CLAUSAL VS. PHRASAL COMPARATIVES
Winfried Lechner, University of Athens
v1.0, February 2015
(to appear in The Blackwell Companion to Semantics,
edited by Lisa Matthewson, Cécile Meier, Hotze Rullmann, Thomas Ede Zimmermann)
Comments most welcome!

1. INTRODUCTION
The model theoretic representation of gradable adjectives such as tall or intelligent is standardly assumed to make reference to the notion of DEGREES, which can be conceived of as points ordered on a SCALE (Cresswell 1976; see chapter 14). For instance, to be 6 feet tall means to be tall to a degree which is equal or exceeds the degree that corresponds to 6 feet on the scale of vertical height. As the paraphrase above reveals, even simple degree predicates implicate RELATIONS between degrees. Some of these relations are grammaticalized in DEGREE CONSTRUCTIONS, the most prominent of which include equatives (as tall as), superlatives (tallest), excessives (too tall), their dual, sufficiency constructions (tall enough) and comparatives, exemplified by (1).

(1) a. John is taller than 6 feet. → The degree to which John is tall exceeds 6 feet.
   b. Ann is taller than Ben is. } The degree to which Ann is tall exceeds the
c. Ann is taller than Ben. } degree to which Ben is tall.

Semantically, comparatives express the greater than relation between a degree predicated of the subject to a second degree, commonly referred to as the STANDARD OF COMPARISON, which is provided by the structure following the STANDARD MARKER (than in English; terminology adopted from Ultan 1972). The overt form of the standard argument displays a wide range of variability. In (1)a, it is made EXPLICIT by a MEASURE PHRASE (6 feet). But the standard can also be introduced IMPLICITLY by a DEGREE CLAUSE, resulting in a CLAUSAL COMPARATIVE (CC; (1)b), or by a single, usually nominal constituent following than in PHRASAL COMPARATIVES (PC; (1)c). The present chapter is concerned with the distinguishing characteristics of CCs and PCs, the analyses these two structures have been given in the literature, and some theoretical implications arising from these accounts for the compositional semantics of degree constructions.

PCs have been posing intriguing challenges for theories of degree constructions mainly for three reasons. First, it needs to be decided whether PCs should be given the same analysis as unreduced CCs, hence affording a uniform semantics for comparatives, or whether there are designated semantic or syntactic mechanisms which are only at work in the derivation of PCs. Among others, the answer to this question has consequences for the organization of the lexicon. If all PCs can be shown to be truncated CCs, it is sufficient to posit a single entry for the comparative relation. By contrast, if it turns out that some PCs are not derivationally related to CCs, the functional vocabulary must be enriched to include lexical entries that are tailor-made to fit the semantics of PCs. An ancillary issue in this area is whether measure phrase PCs ((1)a) and regular individual PCs ((1)c) form a homogeneous class or not.
Second, while historically, the debate outlined above has been wielded between two camps holding adversary positions about PCs universally, largely ignoring language diversity, recent studies, extending the empirical scope from Germanic and Romance to Japanese, Greek, Slavic, Hindi, Chinese and other languages have resulted in a more nuanced cross-linguistic typology of PCs that also strives to account for language variation. Anticipating some results, a consensus has emerged that PCa are derived from CCs in some languages, but not in others, and that not all languages have access to both CCs and PCs in the first place.

Third, the study of PC has initiated a trend in the search for the sources of semantic diversity, investigating ‘deep’ semantic differences that cannot be reduced to lexical variation only. Specifically, it has been hypothesized that some languages do not admit binding of object language degree variables, and therefore resort to alternative strategies such as comparison of individuals, instead of degrees (Beck et al. 2004, 2009; Kennedy 2009). Findings in this domain are of relevance as they contribute to a better understanding of the nature of fundamental semantic parameters.

The chapter is structured in four sections. Subsequent to the explication of some background assumptions on degree semantics and the syntax of gradability and comparatives in section 2, section 3 will trace the main positions in the history of the study of PCs within the generative framework. Section 3.1 introduces some basic contrasts between PCs and CCs, while 3.2 explores more recent discoveries, focusing on analytical strategies that have been developed in order to accommodate these findings. The discussion will also include a wider array of cross-linguistic data. Section 4 reports current trends. Even though syntactic criteria will be seen to play an important role throughout the article, remarks on form will be limited to the necessary minimum and mostly to areas that have a direct effect on meaning.

2. Background: The Syntax and Semantics of Comparatives
The semantics of comparatives involves three central components: (i) a gradable property such as tall, intelligent or many; (ii) degree semantics, which is commonly taken to be encoded in DEGREE HEADS and morphologically reflected in the presence of comparative morphology (-er or more in English). Degree heads in turn relate the gradable property to (iii) the standard of comparison, which can be supplied by a measure phrase ((1)a), a full degree clause ((1)b) or a single, typically nominal standard argument in PCs ((1)c). The present section lays out basic assumptions about each of these three ingredients in turn.¹

2.1. Semantics of gradable adjectives
There are three prominent views on the semantics of gradable adjectives. On the vague predicate (also delineation) theory, gradable and non-gradable predicates (even, linguistic, French) are assigned the same semantic type (<e,t>), but differ in the way they choose their denotation domain (McConnell-Ginet 1973; Kamp 1975; Klein 1980, 1982; van Benthem 1983; Larson 1988; Sánchez-Valencia 1994). An adjective like tall denotes a partial function that partitions the individual domain into three sets: a positive extension which collects all tall entities, a

¹For surveys of degree semantics see Klein (1991); Schwarzschild (2008); Beck (2011); Pancheva (2012) and Morcycki (2014).
negative extension of individuals that are not tall, and an extension gap for those individuals which are neither tall nor short (Klein 1980). The existence of the third, neutral partition (Sapir 1944) is justified, among others, by the observation that the negation of a gradable adjective *(John is not tall)* does not entail its antonym *(John is short)*.

