Case. Recall that when there is a numeral quantifier, a nominal in the QP is assigned genitive Case in SC (so called genitive of quantification).

(98) pet soba

five rooms.**Gen**

This genitive of quantification overrides the inherent Case assigned by prepositions (locative Case by *u* ‘in’ or dative Case by *prema* ‘toward’), as shown below.

(99) a. sa sobama

with rooms.**Instr**

b. sa pet soba

with five rooms.**Gen**

(100) a. prema Londonu/sobi

toward London.**Dat**/room.**Dat**

b. prema pet soba

toward five rooms.**Gen**

On the other hand, inherent Case-assigning verbs in SC cannot occur in this context, because they must assign their inherent Case⁸⁷.

(101) *Jovan je rukovodio pet fabrika.

Jovan is managed five factory.**Gen**

‘Jovan managed five factories.’

(102) *Jovan je pomogao pet studenata.

⁸⁷ Accusative assigning verbs need not assign their Case.

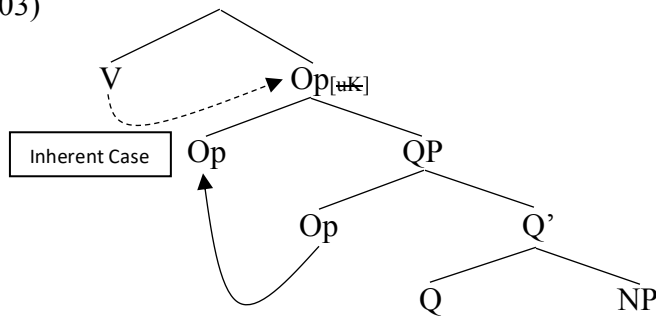
(i) Jovan je kupio pet knjiga.
Jovan is bought 5 books.**Gen**
‘John bought five books.’

Jovan is helped five students. **Gen**

‘Jovan helped five students.’

Then, what is important here is that verbs must assign their inherent Case to their complements. Assuming now that inherent Case can be assigned only in a head-complement configuration, in a quantity clausal comparative with an inherent Case assigning verb, since the verb must assign its inherent Case, Op must move to merge with the QP in NP languages. It projects in this position and gets frozen there after Case-licensing by the verb in a head-complement relation.

(103)



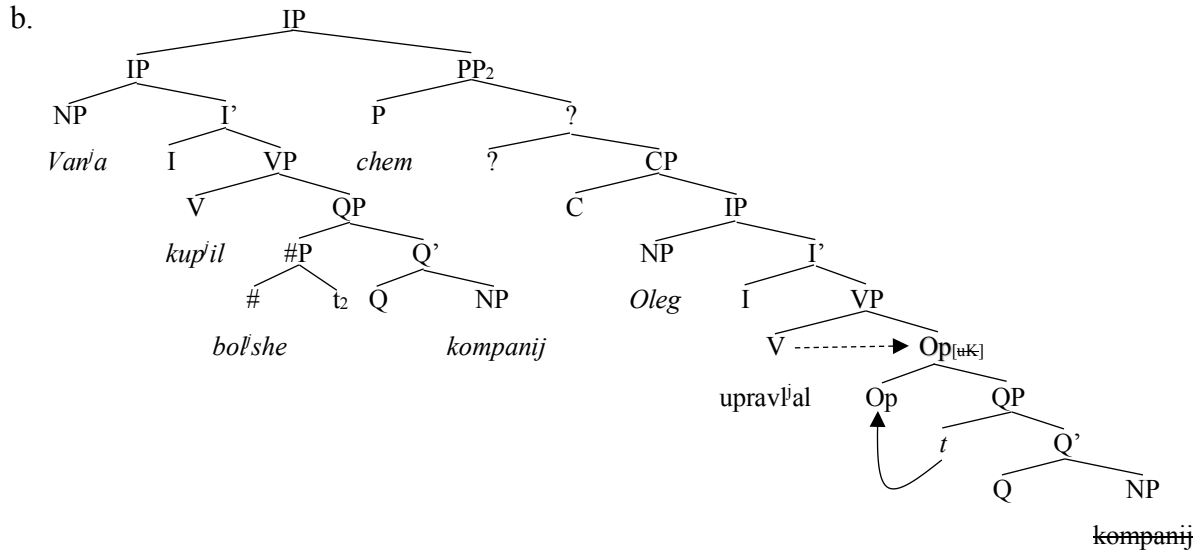
For example, the structure of the relevant sentence in Russian is shown below under this analysis.

(104) Attributive Quantity CD with Inherent Case Verb in Russian

a. *Van^{ja} kup^{il} bol^šshe kompanij chem Oleg uprav^ljal

V.sg.nom buy.pst more companies than O.nom manage.past.pfv.sg.masc

‘Ivana bought more companies than Oleg managed.’



On the other hand, in DP languages, even if the verbs must assign their inherent Case⁸⁸, the phrase above the Op can get the inherent Case; Op can then still move to another position (i.e. complement position of *than*).

4.6. Conclusion

In this chapter, I proposed an explanation to the questions raised in Chapter 3, the main question being what makes degree clausal comparatives possible in DP languages while making them impossible in NP languages. Regarding the nature of Op movement, which is crucially involved here, I have proposed an analysis on which the null Op involved in clausal comparatives has an uninterpretable Case feature [uK] which triggers its movement (it does not have ϕ -features), where it moves to be Case-licensed by *than* through inherent Case assignment in a sisterhood configuration (due to the lack of ϕ -features). What is important is that the adjectival head A can also assign inherent Case to its complement position. Following the NP/DP parameter by Bošković

⁸⁸ Or the verbs there are like prepositions in SC in the relevant respect.

(2008a), since the Op in NP-languages is bare, i.e. non-branching, this inherent Case assignment freezes the Op in place in the base-generated position, while in DP languages this is not the case since the Op has a more complex structure with an extra projection, which prevents the freezing effect. This contrast does not appear in quantity counterparts, as there is no A head involved. I provided some additional evidence for my analysis, e.g. degree clausal comparatives with a PP complement are acceptable in NP languages as the Op is no longer base-generated in the A complement position there. I have also suggested an explanation for the fact that the CD of degree attributive clausal comparatives is grammatical while the CSD version is unavailable even in DP-languages, adopting Kennedy and Merchant (2000), who propose a PF crash analysis. Overall, the un/availability of degree clausal comparatives is attributed to the Op being bare in NP languages while it is part of a more complex structure (= CNO) in DP languages. In the next chapter, I will explore if this contrast holds in other domains, namely the *tough* construction, which has also been argued to involve Op-movement.

Chapter 5

Null Op in *tough* Constructions

I have outlined in the previous chapter the claim that the Op is bare in NP languages, which is not the case in DP languages, where Op can be part of a more complex structure, i.e. a larger phrase. In this chapter, I will explore whether this holds in other domains where Op has been argued to be involved, focusing on *tough* constructions.

5.1. Complex Null Operator Analysis

As briefly mentioned in Chapter 4, Hicks (2009) argues that a complex Op, where DP is crucially present, is needed for *tough* constructions. He argues that a new analysis of *tough* construction is needed since the previous analyses of *tough* constructions have encountered difficulties with at least one of the core theoretical concepts of Case, locality constraints, and θ -role assignment. E.g. the raising analysis of the *tough* subject from the embedded object position by A-movement (e.g. Rosenbaum 1967; an A-movement account) leads to a problem with respect to Case assignment i.e. the *tough* subject should not be able to avoid accusative case assignment by the infinitive verb in the embedded clause.

(1) He_i is easy [_{CP} [_{TP} PRO to please t_i]].

Also, this approach has to explain why the A-movement here can skip another subject position (i.e. the infinitival subject, PRO).

On the other hand, an account based on A'-movement of a null Op (Chomsky 1977) assumes that the *tough* subject is base-generated in situ.

(2) John_i is easy [_{CP} Op_i [_{TP} PRO to please t_i]].

This analysis, however, appears to leave the matrix subject without a θ -role, since the *tough* predicate is claimed to not assign a θ -role to its subject. This is indicated by the grammaticality of the *tough* sentences with expletive/sentential subjects in (3), which is contrasted with other complement object deletion configurations as with *pretty* in (4).

(3) a. It is tough to please linguists.

b. To please linguists is tough.

(4) a. *It is pretty to look at these flowers.

b. *To look at these flowers is pretty.

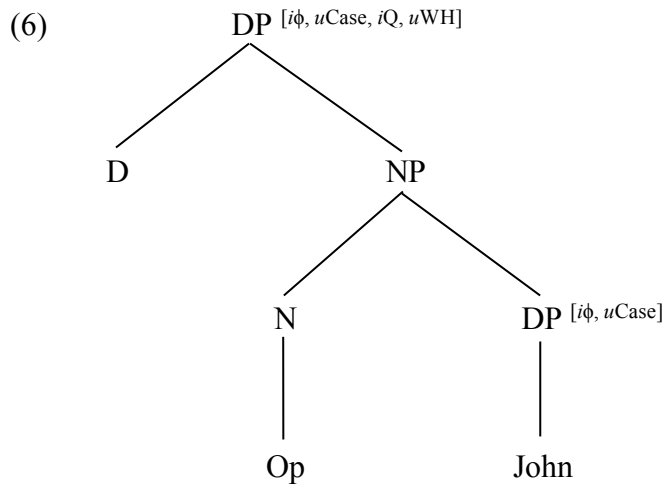
Thus, this A'-movement analysis has to explain how a single θ -role assigned by the embedded verb is apparently “shared” between two arguments, i.e. the null operator in the infinitival clause and the *tough* subject.

Postal (1971), Postal and Ross (1971), Rosenbaum (1967) and Brody (1993), among others propose a composite A/A'-movement analysis by claiming that A'-movement of the *tough* subject is followed by A-movement as shown below.

(5) John_i is easy [_{CP} t_i [_{TP} PRO to please t_i]].

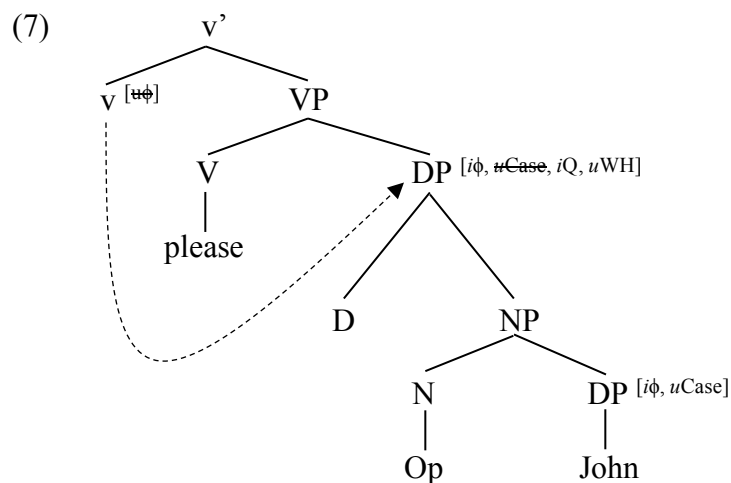
However, the problem of this approach is the Case mismatch of the subject (Accusative vs. Nominative). Another issue is that movement from an A position to an A'-position that is followed by A-movement, referred to as Improper Movement, is typically assumed to be disallowed (See Bruening 2001 and Svenonius 2004).

Hicks (2009) proposes a new analysis which incorporates both A-movement and A'-movement but without the problems of the previous approaches noted above, using smuggling (Collins 2005a, b). He claims that a null operator in *tough* constructions is a *wh*-phrase with a more complex internal structure than is typically assumed, i.e. a complex DP with an internal DP as the *tough* subject as shown below.

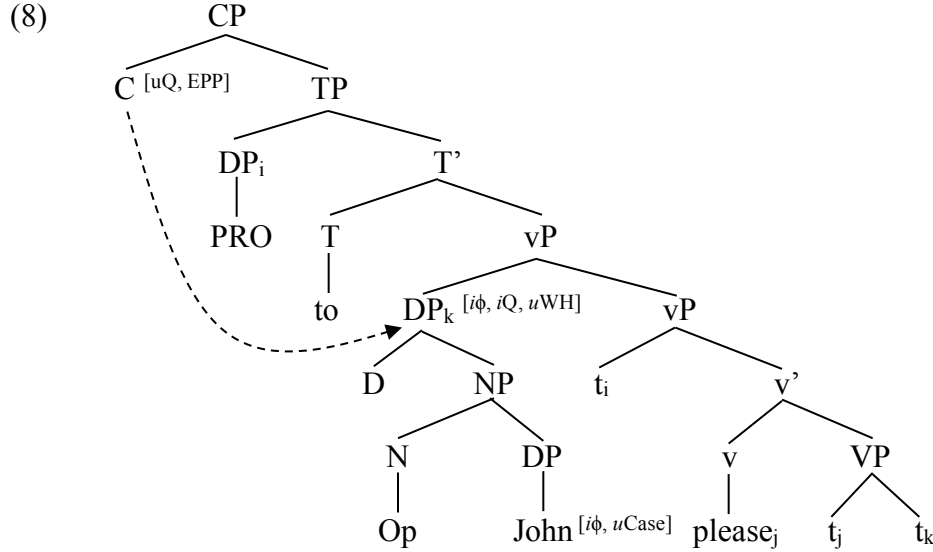


Based on this complex null operator (henceforth, CNO) analysis, the derivation of the *tough* sentence *John is easy to please*, for example, proceeds as follows. First, the CNO merges with the V *please* as an object and the patient θ -role from *please* is assigned to the whole complex DP.

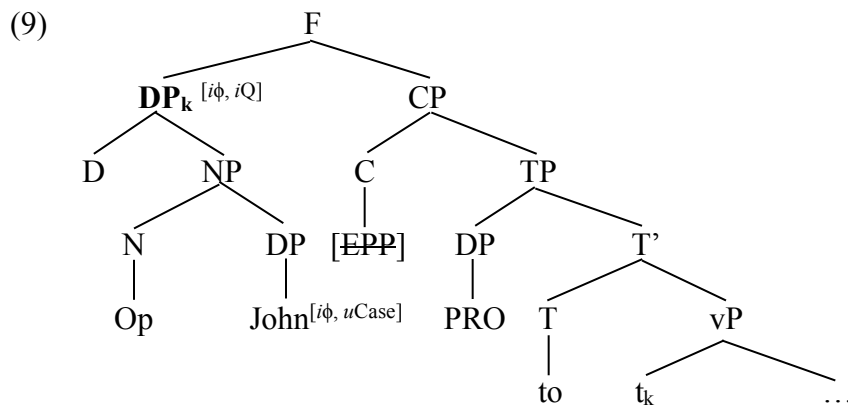
Second, the derived VP is merged with *v*, and the complex null operator enters into ϕ -feature agreement with *v*, [*u* ϕ] (uninterpretable ϕ -feature) on *v* being the relevant probe. As a reflex of ϕ -feature agreement, *v* checks [*u*Case] on the CNO, i.e. the whole DP at this point.



After V-to-*v* movement of *please* and the merger of PRO as the external argument, the CNO must move to the phase edge (outer vP-spec) since it bears [*i*Q, *u*WH] feature (cf. Bošković 2007, where the presence of an uninterpretable feature induces movement to a phasal edge), where crucially, the operator pied-pipes the inner DP *John*, allowing [*u*Case] on it to escape. The null operator therefore serves to "smuggle" (Collins 2005a, b) the *tough* subject.

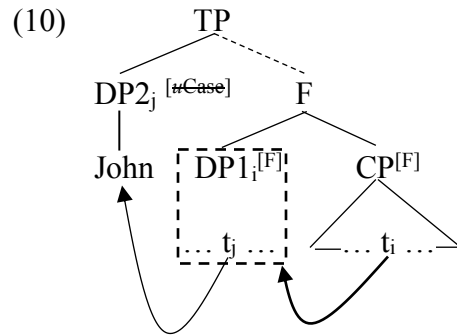


The PRO, then, moves into Spec, TP of the embedded clause, and the C is merged with [uQ] which is checked with [iQ] on the CNO while the [uWH] is checked as a reflex. The [EPP] on C then drives movement of the CNO into the phase-edge position, allowing the unchecked [uCase] on *John* to escape. At this point the remaining interpretable features in the CNO are now inactive. In other words, the phrase (i.e. the full CNO) is frozen in place and thus is not accessible to further movement, following Rizzi (2006, 2007), Bošković (2008c)⁸⁹.



⁸⁹ The details of the feature checking relations assumed by Hicks (2009) will actually not be important below.

Finally, when the main clause T merges into the structure, T, which has [$u\phi$], probes for [$i\phi$]. As a reflex of ϕ -agreement, a nominative case value is assigned to the goal *John*, which moves to Spec, TP to satisfy [EPP], and its [$uCase$] is checked.



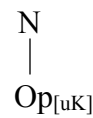
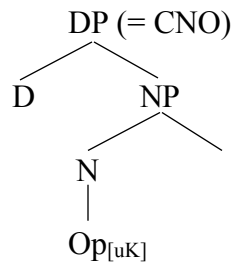
In short, based on this analysis, when the CNO merges with the V as an object, the patient θ -role is assigned to the whole complex DP1, and after the CNO merges with a CP, the inner DP2 is smuggled (Collins 2005a, b) into the matrix subject position without being assigned an accusative Case prior to that movement. The shared feature F is projected here (based on the Labeling Algorithm in Chomsky 2013), which I assume is a D-related feature. Assuming this CNO for DP languages where DP is crucially present (and needed for CNO), then, NP languages would not be able to have English like *tough* constructions since they lack DP. I will explore this prediction cross-linguistically below.