In contrast to the ontologically nominalist, vague predicate theory, the second perspective, which has become predominant in the field and will also be adopted here, embraces the realist position that the atomic denotation domain is enriched by degrees of type \(d\). Concretely, degrees are abstract representations of measurement that are elements of a partial (i.e. reflexive, transitive and antisymmetric) order. Together with a lexically specified dimension \(\text{DIMENSION}\), which determines the property to be measured (e.g. height, length, weight, age or temperature), such an order constitutes a scale. Gradable adjective meanings are then defined as symbols of type \(<d,<e,t>>\) (or \(<e,<d,t>>\) which express relations between individuals and sets of degrees on a scale, relative to a dimension (Seuren 1973; Hellan 1981; von Stechow 1984; Heim 1985; Bierwisch 1989).

These degree functions are usually assumed to be monotone decreasing (Gawron 1995: 348; Heim 2000).\(^2\) As a result, a predicate like *tall*, which is lexically associated with a scale of linear extent, has in its extension for each individual the set of degrees from the lowest scale point up to that individual’s height ((2)). A sentence like (3)a accordingly states that John is at least six feet tall and assigns to John the set of degrees from zero up to John’s actual height, as shown in (3)b. (Bold face marks expressions of the object language inside denotation brackets).

\[
(2) \quad \text{[tall]} = \lambda d, \lambda x. \text{HEIGHT}(x) \geq d
\]

\[
(3) \quad \begin{align*}
\text{a. } \text{[John is [[6 feet] tall]]} \\
\text{b. } [[(3)a]] = \text{HEIGHT}(\text{John}) \geq 6 \text{ feet}
\end{align*}
\]

Note that the degree relation is defined in terms of ‘greater than’ and not equality. This choice is motivated by the fact that John qualifies as 6 feet tall even if he exceeds the explicit standard. Furthermore, using equality in the definition of the adjective meaning would have the undesirable consequence of having *John is tall and Mary is tall* entail that John and Mary are of the same height (Gawron 1995).

The lexical entry (2) does not make yet explicit, though, how real world objects are related to their metalanguage degree values. This task is delegated to the *Representational Theory of Measurement* (RTM; Krantz et al. 1973). In RTM, a scale is conceived of as an abstraction from objects and their relations in the real world, formally defined as a homomorphism from a qualitative, empirically established order of objects into a numerical structure (usually the set of real numbers \(\mathbb{R}\)). For instance, the empirical relations among line segments on the left of (4) can be mapped into various homomorphic numerical orders, two of which are spelled out in (4) as \(\mu_1\) and \(\mu_2\). These order preserving relations \(\mu_1\) and \(\mu_2\) from individuals to numbers are also known as measure functions \((\mu)\). A measure function assigns each object to its position on a scale,

\[^2\text{A function } f \text{ is [downward] monotone iff } \forall x \forall d \forall d' \left[f(d)(x) = 1 \land d' < d \rightarrow f(d')(x) = 1\right]\]

[Heim 2001: 216]
relative to a given dimension (height, weight, age, etc...).³

(4) Empirical order

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>b</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>c</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

\[ a \succ b, c \succ b, c \succ a \]

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a &gt; b, c &gt; b, c &gt; a</td>
<td>a &gt; b, c &gt; b, c &gt; a</td>
<td>a &gt; b, c &gt; b, c &gt; a</td>
</tr>
</tbody>
</table>

Applied to gradable adjective semantics, the meaning rule (2) can now be decomposed into the measure function \( \text{HEIGHT} \) of type \( <e,d> \), which maps each individuals to its unique degree of its height, and a functor \((\lambda\mu_{e,d}\lambda x\mu(x) \geq d)\) turning \( \text{HEIGHT} \) into a relation between individuals and sets of degrees. Alternatively, it has been suggested to use bare measure functions as the denotation of gradable adjectives (Bartsch and Vennemann 1973; Kennedy 1999).

The third theory of gradability minimally differs from the degree analysis presented above in that degrees are not primitives of the model but emerge from equivalence classes of individuals (Cresswell 1976). According to this conception, the extension of an adjective like \textit{tall} is partitioned into mutually exclusive cells, each of which contains all individuals of equal height. Since numerical degrees can be conceived of as names for these equivalence classes, this view is for all means and purposes identical to the degree analysis.⁴ As already noted, the present article presupposes that the denotation domain also includes degrees (see also section 4.2).

2.2. Degree heads

In degree constructions, lexical entries of gradable properties such as (2) combine with a member of a family of abstract \textit{degree head} encoding the positive, equative, superlative or comparative meaning. It is commonly assumed that these operators are embedded in a functional \textit{DegP} projection, which also contains the gradable property and the degree complement (Abney 1987; Corver 1990). Although there are in principle at least the three possible factorizations for these three components made explicit in (5), all of which have been explored in the literature,⁵ the best account for a transparent mapping from syntax to semantics resides with scheme (5)c, where the \textit{AP} serves as the subject and the standard argument is the complement of the comparative degree head \textit{MORE}:

(5) a. \[ [\text{AP} [\text{DegP} \text{MORE than-phrase}] A^a] \quad \text{(DegP in SpecAP)} \]
   b. \[ [\text{DegP} [\text{MORE AP than-phrase}]] \quad \text{(AP and standard as complements of MORE)} \]
   c. \[ [\text{DegP} \text{AP} [\text{MORE than-phrase}]] \quad \text{(AP as subject, standard as complement of MORE)} \]

First, (5)c gives substance to a venerable tradition in semantics, also reflected in current analyses ³μ₁ and μ₂ both maintain the original qualitative order, but only μ₁ also preserves the proportions. Thus, the set of admissible μ’s has to be further restricted. For these and related issues of RTM see Lassiter (2011) and references therein. On the relevance of RTM in linguistics see Sassoon (2010).

⁴To be precise, equivalence classes are more expressive than RTM; see Lassiter (2011).