The CNO analysis above avoids the problems of the previous analyses in that (a) the CNO shields the *tough* subject from Case assignment in the lower clause by the infinitival verb, and that (b) it does not involve improper movement. Crucially, there has to be a DP which embeds Op within it, smuggling the *tough* subject from the complement position of the Op in (6).

An issue has to be clarified at this point though. I assume the Op itself in the *tough* construction does not have the [uK], unlike the Op in the clausal comparatives that we saw in the previous chapters.

(11) Null Operators in Comparatives

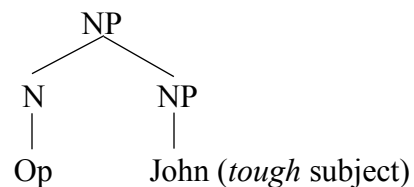
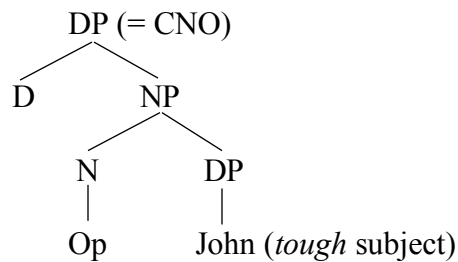
- a. DP-languages: Op = CNO b. NP-languages: Op = bare



In order to capture the difference, I suggest that bare Op has [uK] regardless of whether there is DP above it or not, but crucially, when Op takes a complement it has no [uK]. The Op still has no ϕ -features. Then there is no difference here between NP-languages and DP-languages except that with the latter, there is DP on top of the Op, as shown below.

(12) Null Operators in *tough* constructions

- a. DP-languages: b. NP-languages:



Thus, in NP-languages, the Op in *tough* constructions as in (12b), which does not have any uninterpretable features (i.e. hence no motivation for movement), cannot smuggle the subject *John*. In other words, DP is needed to perform the smuggling of the subject in *tough* constructions. Apart from the presence/absence of DP, all the properties of null Op are the same in DP-languages and NP-languages.

5.2. *Tough* Constructions without the CNO

5.2.1. Empty Pronoun

Japanese, an NP language, appears to allow *tough* constructions, as in (13). However, Takezawa (1987) claims that (13) should not be analyzed in accordance with the English *tough* construction (Chomsky 1977), as there is no island effect, which is shown by (14). (As the English translation here shows, (14) involves a complex NP configuration and should be ruled out due to movement out of the complex NP.)

(13) John_i-ga [_{AP} [_{S'} Op_i [_S PRO t_i yorokobase]] yasu -i]]

-Nom please easy –Pres

‘John is easy to please’

(14) a. [kono te-no hanzai]_i –ga (keisatu-nitotte) [_{NP} [_{S'} e_j e_i okasi-ta] ningen_j]-o

This kind of crime -Nom police-for commit-Pst man-Acc

sagasi-yasu-i

search-easy-Pres

'*[This kind of crime]_i is easy (for the police) to search [_{NP} a man [_S who committed *e_i*]]'

b. [kooitta itazura]_i-ga (senseigata-nitotte) [_{NP}[_S *e_j* *e_i* sita] seito_j]-o mituke-yasu-i

This-kind-of trick -Nom teachers-for do-Pst pupil-Acc find-easy-Pres

'*[This kind of trick]_i is easy (for the teachers) to find [_{NP} a pupil [_S who played *e_i*]]'

c. [Sooiu ronbun]_i -ga (watasi-nitotte) [_{NP}[_S *e_j* *e_i* kai-ta] gakusei_j]-o hyookasi-niku-i

That-kind-of paper -Nom me-for write-Pst student-Acc evaluate-difficult-Pres

'*[That kind of paper]_i is difficult (for me) to evaluate [_{NP} a student [_S who wrote *e_i*]]'

(Takezawa 1987, 203)

Takezawa explains this difference by claiming that Japanese *tough* sentences do not involve movement of Op but involve an empty pronominal (Japanese independently allows empty pronominals) in the gap position and the “aboutness relation” which correlates the pronominal and its antecedent, just as claimed for the derivation of relativization and topicalization by Saito (1985) based on Kuno’s (1973) observation. He further points out that when *tough* sentences have PP subjects, which cannot be coindexed with an empty pronominal, they observe Subjacency, as shown in (15). Thus, Takezawa concludes that only *tough* sentences with PP subjects must be derived by movement of a null operator as in their English counterparts.

(15) a. *[_{PP} Anna taipu -no zyosei-to]_i -ga (John-nitotte) [_{NP}[_S *e_j* *e_i* kekkon-site-i-ru]

That type of woman-with-Nom John-for marry-PRES

otoko_j]-to hanasi-niku-i

man-with talk-hard-PRES

(lit.) ‘[With that type of woman]_i is hard (for John) to talk to [_{NP} the man [_{S'} who marry _{e_i}]]

b. ?*[_{PP} Sooiu kin'yuukikan-kara]_i -ga (John-nitotte) [_{NP} [_{S'} _{e_j} itumo _{e_i} okane-o takusan

such financial agency-from -Nom John-for always money-Acc a lot

karite-i-ru] hito_j]-o sin'yoosi-niku-i

borrow- Pres person-Acc trust-hard-PRES

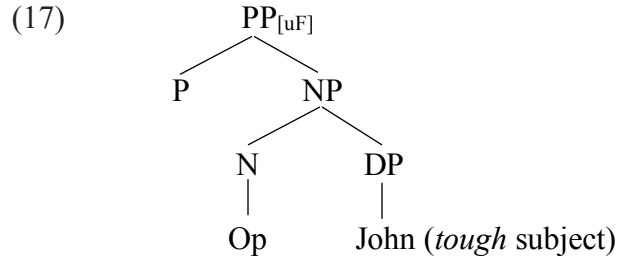
(lit.) ‘[From such a financial agency]_i is hard (for John) to trust [_{NP} a person [_{S'} who

always loans a lot of money _{t_i}]]’

I will argue that this PP subject *tough* construction is irrelevant to our expectation that NP languages do not have a *tough* construction since PP itself may bring in richer structure for the Op, enabling the smuggling of the subject, regardless of the presence of DP layer here.

(16) [Annna taipu –no zyosei-to]_j –ga [_{CP} [_{PP} Op _{t_j}]_i John-nitotte _{t_i} kekkon si yasui]

Thus, I will focus on nominal *tough* constructions where NP/DP distinction is crucial for the availability of *tough* construction, given the discussion in Section 4.1. Recall that the Op does not have any uninterpretable features in *tough* construction; a DP above the Op is necessary for smuggling the subject in DP-languages. The availability of *tough* construction with PP subject in Japanese then is explained by saying that PP functions as the DP and has an uninterpretable feature [uF] that is needed for the smuggling of the *tough* subject.



5.2.2. Non-nominative Subject

The necessity of the CNO analysis comes from the nominative Case marking on the *tough* subject in English. I.e. the subject needs to be smuggled into the TP spec position in order to avoid getting assigned the accusative Case in the complement position of the infinitive, instead getting the nominative Case from the higher T. If there are languages where the apparent subject of *tough* construction is assigned a Case other than nominative, CNO will then not be needed. I will therefore focus on nominative subjects of *tough* constructions below.

5.3. Cross-linguistic Survey of Availability of CNO in *tough*

5.3.1. Diagnostics

Before looking at the data, we need to clarify the diagnostics a little more. Regarding the Case marker of the *tough* subject, as noted above, it is crucial to check if it is a Nominative or another Case such as Accusative/Dative (or the Case normally assigned by the infinitive verb). If the matrix subject has a Nominative Case, then in that language the CNO can be involved in the derivation. However, there is another possibility when the language has no island effect (thus no *tough*-movement⁹⁰) because of a resumptive pronoun as in the case of Japanese *tough* sentences. If the *tough* subject has the Case assigned by the lower verb, it is an indication that the CNO analysis is

⁹⁰ I will often refer to the relevant movement as *tough* movement.

not necessary since there is no need for the subject to avoid Case assignment by being smuggled; this also suggests that the subject was base-generated in the object position of the infinitive, and moved to the surface position without any Op movement. There should, however, still be an island effect here⁹¹. The diagnostics are then summarized below.

(18) Diagnostics to follow

1. The subject has a nominative Case or a Case assigned by the embedded infinitive verb?
2. If nominative Case, then check subjacency effects; if yes, smuggling of the subject with the CNO as in (i); if no, base-generated subject with a null resumptive pronoun in the gap position without Op movement as in (ii).
 - (i) Subj(NOM)_j is tough [CNO ...t_j...]_i to please t_i e.g. English
 - (ii) Subj(NOM)_i is tough to please pro_i e.g. Japanese
3. If no nominative, with Case assigned by the infinitive verb, then the object of the infinitive verb is moved as in (iii) by e.g. focalization; and there is no need for Complex Op analysis, but there should be a subjacency effect for the movement.
 - (iii) Subj(DAT/ACC)_i is tough to please t_i

In order to check the subjacency effect, I will use the translation of Chomsky's (1977) examples regarding the locality in English *tough* sentences, i.e. (19c).

- (19) a. John_i is easy (for us) to please t_i
- b. (i) John_i is easy (for us) [to convince Bill [to do business with t_i]]

⁹¹ We could be dealing here either with quirky subject movement to Spec TP or movement of the object to a position above TP for topicalization/focalization. Either way, the movement does not result in Case assignment.

- (ii) John_i is easy (for us) [to convince Bill [that he should meet t_i]]
- c. (i) *John_i is easy (for us) [to describe to Bill [a plan [to assassinate t_i]]] (Complex NP)
- (ii) *Which sonatas_i are the violin_j easy [to play t_i on t_j] (Wh-island⁹²)

5.3.2. German⁹³

There are *tough* constructions with a nominative subject in several languages. Thus, the literature discusses the *tough* construction (also often referred to as the *easy-to-please* construction) in German or some Romance languages (e.g. see Montalbetti, Saito and Travis 1982; Cinque 1990a, 1990b; Roberts 1993; Wurmbrand 2001).

In German, (based on Wurmbrand 2001, Comrie and Mathew 1990, etc.), *tough* constructions have the subject that is nominative-marked but it is interpreted as an object of the infinitival verb as in (20a).

(20) a. Dieser Konflikt ist leicht zu lösen t_i

This.Nom conflict.Nom is easy to solve

‘This conflict is easy to solve’

b. Es ist leicht, diesen Konflikt zu lösen.

it is easy This.Acc conflict.Acc to solve

‘It is easy to solve this conflict.’

c. John hat den/diesen Konflikt gelöst.

⁹² Here, *which sonatas* is moving past a null *wh* operator (i.e. CNO in our analysis), resulting in a *wh*-island constraint violation.

(i) a. The violin_j is easy [CP [CNO Op t_j]_k ~~for~~ PRO to play sonatas on t_k].

b. *Which sonatas_i are the violin_j easy [CP [CNO Op t_j]_k ~~for~~ PRO to play t_i on t_k].

⁹³ German sentences in this subsection were checked by one consultant, Sabine Laszakovits.

John has the.Acc/this.Acc conflict.Acc solved

‘John solved the conflict.’

Here, crucially the verb *lösen* ‘solve’ used in the infinitival clause in (20b) and in the main clause in (20c) normally takes an accusative Case object, which means that the subject *dieser Konflikt* ‘this conflict’ in the *tough* construction in (20a) is not assigned a Case by the infinitival verb.

When an inherent Case assigning verb is used as the infinitive in *tough* constructions in German, however, the *tough* subject seems to retain the inherent Case from the infinitives, as shown below.

(21) a. Ihm ist leicht zu helfen

he.Dat is easy to help

‘He is easy to help.’

b. Es ist leicht, ihm zu helfen.

it is easy he.Dat to help

‘It is easy to help him.’

(22) Bitte hilf mir

Please help me.Dat

‘Please help me.’

Here I assume that the preverbal oblique NP *Ihm* ‘he.Dat’ is not a grammatical subject and thus not in spec TP position, following Zaenen et al. (1985), who show that German does not have quirky subjects. Thus, for example, the sentence-initial oblique NP in German passives cannot be

deleted under identity with a (nominative) subject, which is contrasted with the oblique NP in Icelandic, which has quirky subjects.

- (23) a. Er kam und (er) besuchte die Kinder. German
 he.Nom came and (he) visited the children
 b. Er kam und (er) wurde verhaftet.
 he came and (he) was arrested (Zaenen et al. 1985, 477)
 c. *Er kam und ____ wurde geholfen.
 He came and was helped

- (24) a. þeir fluttu líkið og þeir grófu það. Icelandic
 they.Nom moved the-corpse and they buried it
 b. þeir fluttu líkið og ____ grófu það
 c. Hann segist vera duglegur, en ____ finnst verkefnið of þungt.
 he.N says-self to-be diligent, but ____ .D finds the-homework too hard
 'He says he is diligent, but finds the homework too hard'
 (Zaenen et al. 1985, 453-454)

For this subjecthood test, the sentence-initial oblique DP in German *tough* sentence behaves similarly, which is contrasted with the nominative DP in (25) as shown below.

- (25) *Er hat überlebt und ____ war leicht zu helfen.
 he.Nom has survived and was easy to help
 'He survived and ____ was easy to help.'

(26) Dieser Konflikt verschlechtert sich und ___ ist schwierig zu lösen.⁹⁴

this.Nom conflict worsened refl and is difficult to solve

'This conflict worsened and is difficult to solve.'

Also, as in English, German *tough* sentences observe the island effect, as shown below (p.c. Sabine Laszakovits and Roman Reitschmied)⁹⁵.

(27) a. Es ist leicht den Plan zu beschreiben, John zu töten

It is easy the.ACC plan to describe John to kill

'It is easy to describe a plan to kill John'

b. *Der John ist leicht den Plan zu beschreiben, _ zu töten.

the.NOM john is easy the.ACC plan to kill to describe

'*John is easy (for us) to describe a plan to kill'

Therefore, German is categorized as type (i) in our diagnostic where the CNO movement is involved with the smuggling of the subject which gets nominative Case in the matrix TP specification. In other words, German has the relevant *tough* construction.

5.3.3. Spanish

⁹⁴ One can optionally insert *er* 'pronoun.Nom.Masc.Sg' as in:

(i) Dieser Konflikt verschlechtert sich und er ist schwierig zu lösen.

⁹⁵ Some previous literature points out that Op movement in German and some Romance languages here show a stricter locality effect when compared to their English counterparts (Kayne 1989, Roberts 1997, Wurmbrand 2001), an issue which I will not be concerned with here.

Spanish has a *tough* construction where apparently subject is marked as nominative (p.c. Gabriel Martínez Vera).

(28) *Ella es fácil de convencer*⁹⁶.

she.Nom is easy of convince

Here *Ella* ‘she’ is Case-marked with nominative, while the verb *convencer* ‘convince’ usually takes an object (convinced) with an accusative Case. Thus, the sentence can be paraphrased in the following way, with the accusative clitic *la* (3Person, Singular, Female).

(29) *Es fácil de convencerla*.

is easy of convince-her.ACC.

‘It is easy to convince her’

The following sentences show that there is an Island effect with *tough* construction in Spanish (p.c. Gabriel Martínez Vera).

(30) a. **A Juan es fácil (para nosotros) de describir a Bill el plan para asesinar*.

DOM Juan is easy for us of describe to Bill the plan for assassinate

⁹⁶ As noted by Montalbetti et al. (1982), the embedded infinitival predicate in Spanish *tough* construction is preceded by the preposition *de* ‘of’. They assume that infinitivals in Spanish *tough* constructions need Case, which *de* can assign. Topicalized version of *tough* sentences in Spanish does not require *de*.

(i) *A Juan es fácil (de) convencer*.

A-Juan is easy to-convince

‘Juan, it is easy to convince.’

They explain this by saying that *Juan*, being topicalized, does not get a Case from INFL, which can then assign the Case to the infinitival.

‘Intended: *John_i is easy (for us) [to describe to Bill [a plan [to assassinate t_i]]]’

b *¿Qué sonatas son fáciles en violín de tocar?

what sonatas are easy in violin of play

‘Intended: *Which sonatas_i are the violin_j easy [to play t_i on t_j]’

Thus, Spanish has the relevant *tough* construction, utilizing the CNO movement.

5.3.4. Italian

Italian has the similar *tough* sentences with nominative subjects, too. Some examples are shown below.

(31) a. Questo libro è difficile da finire prima di lunedì

this book is difficult to finish before Monday

'This book is difficult to finish before Monday'

(Wurmbrand 2001: 32)

b. Gianni è facile da accontentare.⁹⁷

John is easy C please.INF

‘John is easy to please’

c. L’orsacchiotto è facile da abbracciare.

The.teddy-bear is easy to hug

‘The teddybear is easy to hug.’

d. Questo libro è facile da leggere.

This book is easy to read

⁹⁷ Italian sentences in this subsection is checked by one informant, Roberto Petrosino.

‘This book is easy to read.’

As the following examples clearly show, the subject has to have a nominative Case marker in Italian *tough* sentences. Here a pronominal subject is used as the Case marking is reserved for personal pronouns in Italian.

(32) a. Io / *me sono facile da accontentare.

I.Nom / *I.Acc be.1sg easy to convince.Inf

‘I am easy to please.’

b. Io / *me sono difficile da convincere.

I.Nom / *I.Acc be.1sg difficult to convince

‘I am difficult to convince.’

Also, Italian *tough* sentences, as in (33), observes the island effect just as the ones in English/German/Spanish.

(33) a. *Lui_i è facile da mostrare a Bill [un piano per assassinare *t_i*].

She is easy to describe to Bill a plan to assassinate

‘Intended: *She is easy to describe to Bill a plan to assassinate’

b. È facile mostrare a Bill un piano per assassinare Maria.

is easy describe to Bill a plan to assassinate Mary

‘It is easy to describe to Bill a plan to assassinate Mary’

Italian then also has the relevant *tough* constructions, i.e. it falls into the type (i), with an Op movement which presumably smuggles the *tough* subject out of the object position of *convincere* ‘convince’ in (32).

5.3.5. French

Only pronouns have overt case markings in French as well. Thus, the following *tough* sentence does not tell us the Case of the matrix subject.

- (34) Ce genre de livre serait difficile à lire⁹⁸
this kind of book would-be difficult to read
'This kind of book would be difficult to read'

An example with an expletive used with “easy” is given in (35a) and its *tough* construction counterpart with a pronominal subject is given in (35b).

- (35) a. Il est facile de les satisfaire.
It is easy to 3Pl.Pro.ACC satisfy
'It is easy to satisfy them'
- b. Ils sont faciles à satisfaire.
3Pl.Pro.NOM are easy to satisfy.
'They are easy to satisfy'

⁹⁸ French examples in this subsection are checked by Alexandre Vaxman.

The pronominal subject here is nominative Case marked. Furthermore, the French *tough* sentence shows the Island effect, as illustrated below.

(36) a. *John_i (nous) est facile [de décrire à Bill [un projet [d’assassiner t_i]]]

John_i 1Pl.DAT is easy to describe to Bill a project to assassinate t_i

‘*John_i is easy (for us) [to describe to Bill [a plan [to assassinate t_i]]]’

b. Il (nous) est facile [de décrire à Bill [un projet [d’assassiner John]]]

it 1Pl.DAT is easy to describe to Bill a plan to assassinate John

‘It is easy (for us) to describe to Bill a plan to assassinate John’

(37) a. La sonate est facile à jouer sur ce violon.

The sonata is easy to play on this violin

‘The sonata_i is easy [to play t_i on this violin].’

b. *Sur quel violon est-elle la sonate facile à jouer?

On which violin is-3FemSg the sonata easy-Fem.Sg to play

‘*On which violin_j is the sonata_i easy [to play t_i t_j]?’

Thus, the French *tough* sentence is considered to be type (i), which is compatible with the CNO analysis.

5.3.6. Thai

I now turn to Thai⁹⁹. As shown below, there are morphemes *-gnai/-yak* ‘-easy/-difficult’ corresponding to Japanese *-yasui/-nikui* ‘-easy/-tough’.

(38) nang sue nian-yak.

book this read difficult.

‘This book is difficult to read’

(39) khao deejai-ngai.

he happy easy

‘he is easy to make happy’

Another similarity is that there is no island effect, as in its Japanese counterpart.

(40) achyakrrm ni jab [khon [ti tam t]] -ngai.

crime this arrest person who did easy

‘This (type of) crime is easy to arrest the person who did *t*.’

Also, Thai can have resumptive pronouns in e.g. relative clauses. A pronoun referring to the head noun may appear in some relative clauses. Here the resumptive pronoun /kháw/ is associated with the head nouns /khon/ and /nák-lian/.¹⁰⁰

(41) khon [thîi kháw pay yùu kan taam roṅrian]. (Iwasaki and Ingkaphirom 2005)

⁹⁹ Thai sentences are checked with two consultants, Panat Taranat and Sidney Mao.

¹⁰⁰ REC = reciprocal, SLP = Speech Level Particle

people C they go stay REC at school

‘People who want to stay at school...’

(42) mây-chây pen acaan kháp, pen náklían [thîi kháw fùk maa].

NEG is teacher SLP is student C they train come/ASP

‘(Dorm directors) are not teachers. They are students who have been trained.’

I assume the island effect is voided by the presence of a null resumptive pronoun in (40), which enables the aboutness relation between the fronted element and the gap, just as in the case of its Japanese counterpart.

Now, as the following sentences show, when a PP subject is used for the *tough* construction, the island effect is observed. This is another similarity with Japanese.

(43) a. ?? [jak tanakhan ni] waijai [khon [ti gu ngen yeu t_i]] yak.

from bank this trust person who loans money much hard

‘[from this bank] is hard to trust a person who loans a lot of money t_i’

b. waijai [khon [ti gu ngen yeu jak tanakhan ni]] yak.

trust person who loans money much from bank this hard

In short, Thai *tough* sentences pattern with Japanese, i.e. type (ii) in the diagnostics (18), in that there is no island effect despite the subject being nominative Case-marked, because of the existence of a null pronoun in the infinitival object position.

5.3.7. Bulgarian¹⁰¹

Unlike other languages discussed above, Bulgarian utilizes a subjunctive complement, as infinitive is rarely used in this language. The following sentences¹⁰² are examples of such construction (modified from Hill 2002, p. 508). Another difference is that there has to be a resumptive clitic (here *gi* ‘them.clitic’) when the object of the infinitive verb is fronted¹⁰³.

- (44) a. *trudno (mi) e da resha tezi problemi*
 tough.imp me.Dat be.3sg.pres subj solve these problems
 ‘It is tough (for me) to solve these problems’
- b. *Tezi problemi (mi) e trudno da gi resha*
 these problem.pl me.Dat be.3sg.pres tough.imp subj them.clitic solve
 ‘These problems, it is tough (for me) to solve them.’

Notice in (44a), there is a null expletive subject, which corresponds to English ‘it’. Notice also that the copular verb here does not agree with the fronted noun in (44b). This suggests that the fronting of the noun *tezi problemi* ‘these problems’ here is not to the TP spec position, but rather involves

¹⁰¹ All the Bulgarian data in this subsection are due to Vesela Simeonova.

¹⁰² An alternative construction in Bulgarian which can express the same meaning is shown below, where a deverbal nominal with a preposition *za* ‘for’ is used. I exclude this type of sentence from the discussion.

- (i) a. *Tezi problemi sa (mi) trudni za reshavane.*
 these problems.pl are 1sg.dat difficult for solving
 ‘these problems are difficult (for me) to solve.’
- b. *Toy e lesen za ubezhdavane.*
 He.Nom be.3sg.pres easy.masc.sg for convincing
 ‘He is easy to convince’

¹⁰³ Here the resumptive *gi* ‘them’ of the subject noun *tegi problemi* ‘these problems’ can be omitted only if there is a strong overt contrastive focus, as shown below, which indicates (44b) involves topicalization.

- (i) *TEZI PROBLEMI mi e trudno da gi resha, A NE onezi.*
 These problems 1sg.dat is difficult subj solve not those other ones
 ‘These problems are tough for me to solve, but not those (other) problems’

topicalization (see also footnote 103) as the English translation here shows. Using pronouns makes this clearer, as they can have Case marking in Bulgarian. The following sentences with a pronoun subject show that the relevant element is assigned accusative Case in the object position of the subjunctive verb, nominatives not being allowed.

(45) a. Nego e lesno da go ubedish.

Him.Acc be.3sg.pres easy da he.Acc.clitic convince

‘Him, it is easy to convince’

b. *Toy e lesno da go ubedish

He.Nom be.3sg.pres easy.masc.sg subj he.Acc.clitic convince.perf.2sg

‘Intended: He is easy to convince’

The topicalization of the object of the subjunctive verb shows the following locality restriction, i.e. it cannot be extracted out of an Island.

(46) a. * John ni e lesno da opishem na Bill plan da go kontrolira.

John us.Dat is easy.neuter subj describe to Bill plan subj he.Acc control.3sg

‘Intended: John is easy for us to describe to Bill a plan to control him’

b. Lesno ni e da opishem na Bill plan da kontrolira John.

easy.neuter us.Dat is subj describe.1pl to Bill plan.sg subj control.3sg John

‘It is easy for us to describe to Bill a plan to control John’

In conclusion, Bulgarian does not have the kind of *tough* construction we are interested in¹⁰⁴. More precisely, it is categorized into the type (iii) in the diagnostics (18).

5.3.8. Russian

As shown below, Russian¹⁰⁵ superficially has a *tough* construction. However, the element in the subject position cannot be marked nominative; it has the Case assigned by the embedded clause verb (dative in (47), and accusative in (48)).

(47) a. Ivan-u l'egk-o ugoditʃ.

Ivan.dat easy-adv please.inf

‘Ivan is easy to please.’

b. legk-o ugoditʃ Ivan-u

easy-adv please.inf Ivan-dat

‘It is easy to please Ivan’

(48) a. Vanʃu l'egko ub'editʃ

Ivan.masc.sg.acc easy.sf.sg convince.inf.pfv

‘Ivan is easy to convince’

b. petʃa ub'edil vanʃu

Peter.masc.sg.nom convince.pst.sg.masc Ivan.masc.sg.acc

‘Peter convinced Ivan.’

¹⁰⁴ This may have something to do with the complement of *tough* being a subjunctive, not an infinitive (in fact, in English, any embedding in a finite CP with the *tough* constructions leads to degradation, see Stowell 1986, Hattori 2017). I return to this issue below.

¹⁰⁵ Russian data are from two Russian consultants, Ksenia Bogomolets and Pavel Koval.

(49) a. *Ivan l'egko ugoditʃ.

Ivan.**nom** easy please.inf

‘Ivan is easy to please.’

b. *Ivan l'egko ub'editʃ.

Ivan.**nom** easy convince.inf

‘Ivan is easy to convince’

Therefore, the situation resembles the Bulgarian counterparts, where the fronted NP with non-nominative Case is actually topicalized/focalized. In any case, this suggests no involvement of Op according to the diagnostics in (18). In addition, the relevant fronting of the NP is island-sensitive.

(50) a. *Vanʃu (Pete) legko opisatʃ (Pete) plan

Ivan.masc.sg.acc Peter.masc.sg.dat easy.sf.sg describe.inf.pfv plan.masc.sg.nom/acc

ubitʃ

kill.inf.pfv

‘Intended: *Ivan_i is easy (for us) [to describe to Peter [a plan [to kill t_i]]]’

c. Legko opisatʃ Pete plan ubitʃ Vanʃu

‘It is easy [to describe to Peter [a plan [to kill Ivan]]]’

In conclusion, Russian does not involve the Op/CNO movement and is categorized into the type (iii) with the infinitive object movement.

5.3.9. Slovenian

Tough sentences are expressed in the following way in Slovenian¹⁰⁶. As in the case of Russian counterpart, the sentence-initial NPs get the Cases which the infinitival verb would assign (i.e. accusative in (51-52) and dative in (53)), and the nominative NPs are not possible as shown in (54). Note there is also no agreement between the NPs and the *tough* predicates in (51-53).

(51) a. {Ivana} je enostavno/lahko zadovoljiti {Ivana}.

Ivan.masc.**Acc** 3.aux easy.**Neut** please.inf Ivan.masc.**Acc**

‘Ivan is easy to please/It is easy to please Ivan.’

b. Novica je zadovoljila Ivana.

News.sg.f.Nom 3.aux please.f.3 Ivan.m.**Acc**

‘The news pleased Ivan.’

(52) a. {Petra} je enostavno/lahko prepričati {Petra}

Peter.**Acc** 3.aux easy.**Neut** convince Peter.**Acc**

‘Peter is easy to convince/It is easy to convince Peter.’

b. Ivan prepričal Petra.

Ivan.Nom convinced.masc.3 Peter.**Acc**

‘Ivan convinced Peter.’

(53) a. {Petru} je enostavno pomagati {Petru}

Peter.**Dat** 3.aux easy.**Neut** help.inf Peter.**Dat**

¹⁰⁶ Slovenian data in this subsection are checked by a consultant, Adrian Stegovec.

‘Peter is easy to help./It is easy to help Peter.’

b. Mary je pomagal Petru

Mary.Nom 3.aux help.pst.fem Peter.**Dat**

‘Mary helped Peter.’

(54) a. *Ivan je enostavno/lahko zadovoljiti.

Ivan.masc.**Nom** 3.aux easy.Neut please.inf

‘Intended: Ivan is easy to please.’

b. *Peter je enostavno/lahko prepričati.

Peter.**Nom** 3.aux easy.Neut convince

‘Intended: Peter is easy to convince.’

c. *Peter je enostavno pomagati.

Peter.**Nom** 3.aux easy.Neut help.inf

‘Intended: Peter is easy to help.’

This indicates we are dealing with topicalization/focalization here, which is also island-sensitive.

(55) a. *Ivana (nam) je lahko opisati Petru načrt ubiti.

Ivan.acc us.dat is easy describe.inf Peter.dat plan kill.inf

‘Intended: Ivan_i is easy (for us) [to describe to Peter [a plan [to kill t_i]]]’

b. ?? Je lahko opisati Petru načrt ubiti Ivana.¹⁰⁷

is easy describe.inf Peter.dat plan kill.inf Ivan.acc

¹⁰⁷ The sentence here in (55b) is already degraded since the sequence in which a noun is followed by an infinitive is dispreferred in Slovenian.

‘It is easy [to describe to Peter [a plan [to kill Ivan]]].’

In conclusion, Slovenian is categorized as type (iii) in the diagnostics; the complex Op is not involved in the *tough*-like sentences and the NP with the Case assigned by the infinitival verb is moved to the beginning of the sentence.

5.3.10. Polish

Polish patterns in the same way as Slovenian, superficially, (56-58) look like *tough* constructions.

(56) Ivana jest łatwo zadowolić

Ivana.Acc is easy to-please

‘Ivan is easy to please’

(57) Fabryką łatwo jest zarządzać.

Factory.INSTR easy is manage

‘This factory is easy to manage.’

(58) Jemu łatwo jest pomóc

He.Dat easy is to-help

‘He is easy to help’

However, crucially the sentence-initial NPs above are marked with the Case which would be assigned by the infinitive verbs in the object position, i.e. an accusative Case by *zadowolić* ‘please’,

a dative Case by *pomóc* ‘help’ and an instrumental Case by *zarządzać* ‘manage’ (Nominative NPs are not possible, i.e. (56-58) with nominative NPs are ungrammatical).

(59) a. Łatwo jest zadowolić Ivana

Easy is to please Ivana.Acc

‘(It) is easy to please Ivan.’

b. Wiadomości zadowoliły go/ Iwana

news pleased him.ACC/Ivan.ACC

‘The news pleased him/Ivan.’

(60) a. łatwo jest pomóc mu

easy is to-help he.Dat

‘It is easy to help him’

b. Jan pomógł mu

John helped him.Dat

‘John helped him.’

(61) a. łatwo jest zarządzać Fabryką .

easy is manage Factory.INSTR

‘It is easy to manage the factory.’

b. Jan zarządzał fabryką

John managed factory.INSTR

‘John managed the factory.’

This shows that the sentence-initial NPs in (56-58) are not actually the subject of the sentence, but are moved there from their base-generated infinitive object position for other purposes like topicalization. Also, the following examples show that the movement is island-sensitive.

(62) a. *Ivan_i łatwo jest [opisać Piotrowi [plan by zabił t_i]]

Ivan.Acc easy is describe Peter plan SUBJ to-kill

Intended: ‘*Ivan_i is easy (for us) [to describe to Peter [a plan [to kill t_i]]]

b. Łatwo jest opisać Piotrowi plan by zabił Iwana.

Easy is describe Peter plan SUBJ killed Ivan

‘It is easy [to describe to Peter [a plan [to kill Ivan]]]’

In sum, Polish counterparts of *tough* sentences do not involve the complex Op movement. Thus, Polish is categorized as type (iii) in the diagnostics (18).

5.3.11. Hungarian¹⁰⁸

In Hungarian, there is no English-like *tough* construction. As in Russian, the external argument that would be marked nominative (in English) is marked with the Case one would expect from the embedded infinitive predicate. The sentence with nominative subject is in fact ungrammatical.

¹⁰⁸ All the Hungarian data in this subsection are from a consultant, Éva Dékány.

(63) a. János-t könnyű meg-győz-ni¹⁰⁹

John-**acc** easy prt-convince-inf

‘John is easy to convince’

b. János-t nehéz szeret-ni

John-**acc** difficult love-inf

‘John is difficult to like’

c. János-nak könnyű hin-ni

John-**dat** easy believe-inf

‘John is easy to believe’

d. János-nak könnyű volt segít-eni

John-**dat** easy was help-inf

‘John was easy to help’

e. Ez-t a könyv-et könnyű olvas-ni.

this-**acc** the book-**acc** easy read-inf

‘This book is easy to read.’

(64) a. *János könnyű meg-győz-ni

John-**nom** easy prt-convince-inf

‘Intended: John is easy to convince.’

b. *Ez a könyv könnyű olvas-ni.

this-**nom** the book-**nom** easy read-inf

¹⁰⁹ The copula does not appear if the clause is indicative, present tense and the predicate is an adjective.

‘Intended: This book is easy to read.’

I take this to indicate that the movement in (63) involves topicalization/focalization, which is also island sensitive.

- (65) a. ??Könnyű nekünk leír-ni Bill-nek egy tervet János-t megöl-ni
easy for.us describe-inf Bill-dat a plan.acc John-acc assassinate-inf
‘It is easy for us to describe to Bill a plan to assassinate John’
- b. *[János-t]_i könnyű nekünk leír-ni Bill-nek egy tervet *t_i* megöl-ni
John-acc easy for.us describe-inf Bill-dat a plan.acc assassinate-inf
‘John is easy for us to describe to Bill a plan to assassinate’

In conclusion, Hungarian *tough* sentences do not involve the complex Op movement. The apparent *tough* sentence in this language involves topicalization/focalization of the direct object of the infinitive verb. Thus, Hungarian is categorized as type (iii) in the diagnostics (18).

5.3.12. Serbo-Croatian¹¹⁰

In examples corresponding to the *tough* construction in Serbo-Croatian (SC) in (66), the element in the apparent subject position has the Case which is assigned by the infinitival verb *ugoditi* ‘please’/ *otpuštiti* ‘fire’.