⁵For an overview, see Pancheva (2012), Morczeck (2014) and Lechner and Corver (to appear), a.o.
(Cresswell 1976; Heim 1985, 2000; see below), according to which the comparative head and
the degree complement form a semantic constituent. Second, the head-complement dependency
between Deg° and the degree clause is particularly well-suited to express the fact that different
degree heads select for different types of degree complements (as tall as, taller than, too tall to;
Bresnan 1973). Finally, parsing the AP and the degree head into a specifier-head configuration
makes it possible to link the emergence of comparative morphology (-er) on the head of the AP
to feature valuation between two features ([COMP]) on MORE and AP. The more fine-grained
syntax of (1)a, including morphosyntactic features, can accordingly be spelled out as in (6).⁶

(6) \[ \text{TP John is } [\text{DegP [AP taller[COMP] [Deg° MORE[COMP] [standard than 6 feet]]]}] \]

The semantics of MORE has been given a variety of definitions in the literature, which
differs, among others, in the domain of the comparison relation (degrees vs. intervals, i.e.
connected sets of degrees) and the force of the operators used to quantify over these
degrees/intervals in the metalanguage (MAX vs. ∃ vs. ∀). According to the maximization theory
(Russell 1905; von Stechow 1984; Rullmann 1995), the lexical entry for MORE is a symbol of

![MORE](λd.λg.λx.\text{MAX}(λd'.g(d')(x)) > d)

(8) \text{MAX} \equiv \text{Def} λD.τd[D(d) ∧ ∀d'[D(d') → d' ≤ d]]

Assuming that measure phrases denote degree descriptions of type d (but see below) and that
the complementizer than is semantically vacuous (von Stechow 1984; but see below), the sample
derivation of (6) proceeds as in (9). The degree head (7) combines with the standard (6 feet) first,
and takes the gradable adjective denotation as its second argument. As desired, sentence (6)
describes situations in which John’s maximal degree of height exceeds 6 feet.

(9) \[ [\text{MORE} ([\text{than 6 feet}]) ([\text{tall}]) ([\text{John}])] = \]
\[ = λdλg.λx.\text{MAX}(λd'.g(d')(x)) > d \text{ (6 feet) } (λdλx.\text{HEIGHT}(x) ≥ d) \text{ (John)} \]
\[ = λx.\text{MAX}(λd'.dλx.\text{HEIGHT}(x) ≥ d (d')(x)) > 6 \text{ feet (John)} = \]
\[ = λx.\text{MAX}(λd'.\text{HEIGHT}(x) ≥ d') > 6 \text{ feet (John)} = \]
\[ = \text{MAX}(λd'.\text{HEIGHT}(John) ≥ d') > 6 \text{ feet} = \]
\[ = τd[H(John) ≥ d ∧ ∀d' [H(John) ≥ d' → d' ≤ d]] > 6 \text{ feet} \]

To avoid clutter, metalanguage will be simplified, using the notational shorthand \(λdλx.x \text{ is } d\text{-tall}\)
for the translation of a natural language predicate like \text{tall}.

⁶Periphrastic comparatives (more intelligent) require a more complex syntax, possibly involving an
additional functional projection above DegP that hosts more (Corver 1997; Embick 2007; Bobaljik 2012).
Finally, differential comparatives (*John is 2 inches taller than Bill*) can be integrated into the analysis by adding a differential degree argument to the revised version of *MORE* in (10). Differentials are set to zero or existentially bound if left unpronounced.\(^7\)

\[(10) \quad \text{[MORE]} = \lambda_d \lambda d' \lambda g_{d,d',<e,t>} \lambda x_e. \text{MAX}(\lambda d'. A(d')(x)) > d + d'\]

As was seen above, the maximization analysis ((7) and (10)) is directly compositional (in the sense of Barker and Jacobson 2007) in that it computes all three components of the comparative – the degree head, the AP and the standard value – *in-situ*. This misses an important generalization, though, brought to attention by Heim (2000) and Stateva (2000). Both the comparative relation expressed by *MORE* and the degree clause also admit non-surface interpretations. To illustrate, the differential comparative (11) is ambiguous between a wide and narrow scope reading of *MORE* with respect to the modal *required* (Heim 2000; for precedents see Gawron 1995). Relevant portions of the LFs are spelled out in (12). (*Acc\(_{\text{Deon}}(w)* denotes the set of deontic alternatives accessible from \(w\).)

\[(11) \quad \text{The paper is required to be exactly 5 pages longer than 10 pages.}
\]

a. \(\lambda w. \forall w' \in \text{Acc}\(_{\text{Deon}}(w)(w') \rightarrow \text{MAX}(\lambda d. \text{the paper is } d\text{-long in } w') = 15 \text{ pages}
\)

‘The paper must be no longer than 15 pages.’ \(\text{(narrow scope, maximum)}\)

b. \(\lambda w. \text{MAX}(\lambda d. \forall w' \in \text{Acc}\(_{\text{Deon}}(w)(w') \rightarrow \text{the paper is } d\text{-long in } w') = 15 \text{ pages}
\)

‘The paper must be at least 15 pages long.’ \(\text{(wide scope, minimum)}\)

\[(12) \quad \text{a. [required } [[\text{exactly 5 pages MORE than 10 pages} ] [\text{the paper be } d\text{-long}]]\]

b. [[exactly 5 pages MORE than 10 pages] [required [the paper be d-long]]]

The surface scope interpretation (11)a/(12)a states that in all worlds compatible with the regulations, the length of the paper is exactly 15 pages and no longer. This amounts to an upper limit on the paper’s size. By contrast, the inverse scope reading (11)b equates the length of the shortest paper (viz. the maximal degree all papers reach across worlds) with 15 pages, imposing a minimal length requirement.

Notably, the derivation of the LF-representation (12)b implies that the unit *exactly 5 pages MORE than 10 pages* can scope out of its base position. Whereas this is unexpected on the maximization analysis, which computes all components *in-situ*, the passage from surface syntax to (12)b finds a natural explanation if the degree head *MORE* is treated as a second order predicate of degrees, that is a quantificational determiner in the degree domain (Beghelli 1994; Gawron...)

\(^7\)Lexical entries for the other degree heads can be defined in analogy to *MORE*. *LESS* is like *MORE* with > replaced by <, equatives are based on ≥ or = (Rett 2008). The positive head *POS* includes a contextually given standard value, e.g. supplied by a standard function, which serves the same purpose as the explicit standard in comparatives. Among others, this accounts for the fact that the comparative (6) does not entail the positive *John is tall*.\(^i\)

\[(i) \quad \text{[POS]} = \lambda d \lambda g_{d,\leq,e,t} \lambda x_e. \text{MAX}(\lambda d'. A(d')(x)) > \text{standard}(g)\]

Note on the side that semantically, the meaning of the positive is not a proper subpart of the comparative, even though it appears to be a cross-linguistic universal that comparatives are morphologically derived from the positive form (Bobaljik 2012).
The quantificational version of MORE (13) takes two sets of degree as arguments. The meaning of MPs (10 pages) accordingly needs to be adjusted so as to map them into sets of degrees instead of entities of the atomic degree domain. In fact, that MPs are ambiguous between a degree and degree predicate reading has been independently argued by Schwarzschild (2005, crediting McConnell-Ginet 1973). With this change in place, the combination of MORE and the standard argument (10 pages) results in a Generalized Quantifier of degrees (<d,<d,t>). Similar to individual quantifiers in object position, the unit [MORE than 10 pages] undergoes QR in order to avoid a type conflict with its sister adjective denotation (<d,<e,t>); see (14)a, binding from its landing site a degree variable in the location of the trace.9 (14)b is the desired model theoretic translation mediated by the LF (14)a. (Following Heim and Kratzer 1998, the movement index is subscripted to the λ-binder; differential argument suppressed):

On this ‘standard theory’ of comparatives, the ambiguity in (11) is explained by the different landing sites for the degree quantifier, hence an ambiguity in syntactic scope. The hypothesis that degree quantifiers undergo QR receives further support from degree clause internal ellipsis phenomena. But since the discussion of the relevant evidence presupposes the articulated structure for clausal degree complements to be introduced in section 3, discussion will be postponed for the moment.10 Before proceeding, it is instructive to turn briefly to an alternative

---

8(i) lists three popular alternative meanings for MORE, all of which deliver identical truth conditions for the simple cases (see Pancheva 2012):

(i) a. $\text{MORE} = \lambda D_{d,f} \lambda D'_{d,f}. \text{MAX}(D) < \text{MAX}(D')$ [Bhatt and Pancheva 2004]
   
   b. $\text{MORE} = \lambda D_{d,f} \lambda D'_{d,f}. \exists d[D(d) < \text{MAX}(D')]$ [von Stechow 1984]
   
   c. $\text{MORE} = \lambda D_{d,f} \lambda D'_{d,f}. \exists d[D(d) < \text{MAX}(D')]$ [Seuren 1973; Larson 1988; McConnell-Ginet 1973; Ross 1968; Klein 1980; Doetjes et al. 2011, a.o.]

The choice among these versions is not straightforward. For instance, the subset entry is better equipped than the maximization definition to handle degree clauses without a maximum, such as *Ann is shorter than Ben, which arguably derives from than Ben is not d-tall (Beck 2011: 1353). Beck also notes that as an undesirable side effect, though, this would invalidate von Stechow’s (1984) maximization analysis of negative islands (*Ann is taller than Ben is not).


10The movement analysis also potentially profits from the parallelism between the Name Constraint ((i)) and Definiteness Effects in comparatives (Lerner and Pinkal 1995; Xiang 2005). In both cases, strong determiners appear to block movement of the bracketed constituents:

(i) [Who] did you paint a/*the/*every picture of t.
   
   (ii) Peter owns a/*the/*every fast[er car than Bill]. [Lerner and Pinkal 1995]
explanation for the scope facts, though, which will resurface prominently in the discussion of PCs below (see 3.2.5).

Departing from the orthodox conception, Alrenga et al (2012) propose that the comparison relation is encoded in the standard marker than instead of the degree head, as made explicit by the lexical entry for than in (15) (sup denotes the supremum function, which singles out the least upper bound of a set; Alrenga and Kennedy 2014).

\[ \text{[THAN]} = \lambda D_{<d,t>} \lambda D'_{<d,t>} \sup(D) < \sup(D') \]  
\[ \text{[Alrenga et al. 2012: (6)b]} \]

(16) a. The paper is required to be exactly 5 pages longer than 10 pages. (= (11))
    b. \[ [<<d,t>,t> \lambda \text{required [the paper is (exactly 5 pages) } d_1\text{-long]]} \]
    \[ [<<d,t>,<<d,t>,t>> \text{THAN} <<d,t>,<<d,t>,t>> [<<d,t> 10 \text{pages}]] \]

Ignoring irrelevant details as well as the differential argument, the analysis assigns to (11), repeated above as (16)a, the LF-representation (16)b. In contrast to the QR-analysis of comparatives, the degree complement is base-generated in its surface position, from where it binds the degree argument (\(d_1\)) of the matrix AP. Since the than-phrase can be merged above or below the modal, both readings of (16)a are accounted for. One of the advantages of this alternative conception is that it does not need to stipulate an abstract constituent made up of the degree head and the standard argument, two expressions that do not form a morphosyntactic unit. Another potential benefit of the analysis, to be addressed in section 3.2, is that it is, at least at first sight, better equipped to capture cross-linguistic morphosyntactic variation.

2.3. The internal structure of degree clauses
In the examples so far, the standard marker was supplied by degree predicates that surfaced as measure phrases. Expanding the empirical scope to clausal comparatives, the current subsection reviews aspects of clausal degree complements, exemplified in (17), which will equally be seen to denote expression of type <d,t>.(Angled brackets enclose unpronounced nodes.)

(17) a. Ann is taller than OP, Ben is <d_1-tall>.
    b. Mary wrote better poems than OP, John wrote <d_1-good poems>.
    c. Sally worked more intensely than OP, Bill worked <d_1-intensely>.

From there, the discussion will turn to signature differences between PCs and CCs in section 3.

The internal makeup of the matrix clause diverges from the structure of the degree clause in two significant ways. First, in order to guarantee a transparent mapping procedure from syntactic form to semantic interpretation, it is usually assumed that the degree complement contains a copy of the gradable property overly represented in the main clause (\(d\text{-tall} \) in (17)a) which is silenced by COMPARATIVE DELETION (CD; Bresnan 1973; see also Lees 1961). As shown by (17), CD may target expressions of different categorial specification, including APs.
In analogy to the matrix clause, the gradable property occupies the specifier of DegP, while the complement position of DegP introduces a degree variable (d in (17)) that serves as the external argument of AP and is bound by an empty operator (OP) in the left periphery of the clause.