- (66) a. Njemu/*On je lako ugoditi.

¹¹⁰ Serbo-Croatian data in this subsection are from two consultants, Aida Talić and Ivana Jovović.

him.dat/he.nom is easy.adv please.inf

‘He is easy to please’

b. Njega/*On je lako otpustiti.

him.acc/he.nom is easy.adv fire.inf

‘He is easy to fire’

(67) a. Ivan je ugodio njemu.

Ivan is pleased him.dat

‘Ivan pleased him (but not her)’

b. Šef je otpustio njega.

boss is fired him.acc

‘The boss fired him (but not her)’

The pronouns can also be placed in the canonical object position as shown below, where the matrix subject is phonologically null.

(68) a. Lako je ugoditi njemu.

easy.adv is please him.dat

‘It is easy to please him (but not her)’

b. Lako je otpustiti njega

easy.adv is fire.inf him.acc

‘It is easy (for the boss) to fire him (but not her)’

All this suggests that in the “tough” constructions in (66), the sentence initial object of the infinitive verb undergoes topicalization/focalization/scrambling into the matrix clause, the real subject being null.

(66') a. Njemu_i [je lako ugoditi t_i]

him.dat is easy.adv please.inf

‘Him, it is easy to please’

b. Njega_i [je lako otpustiti t_i]

him.acc is easy.adv fire.inf

‘Him, it is easy to fire’

Furthermore, the movement of the object is island-sensitive, as shown below.

(69) a. Lako nam je Borisu prepričati trač da su ubili **njega**.

easy us.dat is Boris.dat retell gossip that are kill him.acc

‘It is easy for us to retell to Boris a gossip that they killed him.’

b. ***Njega**_i je nama lako Borisu prepričati trač da su ubili t_i.

Therefore, in Serbo-Croatian, the object moves directly from the complement of the infinitive without involving smuggling and CNO. In sum, the sentences that correspond to the *tough* constructions in SC are classified as type (iii) in the diagnostics (18), i.e. Serbo-Croatian does not have the relevant *tough* construction.

5.4. Conclusion

Based on the diagnostics (18), the *tough* constructions in the 13 languages we have discussed above are categorized into 3 types in the following way.

Languages	Types
English	i
German	i
Spanish	i
Italian	i
French	i
Bulgarian	iii
Hungarian	iii
Thai	ii
Japanese	ii
SC	iii
Slovenian	iii
Polish	iii
Russian	iii

Table 1: Types of *tough* constructions

As shown above, the type (i) “*tough*” constructions (where the CNO movement is involved) are available in a limited number of languages including English. Recall now that our prediction was that English-like *tough* constructions are available only in DP-languages based on the CNO analysis of *tough* constructions where the presence of the DP layer is crucial for the CNO to smuggle the *tough* subject. In this regard, the NP/DP distinction and the availability of the type (i) *tough* constructions in the languages under consideration are summarized in the following table.

Languages	DP/NP	<i>Tough</i> (i)
English	DP	Yes
German	DP	Yes
Spanish	DP	Yes
Italian	DP	Yes
French	DP	Yes
Bulgarian	DP	No
Hungarian	DP	No
Thai	NP	No
Japanese	NP	No
SC	NP	No
Slovenian	NP	No
Polish	NP	No
Russian	NP	No

Table 2: DP/NP distinction and availability of type (i) *tough* construction

Table 2 confirms that *tough* constructions are indeed allowed only in DP languages.

Finally, Table 3 takes into consideration the availability of type (i) *tough* construction with the complex Op-movement (according to the diagnostics discussed above), the NP/DP distinction, and the availability of DCC.

Lg. \ Para.	NP/DP	<i>Tough</i> (i)	DCC
English	DP	Yes	Yes
German	DP	Yes	Yes
Spanish	DP	Yes	Yes
Italian	DP	Yes	Yes
French	DP	Yes	Yes
Bulgarian	DP	No	Yes
Hungarian	DP	No	Yes
Thai	NP	No	No
Japanese	NP	No	No
SC	NP	No	No
Slovenian	NP	No	No
Polish	NP	No	No
Russian	NP	No	No

Table 3: NP/DP distinction and availability of *tough* construction and degree clausal comparatives

Here, we can establish a one way correlation, i.e. *tough* constructions with (Complex) Op movement and degree clausal comparatives with Complex Op are allowed only in DP languages. This is accounted for under the proposed analysis where only DP languages can have the complex null operator, which is needed for the derivation of *tough* constructions as well as degree clausal comparatives.

Recall now that the correlation between the availability of *tough* constructions and DP languages is a one way correlation, because of Hungarian or Bulgarian. A remaining question is, then what makes Hungarian and Bulgarian different among DP languages regarding the availability of *tough* constructions. I suggest here that other independent factors are involved. In the case of Bulgarian, its *tough* formation utilizes a subjunctive complement, as infinitive is rarely used in this language. Even in English, *tough*-formation movement is very local, i.e. it can only cross an infinitival clause but not a finite clause, which was pointed out by Stowell (1986).

- (70) a. *Betsy_i is easy [Op_i [PRO to expect [t_i fixed the car]]].
 b. *John is easy [Op_i [PRO to believe [t_i kissed Mary]]].
 c. ??This car is hard [Op_i [PRO to claim [[Betsy fixed t_i]]]].
 d. ??That language is impossible [Op_i [PRO to say [[Greg will learn t_i]]]].

(Stowell 1986: 477)

I suggest then that the movement across a subjunctive clause boundary in Bulgarian is prohibited in the same way, which blocks the possibility of the relevant *tough* constructions.

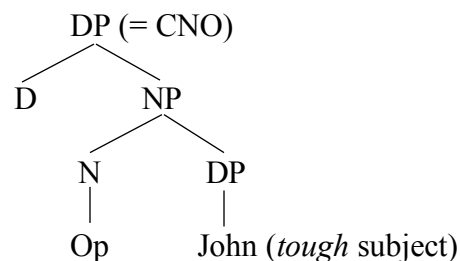
Turning now to Hungarian, it has been argued that the Op movement in *tough* constructions in some languages like German is more local than in English, in that it is not even allowed out of all infinitives (Wurmbrand 2001, Kayne 1989, Roberts 1997), more precisely it is allowed only out of “small” infinitives (i.e. restructuring). While I will not address the issue here, it is worth noting that it may be related to Hungarian. Kenesei (2005) and Dalmi (2004) argue that infinitival constructions in Hungarian project a full-fledged CP by pointing out that it has typical left peripheral projections with the strict order that is also found in finite clause. This property of

infinitival constructions in Hungarian may be the reason why *tough* construction is not allowed in Hungarian; *tough* formation movement may not be allowed to cross the Hungarian infinitive clause.

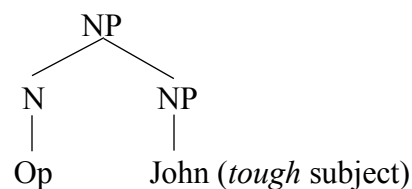
In conclusion, I have argued for the CNO analysis (Hicks 2009) of *tough* constructions in English, with smuggling of the nominative *tough* subject. This analysis resolves the problems of the previous analyses by blocking the *tough* subject from Case assignment in the infinitival clause, and it also avoids the Improper Movement issue. The smuggling of the *tough* subject is what resolves both issues¹¹¹. Crucially, for the smuggling to take place, there has to be a DP layer above a bare Op. Based on this, a prediction was made that *tough* constructions involving nominative subjects as well as Op movement will be possible only in DP languages. This prediction was borne out through a survey of 7 DP-languages and 6 NP-languages, which showed that *tough* constructions are indeed possible in only DP languages. Under the proposed analysis, the null Op does not have any uninterpretable features that would enable it to smuggle the *tough* subject. In DP languages, there is a DP above the null Op. It is this DP that smuggles the *tough* subject. The only difference between DP languages and NP languages is then that there is a DP above the null Op in DP languages, as shown in (12).

(12) Null Operators in *tough* constructions

a. DP-languages:



b. NP-languages:



¹¹¹ For another argument for the CNO/smuggling analysis of *tough* constructions, see Bošković (2018a).

The lack of (type (i)) *tough* constructions in NP languages was attributed to the inability of Op to smuggle the *tough* subject. It was also noted that Japanese and Thai, which are NP languages, have the relevant *tough* construction when its subject is a PP. This is captured under the proposed analysis because PP itself brings in a richer structure for the Op, enabling the smuggling of the subject, regardless of the presence of the DP layer.

Chapter 6

Acquisition of Complex Op by Parameter Setting

In this chapter, I will consider language acquisition by focusing on the setting of the parameter for two types of null operators discussed in the previous chapters. Specifically, I will focus on the availability of the complex Op based on the NP/DP distinction, where we saw that constructions like degree clausal comparatives (DCC) and *tough* construction must involve a complex Op with the DP layer. If children acquiring a DP-language need to set a parameter before they start using the complex Op with DP layer, then the constructions involving complex Op should be delayed. Based on this, I will investigate if the acquisition of DCC is in fact delayed in the acquisition of English (compared to that of Quantity Clausal Comparatives: QCC) through an experiment. Also, I will suggest that the acquisition of smuggling constructions, in particular English *tough* constructions, is also delayed and coincides with the timing of the acquisition of DCC.

6.1. Introduction

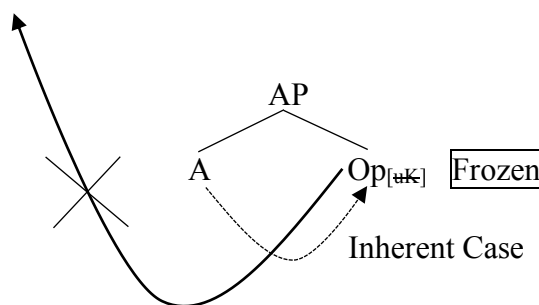
I claimed that cross-linguistic variation for the availability of DCC (and *tough* constructions) can be explained by a parameter as to whether Op can be complex or not in a language. Let us call this Complex Op parameter [\pm COp]. So, DP-languages (with DCC), e.g. English and German, will have the positive value for this parameter [$+$ COp], being able to have the Complex Op in the derivation of DCC, while NP-languages (without DCC), e.g. Japanese or Russian, will have the negative value for the parameter [$-$ COp], where only simple Op is available.

As discussed in the preceding Chapters, with the parametric view, it is correctly predicted that there is no language without degree-compared “phrasal” comparatives. We have seen that

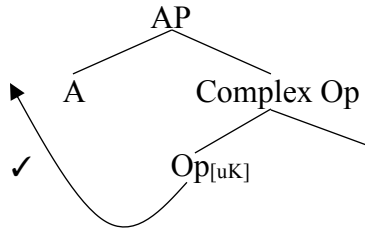
phrasal complement (as opposed to clausal complement) is always possible for *than*-equivalents, regardless of the quantity/degree distinction in all the languages we discussed in the previous Chapters. One possible analysis here would be to adopt a binary parametric view, i.e. “ \pm clausal” and “ \pm degree”. However, we may then expect that there could be a language with negative settings for both parameters, and thus allowing only quantity-compared phrases and no degree-compared phrases, but this is not the case.

I have argued that in a clausal comparative, Op moves to merge with CP and projects as a label in order to get its uninterpretable Case feature licensed through inherent Case assignment from *than*. In DCC, Op is base-generated in the complement position of A. Since the A head assigns inherent Case to its complement, simple Op in NP-languages gets frozen in place as in (1a), while DP-languages have a DP layer above the Op (hence Complex Op: COp), so the Op can still move out as a result of it, as shown in (1b). I argued that this is the reason why NP-languages disallow DCC.

(1) a. DCC in NP-languages



b. DCC in DP-languages



What is important here is that some languages have both QCC and DCC and some only have QCC. From the learnability point of view based on the Subset principle (Manzini and Wexler 1987), we may expect that English-learner should learn the QCC first and then switch to the more marked value [+COp], since s/he needs to figure out that complex Op is available in English before being able to comprehend/produce DCC, which is not necessary for QCC, where simple null Op can be used in the derivation (the underlying assumption here is that Op itself is universally available so there is nothing to learn there to comprehend/produce the QCC). The Subset Principle is a learning method for specifying a markedness hierarchy when alternative values yield languages which are in a subset relation. Suppose less marked value i of the parameter p yields a language $L(p(i))$ and more marked value j yields $L(p(j))$, where $L(p(i))$ is a strict subset of $L(p(j))$ as in Figure 1.

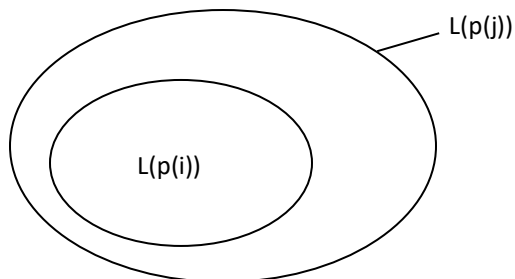


Figure 1: The Subset Principle

The subset relation here is crucial to overcome the learnability dilemma (Wexler and Hamburger 1973) that there is no way (given only positive data and no negative data) to correct an overgeneralization if the child ever picks a parameter setting which gives too large a language which is a superset of the correct target language s/he is learning.

Wexler and Manzini apply this principle to parameters associated with binding theory (Chomsky 1981). Under the theory, an anaphor e.g. *himself/herself* in English must be bound locally (binding principle A), where the anaphor is c-commanded by a co-indexed element in the same clause. On the other hand, an anaphor *zibun* 'self' in Japanese can be bound anywhere, i.e. non-locally bound. This is captured by saying that there is a "anaphor parameter" p , for which less marked value is i = (locally bound), and more marked value is j = (non-locally bound). The learner of Japanese, in this sense, assumes first that i is the correct value and then the learner will switch the value to j when s/he encounters positive evidence where the anaphor is bound non-locally (e.g. let w be an anaphor, *John_i thinks that Mary likes w_i*).

Now, based on the Subset Principle, the COp parameter p' will have less marked value - COp as i , which yields a language $L(p'(-COp))$, the language without DCC, and more marked value +COp as j , which yields $L(p'(COp))$, the language with DCC, where $L(p'(-COp))$ is a strict subset of $L(p'(COp))$ as in Figure 2.

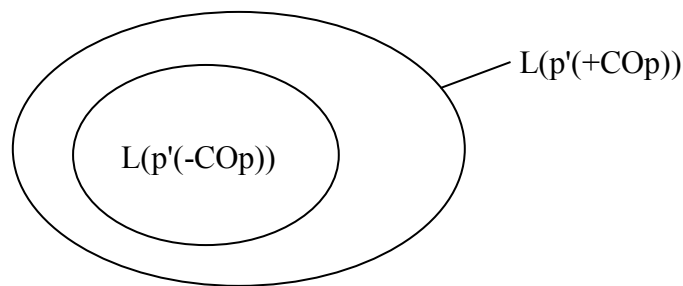


Figure 2: The Subset Principle and COp parameter p'

Therefore, a learner of a $L(p'(+COp))$ (i.e. DP-language) with DCC will start with the value $-COp$ and then switch the value to $+COp$ after getting positive evidence for DCC, while a learner of $L(p'(-COp))$ (i.e. NP-language) will stay with the choice $-COp$ since s/he does not get any positive evidence of DCC. This is illustrated in the Figure 3 below.

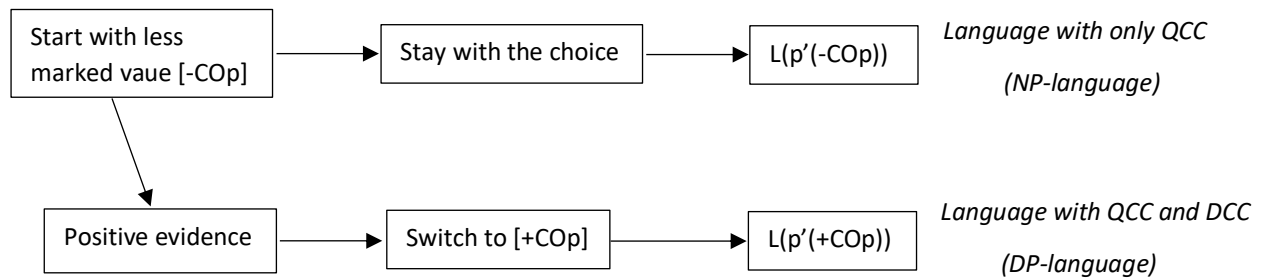


Figure 3: Learning process of COp parameter p'

Thus, it is predicted that a learner of English, which is $L(p'(+COp))$, would acquire QCC first when s/he has $L(p'(-COp))$ and then switch the value to $+COp$ after getting positive evidence from the language $L(p'(+COp))$ before s/he starts comprehending/producing DCC. In particular, for a comprehension task, then, the percentage of the correct answer of English-learning individual children (assuming that they are still in the process of switching the values) should be higher for QCC items than (or equal to) DCC counterparts. Based on this prediction, I will first review some previous studies (both production and comprehension) on acquisition of comparatives and point out some problems, and then propose a new study which avoids the problems from the previous studies. Finally, I will show that the prediction is in fact borne out based on the result of the study.

6.2. Previous Studies on Acquisition of Comparatives

6.2.1. Production

Regarding English-learning children's production of comparatives, Hohaus et al. (2014) found that production of phrasal type comparatives appears before that of their clausal counterparts ($p < .05$) in the utterance of an English learning child (Ross), based on corpus research using Child Language Data Exchange System (CHILDES; MacWhinney 2000). Here, Hohaus et al. take productions of attributive or adverbial comparatives as evidence for the child's knowledge of *than*-clauses in contrast with predicative comparatives, assuming that they are reduced from a clausal source (Lechner 2004, Bhatt & Takahashi 2011), because the $[-er]$ for predicative *than*-phrases in English as shown in (2b) cannot be used in the attributive/adverbial counterparts as in (3)/(4) as it would create an odd interpretation like comparing a computer with a person based on their speed.