Variable binding relates to the second distinguishing property of degree clauses: they are empty operator movement constructions, displaying syntactic and semantic characteristics similar to relative clauses and tough constructions, among others (Chomsky 1977). Syntactic reflexes of this covert displacement process can be detected in island configurations (*Ann is taller than OP Ben invited a friend who claimed that Mary is t_1*). Semantically, OP-movement leads to the formation of a derived predicate of degrees by abstraction over the degree variable inside DegP:

\[
(18) \quad \text{Ann is } [\text{DegP } \text{taller} [\text{MORE (than)} [\text{<d,t>} (\text{OP}) \lambda _{1} \text{Ben is } [\text{DegP } \text{<tall}<\text{d},<\text{e},\text{t}>] ]]]
\]

As seen in (18), degree abstraction supplies the matrix degree head MORE ((13)) with a suitable <d,t>-type denotation to combine with. One notable consequence of this system is that the degree head inside the degree clause is semantically empty (but see Alrenga et al. 2012).

In attributive constructions, illustrated in (19), the AP and the common noun form a unit which occupies SpecDegP. This has three desirable effects (Lechner 2004). First, degree abstraction by OP-movement does not induce a left-branch violation, because the degree variable d_1 is, unlike in the orthodox phrase structure assigned to (19)a, not trapped inside an AP-adjunct:

\[
(19) \quad \begin{align*}
\text{a. Mary met an older man yesterday than Sally met.} \\
\text{b. Mary met } [\text{DP } \text{an } [\text{DegP } [\text{old man}]_{\text{COMP}} ] ] & \quad \lambda _{1} \text{Sally met } [\text{DP } \text{a } [\text{DegP } \text{<old man}> [\text{Deg' MORE}_{\text{COMP}} ] ] ]\\
\end{align*}
\]

Second, on the parse (19)b, the than-phrase serves as the complement of the matrix degree head. As a result, it is free to escape prenominal APs ((20)a), which are known to block extraposition in non-comparative contexts ((20)b; example adapted from Alrenga et al. 2012):

\[
(20) \quad \begin{align*}
\text{a. Mary met } [\text{an } [\text{older t_1 }] \text{ man} ] \text{ yesterday } [\text{than Sally met}]_{1}. \\
\text{b. *Mary met } [\text{an } [\text{angry t_1}] \text{ man} ] \text{ yesterday } [\text{at Sally}].
\end{align*}
\]

Finally, in attributive phrasal comparatives, the size of CD correlates with the position of the degree complement (Bresnan 1973):

\[
11\text{While the second occurrence of } \text{tall cannot be phonologically realized in (17)a, a limited set of languages also admits SUBDELETION constructions, which involve two overt, distinct degree predicates (Beck et al. 2009; Kennedy 1999, 2002; Stassen 1985):}
\]
\[
(\text{i}) \quad \text{Rod A is longer than the door is wide.}
\]

\[
12\text{The reasoning also extends to approaches that introduce the degree clause in its scope position (Bhatt and Pancheva 2007; Alrenga et al. 2012), as they also need to be able to structurally distinguish between licit ((20)a) and illicit instances of dislocation to the right ((20)b).}
\]
In the postnominal construction (21)a, CD has removed the gradable AP only, whereas in the prenominal comparative (21)b, the sortal conflict triggered by predicating *young man* of *Sally* signals that the elided constituent comprises both the AP and the head noun. A natural interpretation of this asymmetry resides with the assumption that SpecDegP is occupied by an AP in (21)a, but the unit [AP NP] in (21)b.

The remainder of this section turns to independent evidence for the QR theory of comparatives from correlations between ellipsis and coreference. Similar patterns will surface prominently again in the discussion of PCs, where they will aid in adjudicating between competing analyses of the construction.

2.4. The Ellipsis-Scope Generalization

The paradigm (23) documents that comparatives behave like nominal quantifiers ((23)b) and unlike bare plurals ((23)c) in that they can embed an antecedent contained deletion (ACD; Larson 1988; Wold 1995; Lerner and Pinkal 1995). Assuming that at LF, the node containing the ellipsis must be located in a position above its antecedent in order to be properly licensed, this indicates that the bracketed constituents in (23)a and (23)b have been moved by QR, or alternatively, have been directly inserted in their scope positions (Bhatt and Pancheva 2004; Alrenga et al. 2012):

(22)

a. John was climbing higher trees/more trees [than Bill was]. [Heim 2001]
b. John was climbing every tree [that Bill was].
c. *John was climbing trees [that Bill was].

The claim that degree phrases are mobile is further solidified by correlations between ellipsis scope and disjoint reference effects, captured by the ELLIPSIS-SCOPE GENERALIZATION (Williams 1974; Gawron 1995; Bhatt and Pancheva 2004; a.o.). (23) admits both a narrow ellipsis (*than Mary’s boss works*) and a wide ellipsis reading (*than Mary’s boss tells her to work*). This ambiguity is commonly held to be the result of the varying height of attachment for the degree clause, which can, as posited by the QR-analysis, either adjoin to the lower or the higher TP:

(23)

Her father tells her₁ PRO₁ to work harder than Mary₁’s boss does.

a. \[[_{TP₁} [\text{MORE} than \lambda₂ \text{Mary}_1’s boss works d₁-hard]]_{\text{<d₃,p>₄}}, (\text{MORE} > \text{tell})\]\n
\[\text{[d₃₋₄, λ₃ her father tells her₁ to work d₁-hard]]}\]

‘Her father tells her₁ to work harder than Mary₁’s boss tells her to work.’

b. \*\[\left[_{TP₁} \text{her father tells her₁ } \left[_{TP₂} \text{MORE} than \lambda₂ \text{Mary}_1’s boss works d₂-hard]_{\text{<d₄,p>₅}}, \right. \right.\]

\[\text{[d₄₋₅, λ₃ to work d₁-hard]]}\]

‘Her father tells her₁ to work harder than Mary₁’s boss works.’