(2) a. Mary is taller than John (Predicative Phrasal Comparative)

b. $[[-er]] = \lambda \text{Adj}_{\langle d, \langle e, t \rangle \rangle} . \lambda y . \lambda x . \max(\lambda d . \text{Adj}(d)(x)) > \max(\lambda d' . \text{Adj}(d')(y))$

c. $[[\text{Adj} -er \text{ than John }]] = \lambda x . \max(\lambda d . \text{Adj}(d)(x)) > \max(\lambda d' . \text{Adj}(d')(John))$

d. $[[\text{than John}]] = John$

(3) a. Mary owns a faster computer than Bill. (Attributive Phrasal Comparative)

b. $\# [[[\text{fast} -er] [\text{than Bill}]]] = \lambda x . \text{SPEED}(x) > \text{SPEED}(Bill)$

‘Mary owns a computer that is faster than Bill is.’

c. Mary owns a faster computer than Bill owns a d-fast computer

(4) a. Lilacs smell sweeter than these roses. (Adverbial Phrasal Comparative)

b. #[[[sweet -er] [than these roses]]] = λx . SWEETNESS(x) > SWEETNESS(these_roses)

‘Lilacs smell sweeter than these roses are sweet.’

c. Lilacs smell sweeter than these roses smell d-sweet

Hohous et al. (2014), however, did not include quantity-compared clausal comparatives in their study and focused on degree-type only.

In addition, I searched corpus data of 100 children (0 year and 8 months to 10 years old, 786 transcripts) on CHILDES for *than* complements. Total number of comparatives with *than* was 96, including 89 phrasal comparatives with no attributive type and 4 adverbial types, and 5 unambiguous clausal comparatives. Examples of utterances of comparatives are shown below.

(5) Phrasal Comparatives [n=89]

a. we're bigger than that guy (Trevor, 2 years; 8 months)

b. you're older than me (Carterette, 6;).

c. This is smaller than the big horse. (Peter, 2; 8)

d. No food is better than hairs. (Adam, 3; 5)

e.be bigger than my crib. (Eve, 2; 1) ...etc.

(6) Adverbial Phrasal Comparatives [n=4]

a. Winds go faster a lot faster than that sometimes. (Carterette, 10;)

b. Go faster than a bullet. (Adam, 4;2)

c. I like arithmetic better (1)than science that's for sure. (Carterette, 10;)

d. and my daddy can ice skate a little faster than me (Carterette, 6;)

(7) Unambiguous Clausal Comparatives [n=5]

- a. ...and um I've got a few grown up pictures of my um um person and and I have and they're all older than I am. (Carterette, 8;)
- b. he gets more on his plate and on the floor than he does in his mouth. (Carterette, 6;)
- c. and my little brother is my brother is younger than I am. (Carterette, 10;)
- d. and he gets better grades than I do. (Carterette, 10;)
- e. he's taller than I am. (Carterette, 10;)

As shown here, phrasal comparatives are produced by children of all age (from 2 to 10 years old) while clausal comparatives are produced only by older children over 4 years old. Looking at the clausal comparative utterances, 4 out of 5 instances are degree-compared. The quantity-clausal sentence in (7b), on the other hand, is produced by a younger child (6 years old). Thus, this might suggest that English-learning children at the younger age have difficulty producing degree-compared clausal comparatives; however, the size of the data being too small, it is not possible to draw firm conclusions here.

6.2.2. Comprehension

Townsend (1974) conducted an experiment on 72 English-learning children (3;5-5;4) to check their comprehension on several different kinds of comparative sentences including clausal comparative sentences with *more* and adjectives like *tall* or *wide*. In the experiment, children are introduced to three dolls with different height and width, which have different numbers of oranges and apples, and then answer questions like "Who has more oranges than Johnny has apples?" for

the quantity-clausal or “Which boy is taller than Bugs is fat?” for the degree-clausal comparative, by pointing or naming the doll. The percentage of correct responses by the younger group (3;5-4;4) were 61 for the degree clausal and 94 for the quantity clausal and by the Older group (4;5-5;4) were 44 and 61 respectively¹¹². The result, thus, suggests that the children are better at quantity-clausal than degree-clausal comparatives. This can mean that they are generally better at quantity-clausal than degree-clausal and also as children get older, they get better at degree-clausal. Thus this seems to be supporting the hypothesis that there is a parameter for quantity-clausal vs. degree-clausal. However, there are some problems with the experimental design.

Townsend and Erb (1975), using similar stimuli, did a follow-up experiment on children aged between 3 and 6 and found that they chose the largest object most often as an answer, indicating interpretation of only the first clause of the question, e.g. for ‘Which box is taller than it is wide?’, children have a tendency to interpret the sentence as ‘Which box is taller’ and thus to choose the tallest box in the array (let us call this “More=Most” interpretation). Looking at the test sentences and conditions of Townsend (1974), as shown below, we cannot distinguish the correct choice from the choice obtained through “More=Most” interpretation¹¹³.

(8) a. Quantity (# of apples, # of oranges)

B (0,3), C (0,1), J (2,2), “Who has more oranges than J has apples?”

b. Degree (height \times width)

B (2×6 in.), C (5×2 in.), G (7×2 in.), “Which boy is taller than B is fat?”

¹¹² No statistics test results were given for the difference between degree-clausal and quantity-clausal. Though, accuracy level expected by chance here is 50%, since children were asked to choose one of the two dolls.

¹¹³ Another concern here in (8b) is whether young children can understand the concept of measurement based on “inch,” e.g. one inch difference may be visually not clear enough for children to recognize.

For (8a), the correct answer would be B, but under the “More=Most” interpretation children would also choose B since B has the most oranges (i.e. 3). For (8b), in the same way, the “More=Most” interpretation makes children to choose G while the correct answer is also G. This is problematic especially because the experiment does not give us a clue to the reason of the children's choice, i.e. there is no "What really happened?" question as in the truth value judgment task (TVJT: Crain & McKee's 1985).

Snyder et al. (1995) conducted an experiment using the truth value judgment task (TVJT; Crain and McKee 1985) on 8 children (4;1-5;1, mean age 4;7), examining their comprehension of various clausal comparatives as in (9) (see Bresnan 1972, Chomsky 1977 for syntactic analysis of each type).

(9) a. 'Comparative Deletion'

John reads more books than Mary reads.

b. 'Subdeletion'

John reads more **books** than Mary reads **magazines**.

c. 'Subdeletion with Ellipsis'

John reads more books than John reads magazines.

Crucially in the study, they checked differences between noun (quantity) versus adjective (degree) comparison, and the result was that there is no significant difference between them (percentages correct: 54% vs 67%). The difference was, however, tested only with (full) comparative deletion, as shown in (10).

(10) a. The troll has more soap than Homer *has*.

b. The troll is bigger than Homer *is*.

The problem is that children could comprehend the sentences as phrasal comparatives, ignoring the last word of the sentences, and still can judge the truth value of the sentences with the correct answer. Thus, due to the test sentences, the experiment cannot confirm if children can comprehend degree-clausal comparatives.

6.3. The New Experiment

To avoid the problems above, I have conducted a similar TVJT experiment (following Snyder et al. 1995), but with unambiguously clausal comparatives (both quantity and degree) using the subcomparatives, where ignoring the last part and comprehending them as phrasal comparatives would change the truth value of the sentences, cf (10).

(11) a. John has more apples than Bill *has oranges*

b. John is taller than Bill *is fat*

For example, here ignoring the last part of the sentence would mean comparison between the number of apples that John has and the number of apples (instead of oranges) that Bill has for (11a). (11b) would be a comparison between John and Bill on the scale of only tallness instead of two scales i.e. tallness of John and fatness of Bill.

6.3.1. Subjects and Procedure

23 subjects at 4 daycare centers were tested (3;03-5;10, mean age=4;03). Prior to testing children, 10 adult subjects (undergraduate students at University of Connecticut) were tested for control with the same procedure and materials. Slightly modified version of the TVJT was used. Instead of an experimenter acting out the stories with toys and props, stories were presented as animation on a tablet screen narrated by one of the experimenters. After each story, Cookie monster the puppet acted by another experimenter say 3-4 test sentences about the story. The subjects were asked to give a cookie to the puppet when he was right or order him to do push-ups when he was wrong. When the child told the puppet to do push-ups, the experimenter asks why he was wrong.

6.3.2. Materials

The study includes 1 practice story and 7 test stories with 3-4 target sentences each. Since the stories involves comparing certain number (up to 5) of objects, it is crucial that children have relevant knowledge about numbers to complete the task. Thus, pre-experiment tasks, as shown below, are included prior to the study to verify that the children can count a set of 5 objects and understand the concept of number (see Carey 2009, 2011).

(12) a. Pre-test A (counting):

Experimenter: Let's see if you can count these cookies (toys) here.

Child: one, two, three, four, five.

b. Pre-test B (concept of number):

Experimenter: Can you give me one cookie out of the box?

Child: (takes one cookie out of the box)

Experimenter: Now, cookie monster here loves cookies. Can you get five out of the box for him?

Child: (takes five cookies out of box)

The sample stories and the test sentence uttered by *Cookie Monster* (CM) the puppet are shown below. The picture on the left shows the final image/slide of the story the child would look at when CM utters the test sentences.

(13) Story for quantity subcomparatives:

Frog - (3) bugs, (2) rocks; Smurf – (1) bugs, (4) rocks

Frog: "Oh, look at these great bugs I found. I love to collect bugs and keep them.

I found one, two, three bugs. What did you find, Smurf?"

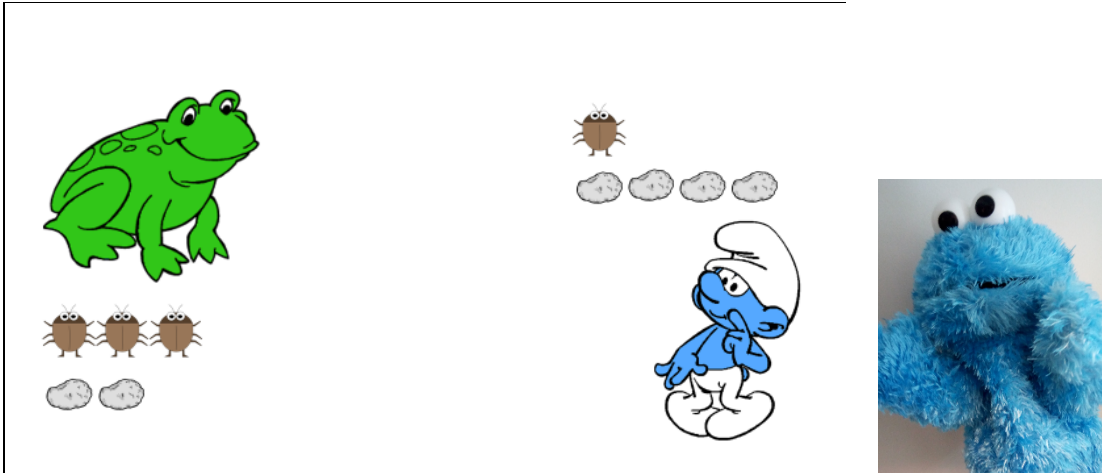
Smurf: "Bugs are okay. I found only one bug here but I love rocks.

I found one, two, three, four excellent rocks."

Frog: "Oh I have some Rocks too. See, I found one two rocks.

But I'd rather play with my bugs."

CM: Oh, I know. The frog found more bugs than Smurf found rocks. (0)



(14) Story for degree subcomparatives:

Girl – 5 bricks high × 3 bricks wide wall; Boy – 2 bricks tall × 4 bricks wide wall¹¹⁴

Experimenter: “A girl and a boy made walls out of blocks. Their walls are different.

This one is very ‘tall’, but that one is very ‘wide’ ”

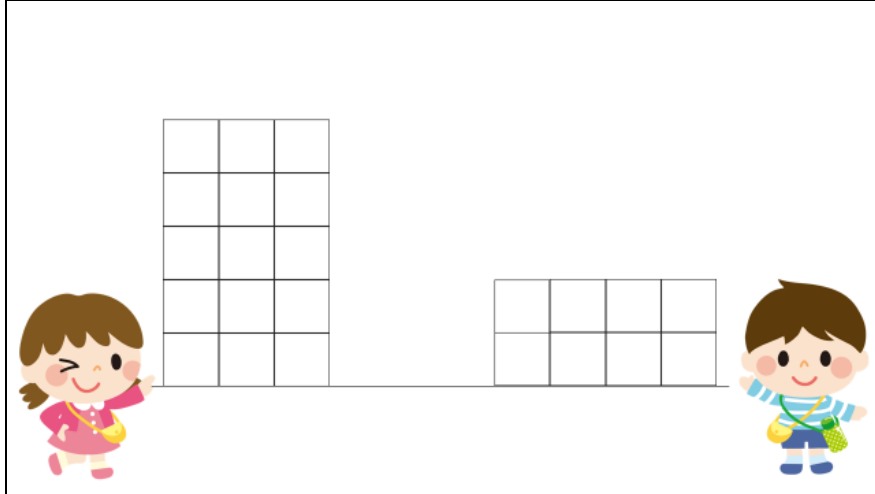
Girl: “Look at my wall! I made it all by myself. It is ... (count to 5) this tall. Isn't it great!”

Boy: “That's a really tall wall. My wall isn't that tall but it is really wide wall, see?

It's ... (count to 4) this wide!”

CM: “So, the boy's wall is wider than the girl's wall is tall?” (0)

¹¹⁴ Here, avoiding the abstract measurement like *inch*, I use number of bricks to show the height or width of the objects, which are compared.



In both cases, the correct answers correspond to negative answer. If the subject child has the adult grammar (quantity/degree clausal comparatives), I expect that they will answer with “no” to *CM* (and should be able to explain after they are asked “what really happened?”). On the other hand, if they don’t have the adult grammar, they would disregard the second clause in the test sentences and interpret them as phrasal comparatives as shown below, thus answer with “yes.”

(13') *The frog found more bugs than [DP Smurf] ~~has rocks~~.* (1)

(14') *The boy's wall is wider than [DP the girl's wall] ~~is tall~~.* (1)

Therefore, the new experiment gives a novel and more accurate evidence for the difference in children’s comprehension between quantity-clausal and degree-clausal comparatives by avoiding the problem of the previous study (Snyder et al. 1995). Also, the conceptual paraphrase items¹¹⁵,

¹¹⁵ Snyder (1995) argues that some children cannot understand subcomparatives because their conceptual understanding of dual-dimensional comparison is missing.

as shown below, are included, in order to see if children's difficulty on degree subcomparatives is caused by their comprehension of the concept outside of their grammatical knowledge.

(15) a. Degree Subcomparatives

The Green friend is taller than [_{CP} the Orange friend is fat]

b. Conceptual paraphrase of (a)

The tallness of the Green friend is more than [_{DP} the fatness of the Orange friend]

Furthermore, following Hohaus et al. (2014), I included attributive and adverbial comparatives to see the child's knowledge of degree *than*-clauses, assuming that they can be reduced from clausal sources (Lechner 2004, Bhatt & Takahashi 2011).

(16) a. Pooh built a taller tower than Piglet. (Attributive Phrasal Comparative)

b. Clausal reading: *Pooh built a taller tower than Piglet ~~built a d-tall tower~~*

‘Pooh built a taller tower that is taller than the tower Piglet built’

c. Phrasal reading: *Pooh built a taller tower than Piglet*

‘Pooh built a tower that is taller than the height of Piglet’

(17) a. Pooh jumps higher than Piglet. (Adverbial Phrasal Comparative)

b. Clausal reading: *Pooh jumps higher than Piglet jumps d high*

‘Pooh jumps higher than the height Piglet jumps’

c. Phrasal reading: *Pooh jumps higher than Piglet*

‘Pooh jumps higher than the height of Piglet’

Here, in certain contexts, notice that attributive/adverbial comparatives are ambiguous between clausal and phrasal readings. Thus, it is of interest to see if the child can access the clausal reading or not in such contexts.

6.3.3. Predictions

Based on the hypothesis that there is the COp parameter p' for quantity/degree clausal comparatives in terms of the Subset Principle as we saw in Figure 2 and 3, it is predicted that the percentage of the correct answer of individual children will be higher for the quantity-clausal items than degree-clausal counterparts (to be statistically tested, using a Wilcoxon signed-rank test)¹¹⁶.

Now, the other parametric proposals in the literature, e.g. Beck, Oda and Sugisaki 2004, Beck et al. 2009, make a different kind of prediction. Based on the standard semantic analysis of comparison (Heim 2001, von Stechow 1984), English clausal comparatives or subcomparatives with degrees as in (18) involve abstraction over degree, i.e. as shown below, the matrix and *than*-clause provide sets of degrees through abstraction over a degree variable.

(18) a. This shelf is taller than that door is wide.

b. [[Degree Phrase -er [than how₁ this shelf is t_1 tall]] [2 [that door is [AP t_2 wide]]]]

c. [[[<_{d,t}> 2 [this shelf is [AP t_2 tall]]]]] = [λd . **this shelf is d-tall**]

d. [[[<_{d,t}> how₁ that door is t_1 wide]]] = [λd . **that door is d-wide**]

e. [[[Degree Phrase -er than [<_{d,t}> how₁ this shelf is t_1 tall]] [<_{d,t}> 2 [that door is [AP t_2 wide]]]]]

¹¹⁶ Strictly speaking, the theory predicts that the correct percentage of degree-clausal should be 0% before the children switch the value of the parameter p' ; however, the experimental prediction has to be somewhat weaker as there are possibilities that they answer in/correctly by chance for processing reasons.

= 1 iff $\max(\lambda d. \text{This shelf is } d\text{-tall}) > \max(\lambda d'. \text{that door is } d\text{-wide})$

f. ‘The maximal height degree that this shelf reaches is more than the maximal degree of width that that door reaches.’

(19) $[[-er]] = \lambda D. \lambda D'. \max(D') > \max(D)$ (type $\langle\langle d, t \rangle, \langle\langle d, t \rangle, t \rangle\rangle$)

$\max(D) = \lambda d: D(d) \ \& \ \forall d' [D(d') \rightarrow d' \leq d]$

As we saw in the chapter 3, clausal comparatives with degrees are not allowed in Japanese; Beck et al. (2004) observe that there is no subcomparatives with degrees in Japanese while the subcomparatives with quantity is possible.

(20) a. *Kono tana-wa [ano doa-ga hiroi yori (mo)] (motto) takai.

this shelf-top [that door-nom wide yori (mo)] (more) tall

b. This shelf is taller than that door is wide.

(21) a. Taro-ga hon-o katta yori hanako-wa takusan zassi -o utta.

Taro-Nom book-Acc bought than hanako-Top many magazine -Acc sold

b. Taro bought more books than hanako sold magazines.

Recall that Beck et al. (2004) explains this difference by implementing the following parameter.

(22) Degree Abstraction Parameter (DAP):

A language { does/does not } have binding of degree variables in the syntax

They claim that Japanese has negative setting for the DAP, and thus there is no abstraction over degree variables in the syntax at all.

In English, besides comparatives, constructions that have been argued to involve abstraction over degrees include direct measure phrases or degree questions, equatives, superlatives, and constructions with *too*, *enough* and *so that* (see Beck et al. 2009, Hohaus et al. 2014). For example, semantics of overt measure phrase construction and degree questions are shown below.

(23) a. John is exactly 1.70m tall.

b. ‘The maximal height degree that John reaches is 1.70m.’

c. [[Degree Phrase <<d,t>,t> exactly 1.70m] [<d,t> 1 [John is t₁ tall]]]

(24) a. How old is Mary?

b. ‘For which degree d: Mary is d-old?’

c. [Q [<d,t> [Degree Phrase how₁] [Mary is t₁ old]]]

In fact, in Japanese, these constructions are not available, and this is explained by [-DAP] setting in this language, according to Beck et al. (2004).

(25) a. Sally-wa 5 cm se-ga takai.

Sally-Top 5 cm back-Nom tall

‘Sally is 5cm taller/*Sally is 5cm tall.’

b. Sally-wa Joe-yori 5 cm se-ga takai.

Sally-top Joe-yori 5 cm back-nom tall

‘Sally is 5cm taller than Joe.’

(26) a. John-wa dore-kurai kasikoi no?

John-top which degree smart q

‘To which degree is John smart?’

b. How smart is John?

A prediction based on this type of parametric proposal is that as an English learning child sets [+DAP], s/he should be able to comprehend other constructions which involve the degree abstraction as well as degree clausal comparatives. In other words, children's performance on subcomparatives of degree should be closely related to their performance on measure phrases. This is not predicted by my hypothesis based on the Subset Principle. Thus, it is of interest to check this by including test items as shown below in the experiment.¹¹⁷

(27) a. CM *"I know how tall the girl's wall is. It's 3 bricks tall."* (0)

b. CM *"I know how wide the boy's wall is. It's 4 bricks wide."* (1)

¹¹⁷ Arai et al. (2014, 2017) show that children have a tendency to mix up the measure phrase with differential comparatives, e.g. *It's 3 bricks taller* for *It's 3 bricks tall*.

6.3.4 Results

In order to be included in the data analysis, the children needed to satisfy all of the following inclusion criteria:

- (28) a. If the child pass the pretest (counting and concept of number)
- b. If the child answered at least 70% of the test items.
- c. If the child did not exhibit an obvious response bias i.e. “yes/no” to all of the items.
- d. Monolingual or nearly monolingual (input: 95% or above) of English

Based on this, 15 out of 23 children’s data is included for analysis (3;03-5;10, mean age = 4;05). The following Table 4 shows Percentage Correct of each item, i.e. Quantity-clausal comparatives (Q-C), Paraphrase of the subcomparatives (Paraph), Degree-clausal comparatives (D-C), and Overt Measure Phrase (MP) per child. This is contrasted with adult control data as shown in Table 5, which shows average of percentage correct (10 adult subjects)¹¹⁸. This indicates that adults demonstrated near-ceiling performance on all of the test items.

¹¹⁸ An adult speaker, however, noted that processing DCC is somewhat more difficult compared to QCC. This needs to be checked in the future research by measuring reading/reaction time.

	Age	Q-C	Paraph	D-C	MP
1	4;2	66.7%	66.7%	66.7%	40.0%
2	4;7	83.3%	100.0%	66.7%	100.0%
3	5;1	50.0%	40.0%	33.3%	0.0%
4	4;7	25.0%	75.0%	20.0%	66.7%
5	4;8	66.7%	40.0%	66.7%	20.0%
6	4;9	66.7%	80.0%	33.3%	40.0%
7	4;1	100.0%	60.0%	33.3%	20.0%
8	3;11	83.3%	80.0%	83.3%	60.0%
9	3;8	50.0%	50.0%	33.3%	50.0%
10	5;4	33.3%	60.0%	50.0%	60.0%
11	4;1	83.3%	20.0%	0.0%	80.0%
12	4;8	83.3%	100.0%	66.7%	60.0%
13	3;3	50.0%	40.0%	33.3%	20.0%
14	3;8	50.0%	40.0%	33.3%	60.0%
15	5;10	50.0%	20.0%	50.0%	40.0%

Table 1

Q-C	100%
Paraph	100%
D-C	98%
MP	100%

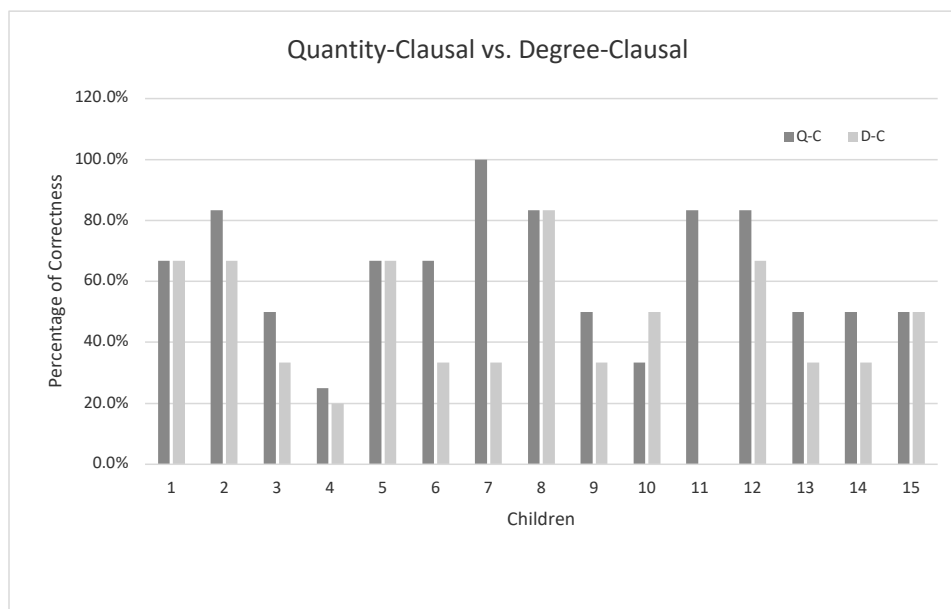
Table 2

The first prediction from the previous subsection, based on the hypothesis that there is parameter p' for complexity of null Op (Complex Op parameter [\pm COp]) involved in clausal comparatives in terms of the Subset principle is that the percentage of the correct answer of individual children is higher for the quantity-clausal items than (or equal to) degree-clausal counterparts:

(29) Percentage of Correct Responses:

Quantity-Clausal Comparatives (QCC) \geq Degree-Clausal Comparatives (DCC)

As the following Graph 1 and Table 6 shows, there is in fact a general directionality between the two values.



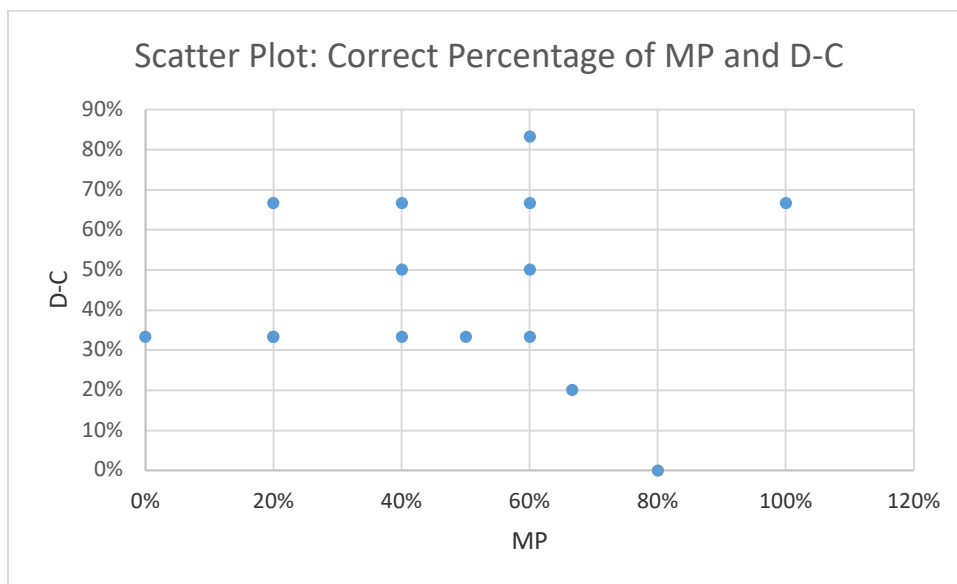
Graph 1

Average Percentages of Correct Answer	
Q-C	61.1%
D-C	45.9%

Table 3

The directionality was statistically significant by Wilcoxon signed-rank test ($n_{s/r} = 11$, $W = 54$, $Z = 2.38$, two-tailed $p = .0173$).

The second prediction from the previous subsection, based on the DAP (Beck et al. 2004) was that children's performance on clausal comparatives of degree should be closely related to their performance on measure phrases. The following Graph 2 shows a scatter plot of correct percentages between clausal degree comparatives and measure phrases, which suggests that there is no strong correlation between the two values.



Graph 2

Correlation between MP and D-C, with performance of MP being the predictor (X) for the performance of D-C (Y) is statistically tested. By Pearson's correlation test; it was not significant ($r^2 = 0.002^{119}$, $t(13) = .145$, two-tailed $p = .8868$), and by Spearman's Rank-Order correlation test; it was not significant ($r_s = -0.0047$, $t(13) = -0.02$, two-tailed $p = .9843$). However, we need to take

¹¹⁹ Only 0.2% of variant is explained by the correlation

into account the syntactic complexity of the D-C, i.e. performance on D-C could be limited by conceptual ability outside of grammatical ability. Thus, performance (percentage correct) on conceptual paraphrase items of the D-C was taken into account by partial regression procedure (an example of the paraphrase is shown below again).

(30) a. Degree Subcomparatives

The Green friend is taller than [_{CP} the Orange friend is fat]

b. Conceptual paraphrase of (a)

The tallness of the Green friend is more than [_{DP} the fatness of the Orange friend]

First, the percentage correct on paraphrase (X) is used as a way of predicting the performance on D-C (Y). Then, another regression test was conducted to see if the residuals of the paraphrase and D-C above (Y) is predictable by the performance on MP (X). The result was not significant ($r^2 = .036$, $t(13) = -0.692$, two-tailed $p = .501$) by Pearson's regression test. By Spearman's Rank-order correlation test, it was not significant ($r_s = -0.1741$, $t(13) = -0.64$, two-tailed $p = .533$), either.

6.4. Discussion

6.4.1. Implication for Theory of Parameter Involved in Comparatives

The result of the study supports the parametric view on cross-linguistic variation in comparatives based on the Subset Principle, where I proposed that there is a parameter p regarding the availability of complex null Op ($[\pm\text{COp}]$), for which less marked value i is $[-\text{COp}]$ which yields a subset language without DCC, while more marked value j is $[\text{+COp}]$ which yields a language with

DCC. The result shows that children seem to learn QCC first, and then DCC after they get positive evidence for the latter.

On the other hand, the study failed to provide support for Beck et al.'s parametric view on degree comparatives based on the degree-abstraction parameter. No correlation between children's performance on degree clausal comparatives and measure phrases was found. However, there are other possibilities. For example, there could be additional grammatical decision in addition to the degree-abstraction that children have to make or they must obtain lexical understanding of adjective/measurable quantity of entities to master the degree-clausal comparatives.

6.4.2. Exclusion by the Performance on Paraphrase Items

Since comprehension of subcomparatives requires processing the two-dimensional comparison, it can be said that correctly answering the paraphrase items is prerequisite for correctly comprehending the Q-C or D-C items. Under this consideration, subjects who had 49% or lower correct percentage on paraphrase items are additionally excluded and the remaining data (as shown in Table 6) was tested against the two predictions above again.

	Age	Q-C	Paraph	D-C	MP
1	4;2	66.7%	66.7%	66.7%	40.0%
2	4;7	83.3%	100.0%	66.7%	100.0%
4	4;7	25.0%	75.0%	20.0%	66.7%
6	4;9	66.7%	80.0%	33.3%	40.0%
7	4;1	100.0%	60.0%	33.3%	20.0%
8	3;11	83.3%	80.0%	83.3%	60.0%
9	3;8	50.0%	50.0%	33.3%	50.0%
10	5;4	33.3%	60.0%	50.0%	60.0%
12	4;8	83.3%	100.0%	66.7%	60.0%

Table 4

The ordering between Q-C and D-C items, i.e. Quantity-Clausal \geq Degree-Clausal, was insignificant¹²⁰ by Wilcoxon Signed-Rank Test ($W=19$, $n_{s/r}=7$). This is probably due to the smaller set of data. For the correlation between MP and D-C, it was insignificant¹²¹ by Spearman's correlation test ($r_s=0.2115$), though the r_s value is bigger.

6.4.3. Age Effect

Here I will discuss whether the age is an important factor for their performance. Children's data (table 4) is reordered by age in Table 8. There is no strong correlation between age (as the predictor) and correct percentages of Q-C (two-tailed $p=.51$), Paraph (two-tailed $p=.85$) and D-C items (two-tailed $p=.46$) by Spearman's Rank order correlation test, respectively.

¹²⁰ Based on table of critical values of $\pm W$

¹²¹ Based on table of critical values of r_s . Since the number here is less than 10, t value is not a good approximation of the sampling distribution of r_s .

	Age	Q-C	Paraph	D-C	MP
13	3;3	50.0%	40.0%	33.3%	20.0%
9	3;8	50.0%	50.0%	33.3%	50.0%
14	3;8	50.0%	40.0%	33.3%	60.0%
8	3;11	83.3%	80.0%	83.3%	60.0%
7	4;1	100.0%	60.0%	33.3%	20.0%
11	4;1	83.3%	20.0%	0.0%	80.0%
1	4;2	66.7%	66.7%	66.7%	40.0%
2	4;7	83.3%	100.0%	66.7%	100.0%
4	4;7	25.0%	75.0%	20.0%	66.7%
5	4;8	66.7%	40.0%	66.7%	20.0%
12	4;8	83.3%	100.0%	66.7%	60.0%
6	4;9	66.7%	80.0%	33.3%	40.0%
3	5;1	50.0%	40.0%	33.3%	0.0%
10	5;4	33.3%	60.0%	50.0%	60.0%
15	5;10	50.0%	20.0%	50.0%	40.0%

Table 5

This shows that age is not a good predictor for children's performance on clausal comparatives or their paraphrases. This is compatible with the Subset Principle, if English learning children need to receive a large volume of input before they can change the value of the phrasal/clausal parameter from *i* (phrasal) to *j* (clausal), and start comprehending clausal comparatives.

6.4.4. Direction of Future Research

It should be pointed out that only one child (no. 7) in Table 5 showed fully adult-like performance (100% correct) on QCC; overall performance of the children was only a little better than chance level. What is predicted by my parametric view ($[\pm\text{COP}]$) is, however, that all the children should

show adult-like performance on QCC and the correct percentage of DCC should be 0% before they set the parameter to [+COp] and 100% after they set it. In this sense, we must say that the result is suggestive, though not conclusive. I suggest here that the overall low performance by children might be caused by processing difficulties on the TVJT task itself or due to an additional unset parameter which is necessary for comprehending clausal comparatives. It is hard to tease apart these issues based on the available data, and thus, I leave this as an open issue for future research.

6.5. Acquisition of Other Constructions Involving the CNO

6.5.1. *Tough* Constructions

One question that arises concerns acquisition of *tough* construction. A possible prediction based on the parameter [\pm COp] is that there should be a correlation between the timing of *tough* construction acquisition and DCC acquisition, assuming there is the same complex Op involved in both. In other words, English learning children with [+COp] setting should perform well both on *tough* construction and DCC, while children that still have [-COp] setting should perform poorly both on *tough* construction and DCC, on the other hand.

Previous research on first language acquisition of *tough* construction shows that Children err in their interpretation of *tough* constructions until quite late in development, i.e. around age 6 to 10 years (C. Chomsky 1969, Cromer 1970, Anderson 2002, 2005, Becker et al. 2012, i.a.). In particular, children give at best inconsistent interpretations, and at worst consistently incorrect interpretations, until age 5 or 6 years (Anderson 2005). In particular, the children construe the subject of the sentence as the semantic subject of the lower predicate, as shown below.