Furthermore, (23) sanctions coreference between *Mary* and *her* on the wide ellipsis construal (23)a only. This follows if wide ellipsis correlates with attachment of the degree clause to TP₁ above the pronoun ((23)a, while in the narrow ellipsis reading, the degree quantifier moves
locally to the lower TP2 ((23)b).

To account for the Ellipsis-Scope Generalization, it moreover has to be ensured that the trace of the degree quantifier (d3 in (23)a) does not contain a syntactic copy of the scoped constituent ([.... than λ2 Mary’s boss works...]). Otherwise, both LFs in (23) would be expected to be barred by Principle C. Two strategies have been suggested in the literature. Either the degree clause is introduced in the derivation counter-cyclically, subsequent to movement of the degree head MORE to its scope position, as illustrated in the partial derivation (24) (Bhatt and Pancheva 2004). Late Merge of the underlined constituent in (24)b has the effect of inserting the name (Mary) at a point where it is no longer c-commanded by the pronoun (her):

(24) a. *Move MORE to scope position*
   [MORE [λ3 [TP1 her father tells herj PROj to work d1-hard]]]

   b. *Late Merge of degree clause*
   [[<<d,t>,t> MORE [<<d,t>,t> than λ2 Mary’s boss works d2-hard]]
   [<<d,t>,t> λ3 [TP1 her father tells herj PROj to work d3-hard]]

Alternatively, if the comparative relation is assumed to be expressed in the standard marker than, the whole degree complement can, as pointed out by Alrenga et al. (2012), be base generated in its scope position, without evoking the arguably byzantine mechanism of counter-cyclic late insertion below the root node:

(25) Degree clause base generated in scope position
[[<<d,t>,t> THAN λ2 Mary’s boss works d2-hard]
[<<d,t>,t> λ3 [TP1 her father tells herj PROj to work d3-hard]]

Thus, both variants of the quantificational analysis find empirical support from correlations between the scope of the comparative relation, measured in terms of ellipsis size and admissible coreference patterns.

The present section reported findings from the literature indicating that comparative semantics is the result of a second order relation of degrees, encoded either in the two-place degree head MORE or the standard maker THAN. Evidence for degree quantification came from ACD, scope relative to intensional operators and the Ellipsis-Scope Generalization. The following section connects the results so far to the core topic of this chapter, the dichotomy between PCs and CCs.

### 3. Direct Analysis vs. Reduction Analysis

Phrasal comparatives (PCs) differ from clausal comparatives (CCs) in that in PCs, the standard marker precedes a single, typically nominal constituent:

(26) a. Ann is be taller than Ben.  (phrasal comparative)

   b. Ann appears to be taller than Ben appears to be.  (clausal comparative)

The constituent following the standard marker than is the REMNANT. Each remnant is paired with
a constituent it contrasts with in the matrix clause, to be referred to as the **CORRELATE** (Heim 1985; also sometimes called **ASSOCIATE** in the literature). In (26)a, for instance, *Ann* is the correlate of the remnant *Ben*.

The cardinal question in the study of phrasal comparatives, to be explored below, has been whether it is possible to systematically reduce all PCs to elliptical versions of CCs or whether syntactic and semantic properties of PCs warrant a special analysis that precludes a derivational relation to their clausal variants. In the literatures, this dispute manifests itself in two opposing positions. On the **REDUCTION ANALYSIS** (RA; Smith 1961; Lees 1961; Chomsky 1965; Bresnan 1973; Lechner 1999, 2004; Bhatt and Takahashi 2007, 2011), all PCs are the product of ellipsis operations targeting an underlying clausal source. *Prima facie*, RA gains plausibility from the observation that degree clauses can be affected by a wide variety of standardly sanctioned ellipsis operations, including Gapping ((27)a), VP-deletion ((27)b), Pseudogapping ((27)c) and Stripping. Stripping, also known as **Comparative Ellipsis** (Bresnan 1975), produces PCs ((27)d; CD, which removes the gradable property, not represented in (27)):

(27)  
\begin{align*}
\text{a. } & \text{Ann visited Berlin more often than Cleo <visited> Dubai.} \\
\text{b. } & \text{Ann visited Berlin more often than Cleo did <[VP visit Berlin]>}. \\
\text{c. } & \text{Ann visited Berlin more often than Cleo did <[VP visit \text{t}_1]> Dubai}_1. \\
\text{d. } & \text{Ann visited Berlin more often than Cleo <visited Berlin>}. \\
\end{align*}

(28) documents that all of these reduction processes are also attested in coordinate structures, in support of the central tenet of RA that degree clauses are legitimate targets for ellipsis:

(28)  
\begin{align*}
\text{a. } & \text{Ann visited Berlin and Cleo <visited> Dubai.} \\
\text{b. } & \text{Ann visited Berlin and Cleo did <[VP visit Berlin]>}. \\
\text{c. } & \text{Ann visited Berlin and Cleo did <[VP visit \text{t}_1]> Dubai}_1. \\
\text{d. } & \text{Ann visited Berlin and Cleo <visited Berlin>, too.} \\
\end{align*}

By contrast, the **DIRECT ANALYSIS** (Hankamer 1973; Napoli 1983; Hoeksema 1983; Heim 1984; Reinhart 1991; Kennedy 1999; a.o.) denies a derivational relationship between PCs and CCs and treats phrasal standards as base-generated constituents introduced by a prepositional version of *than*.

From a theoretical perspective, the decision between DA and RA is relevant inasmuch as it has repercussions for the broader debate of how to resolve mismatches between the syntactic and the semantic component. Whereas adherents of DA typically posit a greater degree of abstractness or irregularity in semantics, keeping syntactic representations relatively simple and surface oriented, proponents of RA usually attempt to limit semantic variation at the cost of more abstract syntactic representations. Naturally, the choice between these options remains motivated mainly by methodological inclinations and ontological proclivities unless supplemented by empirically based, specific analyses - this is the primary objective of the discussion to follow.

A remark regarding the organization of the remainder of this chapter is in order here. Historically, the debate between DA and RA roughly falls into three periods: an early phase, in which research mainly focused on syntactic and morphosyntactic differences between PC vs.
CCs; a period following the introduction of a compositional semantics for PCs (Heim 1985), which made it possible to evaluate theories also according to semantic criteria; and current research, characterized by an increased interest in cross-linguistic variation as well as alternative semantic strategies for modeling PCs (comparison between individual vs. degree). For reasons of perspicuity, the exposition to follow reflects this intellectual history only to a very limited extent, though, anticipating future developments whenever justified by considerations of internal consistency.

3.1. Early period
In general, empirical evidence discriminating between DA and RA derives from three sources: similarities and disparities between the ellipsis processes affecting degree clauses and coordinate structures; (morpho)syntactic restrictions on the standard argument in PCs; and interpretive differences between PCs and CCs. The current section reports core distinguishing features of PCs from all three domains, concentrating on findings from the 1970ies to the 1980ies.

3.1.1. Initial evidence for RA
The first argument for the reduction analysis consists in the fact that the ellipsis processes targeting degree clauses are not only similar to reduction operations in coordinate structures, but observe exactly the same conditions characteristic of conjunction reduction. To exemplify, in comparatives as well as in coordinate structures, Gapping is unable to reach into embedded clauses ((30)b/(29)b) or delete a finite sentence boundary ((30)c/(29)c; Lechner 2004):

(29)  
\begin{enumerate}
\item Some visited Millhouse more often than others <visited> Bart.
\item *Lisa said that some visited Millhouse more often than Otto claimed that others <visited> Bart.
\item *Lisa said that some visited Millhouse more often than Otto <claimed that others visited> Bart.
\end{enumerate}

(30)  
\begin{enumerate}
\item Some visited Millhouse and others <visited> Bart.
\item *Lisa said that some visited Millhouse and Otto claimed that others <visited> Bart.
\item *Lisa said that some visited Millhouse and Otto <claimed that others visited> Bart.
\end{enumerate}

Second, in V2-languages like German, verb ellipsis is prohibited from operating across overt complementizers both in comparatives and coordinate structures (Lechner 2004; Hendriks 1995).

(31)  
\begin{enumerate}
\item Ich glaube daß mehr Leute das Buch lesen als (*daß) △ den Artikel_{ACC} <lesen>.
\begin{itemize}
\item I believe that more people the book read than that the article read
\item ‘I believe that more people are reading the book than the article.
\end{itemize}
\item Ich glaube daß Hans das Buch liest und (*daß) Maria den Artikel_{ACC} <liest>.
\begin{itemize}
\item I believe that H. the book reads and that M. the article reads
\item ‘I believe (that) John is reading the book and Mary the article.
\end{itemize}
\end{enumerate}
Next, the PC (31)a also illustrates the requirement that morphological case marking of the
remnant matches that of the correlate. This is expected on the reduction analysis, which posits
the same hidden structure in degree clauses that is found in analogous conjunctions ((31)b).
Finally, to mention a fourth similarity, comparatives resemble coordinations also in that they
admit ATB-movement. ATB-movement is for instance implicated in the analysis of (32), which
is ambiguous between the two alternative parses (32)a and (32)b:

(32) Someone gave Ann a more expensive present than Ben.
   a. Someone gave Ann a more expensive present than Ben < gave Ben>.
   b. Someone, t_i gave Ann a more expensive present than <t_i gave> Ben.

While (32)a is straightforwardly derived by Stripping, the indefinite in (32)b must have been
removed by ATB-movement, as evidenced by the fact that the missing subject inside the ellipsis
is interpreted as a bound variable. It follows that (32)b is the result of Gapping and ATB-
movement, and not a construction specific process of subject-verb deletion.

Another type of argument for RA derives from conditions on the external distribution of
PCs. As seen in (33), English PCs obligatorily undergo extraposition (Pinkham 1985: 108). The
illformedness of (33)b naturally falls out from the ellipsis analysis, since Gapping ignores
contexts in which the antecedent precedes the Gap, yet remains mysterious for proponents of the
direct account of PCs (see Bhatt and Takahashi 2007 for a possible reply):

(33) a. Unfortunately, more people like Mozart [than <like> Bach].
   b. *Unfortunately, more people [than <like> Bach] like Mozart.

In sum, homologies between coordinate structures and comparatives, some of which have
been collected above, give substance to the claim that all variation in the surface shape of degree
clauses is reducible to standard ellipsis operations. On further evidence for the parallel behavior
of ellipsis in comparatives and coordinate structures see Hendriks (1995) and Lechner (2004).

3.1.2. Initial evidence against RA

While deriving all PCs from CCs by deletion represents the methodologically most attractive
position, it was recognized early on that the radical ellipsis analysis over- as well as
1983; Brame 1983; Napoli 1983; a.o.). To begin with, it is possible to find CCs that cannot be
pruned into well-formed PCs, seemingly indicating that RA overgenerates. Illustrative of these
cases are PCs with expletive remnants ((34)a; Brame 1983).

(34) a. There couldn’t have been any more people than there *<were>.  (\text{ATPC/CC})
   b. There were some good solutions and there *<were> some bad ones

However, (34)a receives a natural explanation once it is taken into consideration that remnants
of Gapping are necessarily focused, irrespective whether they are embedded in comparatives or
coordinate structures ((34)b; for further instances of apparent overgeneration see Lechner 2004).
Conversely, there are also PCs which lack a well-formed underlying clausal source and can therefore, it has been argued, not be the result of reduction operations targeting a sentential degree complement. This group of under-generation arguments includes the observation that reflexive and accusative remnants are exclusively sanctioned in PCs (Hankamer 1973):

(35)  a. Nobody is taller than himself \(<*\text{is}>\).  \((\checkmark \text{PC/\text{XCC}})\)
    b. Ann is taller than me \(<*\text{am}>\).  \((\checkmark \text{PC/\text{XCC}})\)

But the contrasts in (35) present a challenge to RA only as long as it is assumed that all non-phrasal degree complements are full, tensed clauses. If this restriction is lifted, the sister constituent of \(\text{than}\) can be parsed as a small clause, in analogy to the ECM-constructions in (36). Crucially, since small clauses lack tense specification, which is in turn responsible for establishing a binding domain and assigning nominative case, the PCs in (35) receive now an analysis parallel to that of (36) (Lechner 1999, 2004: 181; Pancheva 2006):

(36)  a. Nobody considers \([\text{small clause}\, \text{himself}\, \text{tall}]\).
    b. Ann considers \([\text{small clause}\, \text{me}\, \text{tall}]\).