(31) The girl is easy/tough to see \rightarrow ‘it is easy/tough for the girl to see someone else’

For example, Anderson (2005) conducted the TVJT study on 44 children (3;4-7;5) and found that 70.5% of the children gave a non-adult like interpretation of the *tough* sentences shown above. In the task, the child and a puppet watches an experimenter telling a short story with toys. A sample story is shown below, where a hedgehog and a frog are playing together in a park. In this story the hedgehog offers to give the frog a ride on his back, but the frog is concerned about touching the hedgehog's spiky fur on his back. The hedgehog reassures the frog by saying that his fur is soft because he is a baby hedgehog. After the frog rides the hedgehog, the frog wants to return the favour to the hedgehog by letting him ride on his back, but finds that it is impossible because his own back is too slippery and the hedgehog falls off him when he tries to ride him.



Figure 4: *The hedgehog was hard to ride* (Anderson 2005, 9)

At the end of the story the puppet tells what happened in the story, and the child determines if the puppet is right or wrong. The test sentence here *The hedgehog was hard to ride* is false with the

adult-like interpretation as in (32a) but would be true with the non-adult-like interpretation as in (32b) shown below.

(32) a. False = adult-like (AL) reading; *The hedgehog_i was hard for the frog to ride e_i.*

b. True = non-adult-like (NAL) reading; **The hedgehog_i was hard PRO_i to ride the frog.*

(Anderson 2005, 10)

Note here that the story is deliberately written in the way that either interpretation is possible. The following are the examples of children's responses to this task.

(33) "True" (3;5)

Experimenter: Why was the hedgehog hard to ride?

Child: Cause it's slippery.

Experimenter: Who's slippery?

Child: The frog.

(34) "False" (4;8)

Experimenter: Why was the hedgehog not hard to ride?

Child: Because the frog was slippy (= 'slippery') and the hedgehog wasn't.

This shows that subjects are not responding to the test sentence in a random or erratic manner.

Now, in order to confirm the prediction, I will look at the average age of acquiring both the DCC and *tough* constructions, with the production data search using a corpus database, i.e.

Child Language Data Exchange System (CHILDES; MacWhinney 2000). Hohaus et al.'s (2014) data suggest the average age of acquiring DCC to some extent. They have analyzed the following three corpora for acquisition of English comparatives.

Child	Collected by	Date downloaded	Ages	Number of child utterances
Adam	Brown (1973)	August 20, 2008	2;03-5;02	90,852
Sarah	Brown (1973)	August 20, 2008	2;03-5;01	31,369
Ross	MacWhinney (2000)	October 22, 2008	1;04-1;06, 2;06-7;05	30,912

Table 6: Corpora Analyzed for Mainstream American English

As I mentioned before, they consider the attributive or adverbial comparatives (repeated below) as evidence of childrens' knowledge of clausal comparatives.

(35) a. Pooh built a taller tower than Piglet. (Attributive Phrasal Comparative)

b. Clausal reading: *Pooh built a taller tower than Piglet built a d-tall tower*

'Pooh built a taller tower that is taller than the tower Piglet built'

c. Phrasal reading: *Pooh built a taller tower than Piglet*

'Pooh built a tower that is taller than the height of Piglet'

(36) a. Pooh jumps higher than Piglet. (Adverbial Phrasal Comparative)

b. Clausal reading: *Pooh jumps higher than Piglet jumps d high*

'Pooh jumps higher than the height Piglet jumps'

c. Phrasal reading: *Pooh jumps higher than Piglet*

'Pooh jumps higher than the height of Piglet'

The age of acquisition for these constructions was determined by the First of Repeated Uses (FRU), following Stromswold (1990) and Snyder (2007). FRU is the age at which a child produced his/her first clear example of a construction followed soon after (within the next two months) by regular use with a variety of lexical items. The following table summarizes their result.

FRU	Adam (2;03-5;02)	Sarah (2;03-5;01)	Ross (2;06-7;05)
Attributive Comparatives	Cannot be determined.	Cannot be determined.	4;04
Adverbial Comparatives	4;02	Cannot be determined.	5;06

Table 7: Age of Acquisition for Attributive/Adverbial Comparatives

Turning now to the production of *tough* sentences, Anderson (2005) reports that there are very few production data of *tough* sentences in the corpus database. In particular, she reports that only two possible instances are found in Wells's (1985) corpus.¹²² They are both "It's easy" by a girl of 2;6 and a boy of 5;0¹²³. The sentence is, however, not a clear instance of a *tough* construction, as its structure is ambiguous, i.e. it can be analyzed as smuggled by the Complex Op as in (37a), or as just the expletive subject as in (37b).

(37) It is easy to do.

¹²² The Wells (1985) corpus was compiled as part of The Bristol Language Development Project (1973-1977). The corpus contains files from thirty-two child speakers of British English who were recorded in a naturalistic setting. Each subject was taped at three-monthly intervals over a number of years. The earliest recordings are taken at approximately the age of 1;5 and the latest taken at 5;0.

¹²³ Since she found very few examples of the use of *tough* sentences even by the adult caretakers, she concluded that it is an infrequently used construction in English. Thus, we must note that due to the low frequency of the *tough* construction in spontaneous speech data, it is hard to conclusively determine the age of acquisition for this construction.

- a. It_i is easy [_{Op} t_i] to do t_i.
- b. It is easy PRO to do *pro*.

In order to determine the FRU of the *tough* construction in comparison to that of degree clausal comparatives, then, I searched for *tough* sentences (with the list of *tough* predicates including *easy*, *tough*, *hard*, and *difficult*) in Adam, Sarah and Ross corpora¹²⁴, and excluded the instances where the subject is *it*. I found 1 utterance of an unambiguous *tough* sentence in Adam corpus, 3 utterances in Sarah corpus, and 2 in Ross corpus. The following are the instances of *tough* constructions (CHI: child, MOT: mother, FAT: father):

(38) Adam

- CHI: Mommy (.) can you do dis [: this] ?
- CHI: dis [: this] too hard for me to do . (4;03.09)

(39) Sarah

- a. CHI: Mommy. can you do dis [: this] ?
- CHI: dis [: this] too hard for me to do. (4;01.18)
- b. MOT: isn't that nice (.) huh ?
- CHI: uhhuh.
- CHI: this [//] the puzzle's hard to do (.) huh ? (4;04.01)
- c. CHI: um (.) that goes right (.) here .
- CHI: oh the hardest corner is to get down (.) huh ?

¹²⁴ I have downloaded Brown's corpora on 10/27/2017 and MacWhinney's corpus on 3/14/2018 for the purpose of the analysis here.

CHI: the corner's hard to get down (.) right ? (4;04.01)

(40) Ross

a. CHI: is this part strong enough to climb up on. (3;8.18)

b. CHI: dad (.) I think we don't have so many toys (.) because they were
easy to put away . (4;10.27)

Due to the small size of the data collected, it is not possible to determine the FRU of *tough* constructions here. However, the first usages of the *tough* sentences are 4;3 for Adam, 4;1 for Sarah and 3;8 for Ross, which are close to the FRUs of the degree clausal comparatives reported in Hohous et al., i.e. 4;2 for Adam and 4;04 for Ross.

The common assumption for the delay in the acquisition of *tough* constructions in acquisitional literature is that children arrive at this interpretation by misparsing the structure of the *tough* sentence as a control structure, as shown below.

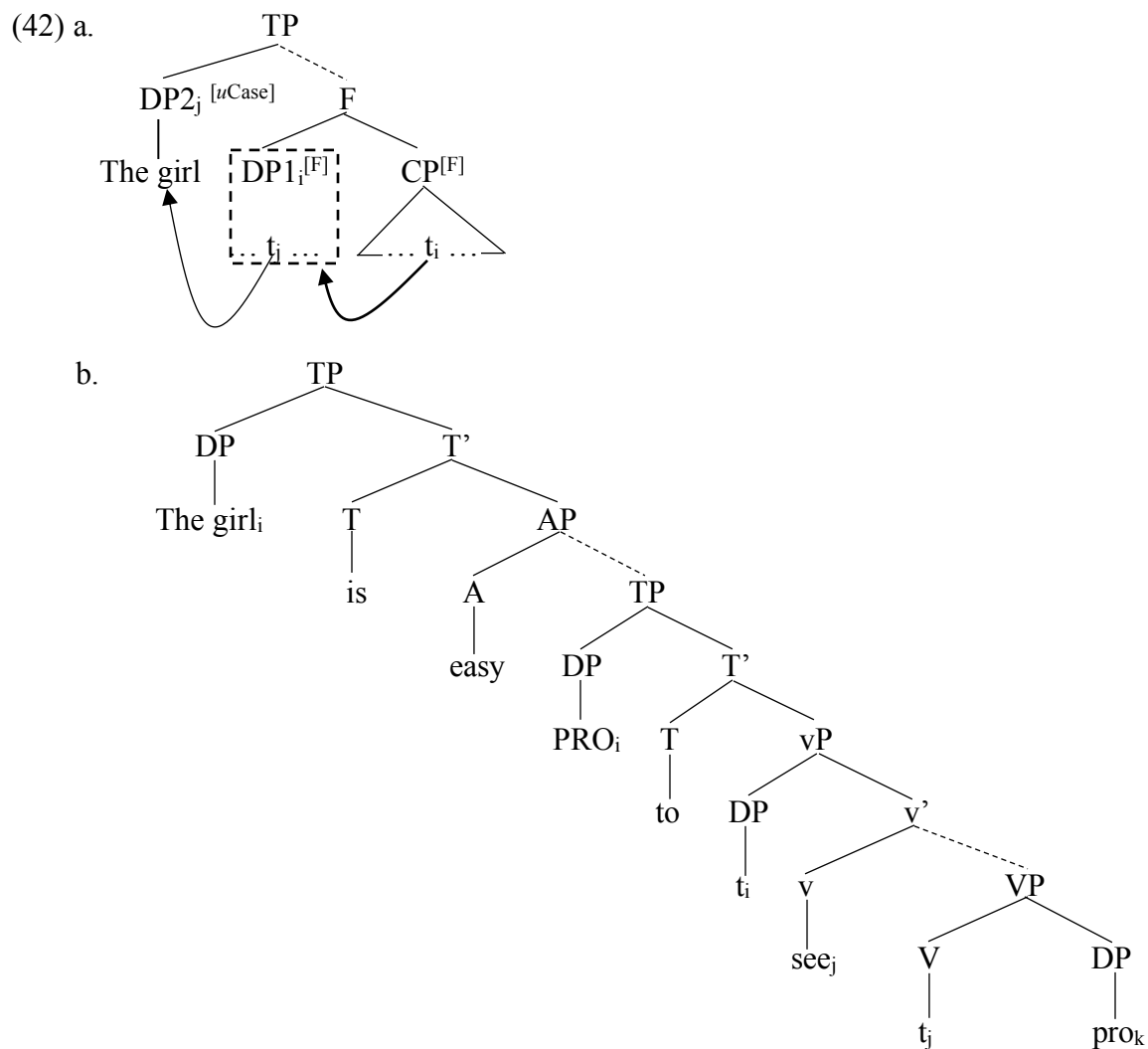
(41) a. [The girl_i is eager [PRO_i to see]]. (Control structure)

b. [The girl_i is easy [PRO_i to see pro_{arb}]].

(*tough* with incorrect subject reading: girl = subject of infinitive)

Based on what I discussed in the previous Chapters and the corpus search conducted for the three corpora (Adam, Sarah and Ross) above, I suggest that the reason for the misparsing is that children have not set the complex Op parameter until 4 years old (from 3;8 to 4;4 to be precise), so that they cannot analyze properly the sentence structure where the complex Op carries the subject up

(by smuggling), and thus cannot get the correct interpretation of *tough* construction. I.e. (42a) with complex Op is not available until they set the parameter at 4 years old, and thus they analyze the sentence structure as in (42b) instead (i.e. as a control structure), where no CNO is involved.



6.5.2. Passives

Another domain of grammar involving a construction that is learned late and that could be explained by the setting of the Complex Op Parameter concerns passive sentences. Many researches (e.g. Bever 1970; Horgan 1978; de Villers and de Villers 1978; Nguyen 2017; Gordon

and Chafertz 1990; Maratsos et al. 1998; Hirsch and Wexler 2006) have shown that English-learning children do not seem to acquire passive sentences¹²⁵ such as (43a) until about age of 4 or 5.

(43) a. The dog was hugged by Ernie.

b. Ernie hugged the dog.

Hirsch and Wexler (2006), for example, conducted a two-choice sentence picture matching task on sixty children with ten children included in every six-month interval from three years to six years, i.e. ten children each in 6 groups (3;0-3;5, 3;6-3;10, 4;1-4;5, 4;6-4;11, 5;1-5;5, and 5;7-5;11). In the task, the children were shown two pictures depicting opposite events side-by-side and asked to choose the picture that best matched the (active or passive) sentence they were read. The actional verbs used for the study were *push*, *kiss*, *kick* and *hold*. The following table shows the results, the percentage of correct response by children in each age group.

Group	Actional Actives	Actional Long Passives
3;0-3;5	93.8%	66.2%
3;6-3;10	93.8%	53.7%
4;1-4;5	95.0%	73.8%
4;6-4;11	90.0%	65.0%
5;1-5;5	96.3%	88.7%
5;7-5;11	96.3%	78.7%

Table 8

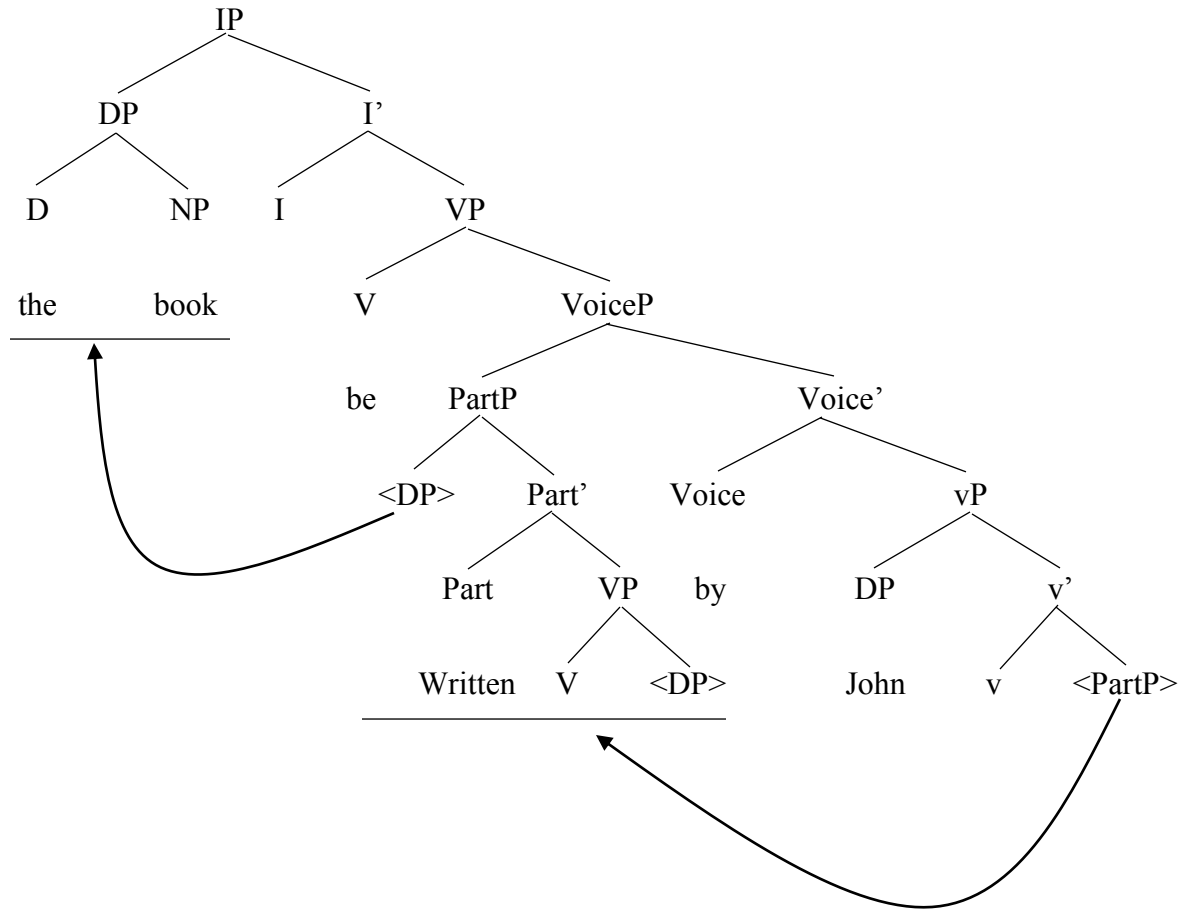
¹²⁵ The verb used here is categorized as an actional verb which is contrasted with non-actional verbs (e.g. *like*), with which the passives are harder for children to understand, i.e. they do not begin to do so until age 7 (Gordon and Chafertz, 1990; Maratsos et al., 1984; Hirsch and Wexler, 2006; a.o.). Also, the passives without the *by*-phrase are commonly referred to as *short-passives*, as opposed to *long-passives*.

Here, it is clearly shown that passives are answered less accurately than active counterparts, a significant main effect of voice ($p < 0.0001$).

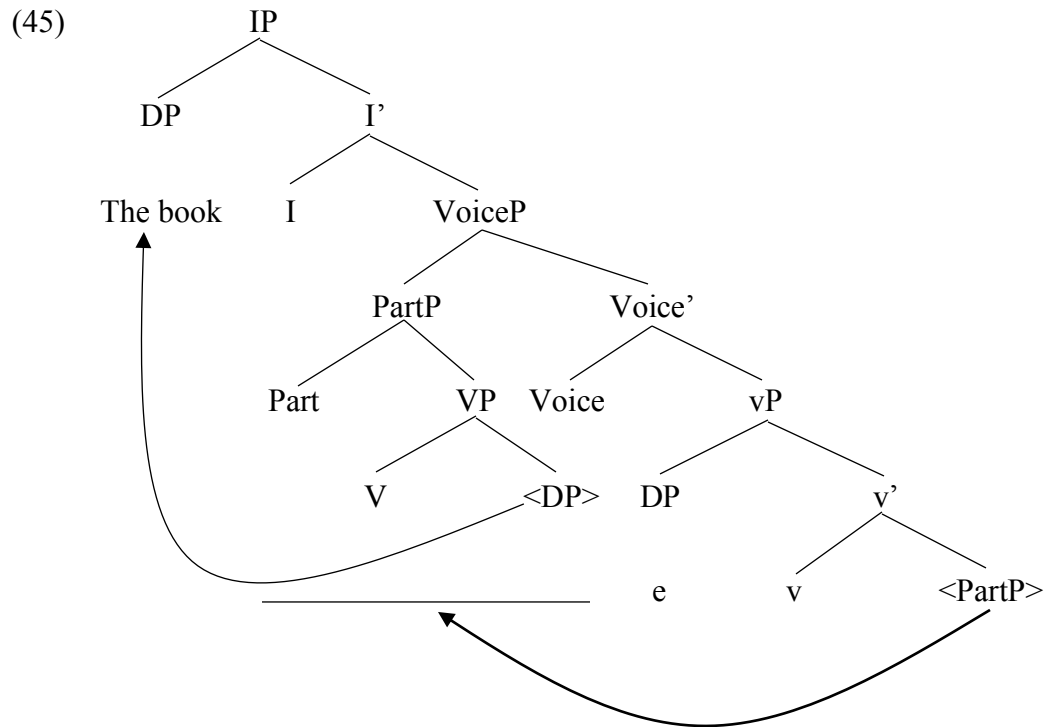
Many reserchers (Borer and Wexler 1987, Fox and Grodzinsky 1998, Fox et al. 1995) have tried to account for this delay in acquisition of passives. E.g. Bever (1970) attributes this to general difficulties with non-canonical word orders. Borer & Wexler (1987) or Wexler (2004) explain the delay by children's inability to compute the necessary grammatical operations. Fox & Grodzinsky (1998) blame the *by*-phrase itself for the delay. Based on the discussion in the previous Chapters and the same acquisition delay seen in degree clausal comparatives and *tough* constructions, I will make a speculation here regarding a new account based on the Complex Operator parameter [$\pm\text{COp}$].

Collins (2005a, b) takes the Smuggling approach to the passive in English. According to him, a passive sentence 'The book was written by John' for example is derived in the following way:

(44)



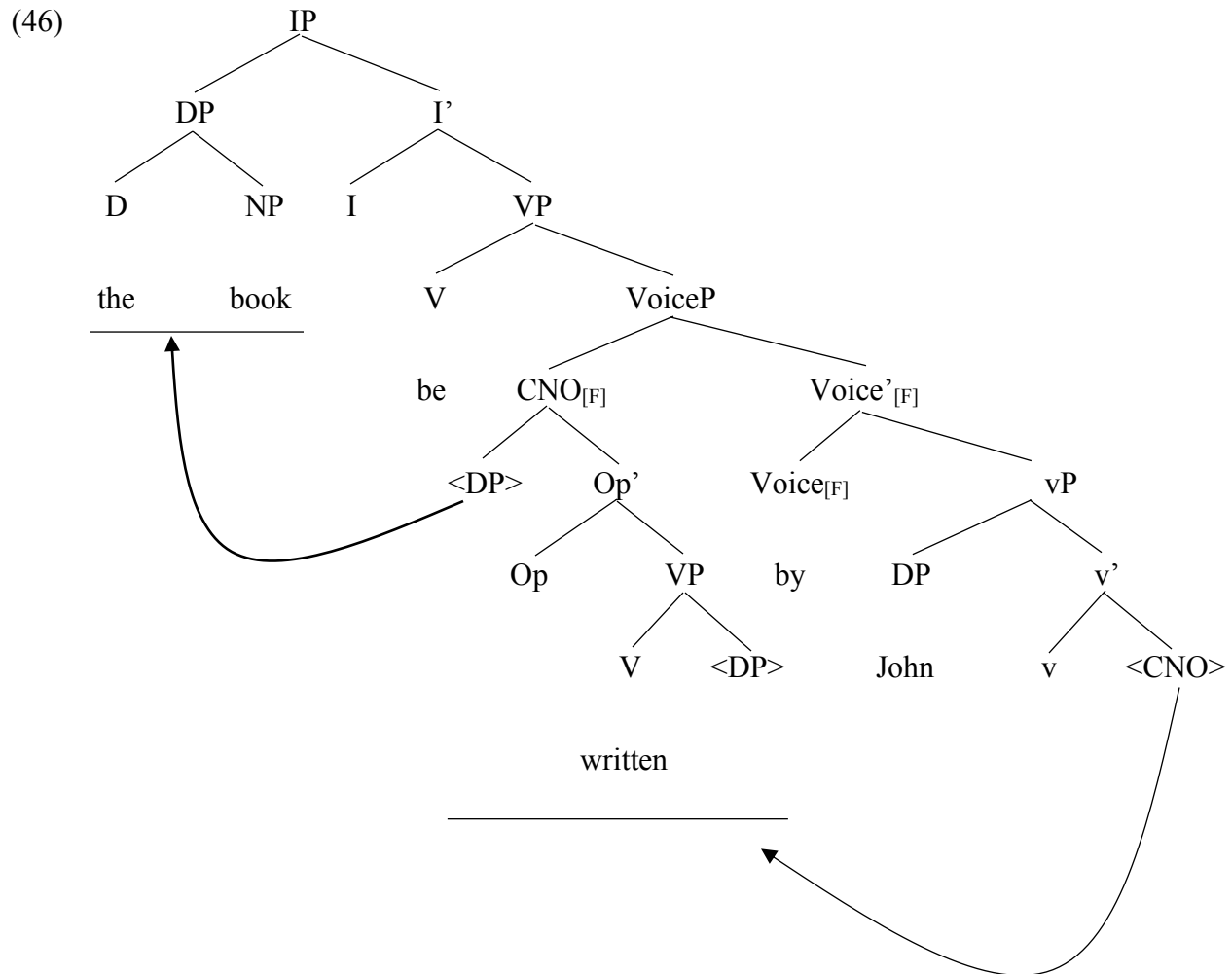
In the derivation, there is a PartP (participle phrase) headed by the morpheme *-en*, which takes a VP complement including the internal argument DP. This DP is “smuggled” into the IP spec position after the movement of the PartP to the spec of VoiceP. Collins proposes here that the external argument is merged into the structure in the passive sentence in the same way as in the active, i.e. the external argument is merged into Spec, vP in the passive just as the external argument in the active (see also Goodall 1997, Watanabe 1993, Mahajan 1994). This solves the problem with the θ -role assignment, i.e. the DP in the *by* phrase gets assigned an agent θ -role from the verb. Also, Collins assumes that short passives involve PartP movement to VoiceP spec and smuggling of the DP to the IP spec, where the DP in the vP spec is empty *e*.



It is not clear, however, what triggers PartP movement to the VoiceP spec. Presumably, it is because the internal DP *the book* needs to move to the IP spec in the end for its Case feature to be checked through ϕ -feature agreement. This means that the uninterpretable Case feature on the DP alone would need to move the entire PartP.

It seems natural then to assume that there is some kind of feature F on PartP itself which needs to be checked by its movement, just as is the case with the CNO movement in *tough* constructions. Therefore, I propose that Collins's smuggling approach is compatible with the following CNO approach where null operator is in fact involved, which I assume is connected to the presence of the F feature as in the case of the CNO in *tough* constructions in English¹²⁶.

¹²⁶ I tentatively assume here that NP-languages have a different system of deriving passives, which does not involve smuggling. At any rate, I put aside the behavior of NP languages here for future research.



Here, just like with the *tough* construction, CNO has a [uF] that drives its smuggling movement. I tentatively suggest that we may in fact have a more abstract relationship here. Consider a *tough* construction like (47).

(47) John is tough to please.

John has an uninterpretable feature, [uK], that will drive its movement to spec IP. The CNO smuggles the subject (i.e. *John*). I suggest that the smuggling uninterpretable feature on the CNO, which dominates *John*, is there because of the presence of the [uK] on the subject (*John*) that needs

to be checked off after the smuggling. I suggest that this is the nature of smuggling, where XP dominating YP has a [uF] because YP has a [uK]; this nature of smuggling is what is acquired late¹²⁷. The acquisition of all the constructions involving smuggling, then, may be delayed.

6.6. Conclusion

This chapter considered cross-linguistic variation in comparative constructions, especially the difference between quantity-compared clausal comparatives and degree-compared clausal comparatives from the perspective of language acquisition, and proposed a parameter involved in its acquisition process based on the Subset Principle (Wexler and Manzini 1987) and in light of the previous discussion of null operator constructions. Also, this view was compared with a different parametric view, where the relevant parameter is considered to be whether a certain semantic operation is incorporated in a language's grammar or not (see e.g. Beck, Oda and Sugisaki 2004, Beck et al. 2009). It was predicted that a learner of English (which has positive value for the relevant parameter involving the availability of a complex Op) should learn the QCC first and then switch to the more marked value [+COp], since s/he needs to figure out that complex Op is available in English before being able to comprehend/produce DCC. The complex Op is not necessary for QCC, where simple null Op, which is universally available, can be used in the derivation. Through an overview of the literature, it was pointed out that the test items used there were not appropriate to clearly show the children's understanding of clausal comparatives. The prediction was tested by a new experiment. The result was analyzed based on both the Subset Principle (Wexler and Manzini 1987) and the semantic parameter proposed by Beck et al. (2004). The main findings of the study were (i) there was a significant directionality between correct

¹²⁷ A similar conclusion is reached by Snyder and Hyams (2015), who propose that smuggling involved in the passive is maturationally unavailable until age four.

percentages of quantity clausal items and that of degree clausal items, i.e. Quantity-Clausal Comparatives \geq Degree-Clausal Comparatives, and (ii) there is not a strong correlation between the children's performance on overt measure phrase items and that on degree clausal comparatives, which would be expected by the degree abstraction parameter proposed by Beck et al. (2004). It was thus concluded that the result of this study supports the parameter based on the Subset Principle, and that it does not provide a support for the parametric view by Beck et al. I have also suggested that the acquisition of *tough* constructions in English is also delayed and coincides with the timing of the acquisition of DCC. Moreover, I have suggested an extension where smuggling constructions in the sense of Collins (2005a, b) may quite generally be delayed acquisitionally.

Appendix: Stories and Test Sentences Used in the Experiment

Practice

Homer - large bar of soap; Elmo - small bar of soap

Experimenter: Elmo and Homer are both about to take a bath.

Elmo: "I have to wash my hair. I have a lot of hair. I'll take this bar of soap for my bath."

Homer: "Well, I don't have very much hair, but I'm big, so I'd better take a big bar of soap for my bath."

Experimenter: "Cookie Monster, can you tell us something about the story?"

P1. Elmo has more hair than Homer has. (1)

P2. Elmo is bigger than Homer is. (0)

P3. Homer's soap is bigger than Elmo's. (1)

1 Quantity-Clausal 1

Frog - (3) bugs, (2) rocks; Smurf – (1) bugs, (4) rocks

Experimenter: "This is a story about *Frog* and *Smurf*."

Frog: "Oh, look at these great bugs I found. I love to collect bugs and keep them. I found one, two, three bugs. What did you find, Smurf?"

Smurf: "Bugs are okay. I found only one bug here but I love rocks. I found one, two, three, four excellent rocks."

Frog: "Oh I have some Rocks too. See, I found one, two rocks."

But I'd rather play with my bugs."

1a. The Frog found more bugs than Smurf found rocks. (0)

1b. The Frog found more rocks than Smurf found bugs. (1)

1c. (“Now cookie monster try really hard this time!”) **OK...let’s see... The number of bugs that Frog has, is bigger than the number of rocks that Smurf has.** (0)

2] Degree-Clausal 1

Green doll – tall (4 blocks high × 2 blocks wide);

Orange doll – square (3 blocks high × 3 blocks wide)

Experimenter: There are two friends here.

They are people from another planet and made of blocks.

The Green friend is one, two, three, four... so he is very ‘tall’ and the

Orange friend is one, two, three...so he is very ‘fat’.

Cookie Monster, can you tell us something about the friends?

2a. **Hmm, the Orange friend is fatter than the Green friend is tall.** (0)

2b. (“Now, Cookie monster, try really hard this time”) **OK...let’s see...**

The tallness of the Green friend is more than the fatness of the Orange friend. (1)

2c. **I know how tall the Green friend is! He’s 1 block tall!** (0)

3] Degree-Adverbial

Pooh - 5 bricks tall, Piglet - 2 bricks tall

Experimenter: This is a story about a king, Pooh and Piglet.

They are having a jumping contest.

King: “OK, Pooh and Piglet, you two get ready to try and jump over these bricks” “You go first, Pooh”

Pooh: “OK, here I go.” (Pooh jumps over 3 bricks)

“Now, I’ll try and jump over the higher one (Pooh crashes into 4 bricks).

Oh no, I crashed into it.” (Pooh stands next to the 3 bricks)

King: “OK, Piglet, now it’s your turn.”

Piglet: “OK, here I go (Piglet jumps over 3 bricks and 4 bricks, but crashed into 5 bricks). Oh no, I couldn’t jump over it.” (Piglet stands next to the 4 bricks)

Experimenter: “Now let’s look at the result”

King: “Nobody could jump over 5 bricks. But Piglet you jumped over 4 bricks, and Pooh only jumped over 3 bricks. So, Piglet did a great job, I will give you a star!” (Star flying to Piglet)

Piglet: “Yay”

3a. I know how tall Pooh is. He’s 3 bricks tall. (0)

3b. Pooh jumped higher than Piglet. (0)

3c. Piglet jumped higher than Pooh. (1)

4 Quantity-Clausal 2

Ariel - (4) coins, (2) jewels; Nemo - (3) coins, (3) jewels

Experimenter: Nemo and a mermaid named ‘Ariel’ decided to go to the king's birthday party.

Ariel: "I think I'll give the king some magic coins. I will take one, two, three and four coins. I'll also give him some jewels. Here, I'll take one, two of them!"

Nemo: "I think I'll give the king some special coins, too. One, two, three of them.

And I'll also give him some precious jewels. One, two, three of them!"

Nemo and Ariel: “Let’s go!”

4a. **Nemo has more coins than Ariel has jewels.** (1)

4b. **Nemo has more jewels than Ariel has coins.** (0)

4c. (“Now, Cookie monster you have to try really hard this time”)

ummm...The number of jewels that Ariel has, is bigger than the number of coins that Nemo has. (0)

5] Degree-Clausal 2

Girl – 5 bricks high × 3 bricks wide wall; Boy – 2 bricks tall × 4 bricks wide wall

Experimenter: “A girl and a boy made walls out of blocks. Their walls are different.

This one is very ‘tall’, but that one is very ‘wide’ ”

Girl: "Look at my wall! I made it all by myself. It is ... (count to 5) this tall. Isn't it great!"

Boy: "That's a really tall wall. My wall isn't that tall but it is really wide wall, see?

It's ... (count to 4) this wide!"

5a. **So, the boy's wall is wider than the girl's wall is tall?** (0)

5b. (“Now, Cookie monster you have to try really hard this time”) **OK...let's see...**

So, the tallness of the girl's wall is more than the wideness of the boy's wall? (1)

5c. **I know how tall the girl's wall is. It's 3 bricks tall.** (0)

5d. **I know how wide the boy's wall is. It's 4 bricks wide.** (1)

6] Degree-Attributive

Big Bird – 5 bricks tall, Ant – 2 bricks tall

Experimenter: This is a story about a King, Big bird and an Ant.

The King asked Big bird and the Ant to build a tall tower for him.

King: OK, first it's your turn, big bird.

Big Bird: OK, here I go. 1, 2, 3. (builds a 3 brick high building and stands next to it)

Ant: OK, now it's my turn! 1, 2, 3, 4. (builds a 4 brick high building and stands next to it)

King: Very nice. The Ant's tower is tall. I like it. Here is your prize! (a star is given)

Ant: "Yay!"

6a. Big Bird built a taller tower than the Ant. (0)

6b. The Ant built a taller tower than Big Bird. (1)

6c. I can see how tall the Ant is. He's 2 bricks tall. (1)

7 Quantity-Clausal 3

Dora - (3) straws, (3) balls; Boots - (4) balls, (2) straws

Experimenter: "Dora and Boots the monkey decided to go to a picnic."

Dora: "I think I'll take some toy balls with me to the picnic. I'll take one, two, three of them.

And I'll also take some drinking straws. Here I have one, two, three."

Boots: "I think I'll take some toy balls with me too. One two, three, and four balls.

And I'll also take along one, two drinking straws."

Dora and Boots: "Let's go"

7a. Dora has more toy balls than Boots has straws. (1)

7b. Dora has more straws than Boots has toy balls. (0)

7c. ("Now, Cookie Monster, try really hard this time") umm...The number of straws that Dora has, is bigger than the number of toy balls that Boots has. (0)

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