On this view, small clause PCs consist of a degree predicate, a degree variable and the subject, resulting in a formula. To accommodate type mismatches, the degree variable accordingly needs to be abstracted over (Pancheva 2006), such that the small clause can semantically directly combine with the comparative relation MORE (or a version of \(\text{than}\), as in Pancheva 2006; see 4.1).

(37) \(\ldots\text{MORE (than)}\, [(<\text{d,t}>, [\text{small clause}\, \lambda \text{d}_1 [\text{me d}_1\, \text{tall} (<\text{d},<\text{e},\text{t}>)]])]\)

Independent support for the small clause hypothesis comes from (21)a, repeated below as (38)a, and the narrow ellipsis reading of (38)b. In both examples, the degree complement embeds a bare degree predicate, demonstrating that the CD-site can be subclausal:

(38)  a. Mary met a man older than Sally \(<\text{d-old}>\).
    b. Mary met an older man than Bill \(<\text{d-old man}>\).

In addition to the small clause reading, (38)b also has a wide interpretation that reconstructs the ellipsis as \(\text{than Bill met a d-old man}\). As pointed out by Beil (1997), only the wide ellipsis reading (39)a is subject to the Definiteness Effect (s.a. Lerner and Pinkal 1995):

(39)  a. \(*\text{Sue defeated every stronger contestant than Bill (did) <defeat every d-strong contestant>}.\)
    b. Sue defeated every stronger contestant than Bill \(<\text{d-strong contestant}>\).

This follows, because in (39)a, ACD-resolution imposes a movement requirement on the \(\text{than}\)-phrase that conflicts with the Name Constraint (see fn. 10; Xiang 2005), whereas the base generated small clause PC (39)b can be interpreted \(\text{in-situ}\). Taken together, the considerations
above furnish strong support for the view that PCs can also be interpreted as small clauses, defusing a classic pair of arguments against RA.

Qualitatively different evidence in favor of DA has been adduced on the basis of two further asymmetries between PCs and CCs. First, the purported clausal source of PCs like (40)a is nonsensical. Second, as documented by (40)b, extraction is possible out of PCs only:

(40)  a. She ran faster than the world record (*ran). \( (√PC/¥CC) \)
    b. Who is Ann taller than t (*is). \( (√PC/¥CC) \)

Based on the contrasts in (35) and (40), Hankamer (1973) argues that \textit{than} is ambiguous between a prepositional version, restricted to PCs, and a complementizer which surfaces in CCs only. Again, these objections against RA have not gone unchallenged. And just like above, the response rests on the hypothesis that PCs can also be construed as non-elliptical small clauses. In (40)a, \textit{the world record} presumably serves as the subject of an empty, contextually specified degree predicate like \textit{10 seconds} or \textit{15 mph} (see below (13); Heim 1985; Lechner 2004; Pancheva 2006). Since RA does not deny the existence of small clause complements, the problem disappears. As noted in Pancheva (2006), the possibility of remnant extraction (40)b also falls out from the small clause analysis, because it effectively treats PC-remnants as ECM subjects, and ECM subjects are known to be mobile. Further diagnostics for the presence of structure inside PCs will be introduced in 3.3. But first, it needs to be determined how the direct account maps PCs onto their model theoretic representations.

3.2. Intermediate period

Base generated PCs cannot be handled by the degree head \textit{MORE} in (13) because the binary operator \textit{MORE} selects for a degree predicate, and not an individual term, as its first argument. It has therefore been proposed that the grammar includes a second, alternative comparative degree head \textit{MORE}_{PC} for the compositional translation of PCs, a current definition of which is given in (41) (Hoeksema 1983; Heim 1985; Kennedy 1999, 2009; Bhatt and Takahashi 2007, 2011).\footnote{Heim’s (1985) formulation in (i) is derived from (i) by right-to-left Currying. Alternative, equivalent definitions of (41) include (ii) ((ii)b from Bhatt and Takahashi 2011: 585):}

\begin{equation}
\text{MORE}_{PC} = \lambda x.\lambda g.\langle d,<e,,t,\rangle.\lambda y.\text{MAX}(\lambda d.g(d)(x)) < \text{MAX}(\lambda d.g(d)(y))
\end{equation}

The sample derivation (42) illustrates the semantic contribution of \textit{MORE}_{PC} in predicative PCs:

\begin{align*}
\text{(41)} & \quad [\text{MORE}_{PC}] = \lambda x.\lambda g.\langle d,<e,,t,\rangle.\lambda y.\text{MAX}(\lambda d.g(d)(x)) < \text{MAX}(\lambda d.g(d)(y)) \\
\text{(42)} & \quad \text{The sample derivation (42) illustrates the semantic contribution of MORE}_{PC} \text{ in predicative PCs:}
\end{align*}
a. Ann is taller than Ben.
b. LF: Ann is \( [\text{MORE}\text{PC than Ben}] \)
c. \( [\text{MORE}\text{PC}] (\text{Ben}) (\text{tall}) (\text{Ann}) = \lambda x, \lambda g_{d,<e,t}, \lambda y_e. \text{MAX}(\lambda d.g(d)(x)) < \text{MAX}(\lambda d.g(d)(y)) (\text{Ben})(\lambda d \lambda x. \text{tall}(d)(x)) = \text{MAX}(\lambda d. \text{tall}(d)(\text{Ben})) < \text{MAX}(\lambda d. \text{tall}(d)(\text{Ann})) \)

d. If, alternatively, the comparison relation is assumed to be located in the standard marker \textit{than}, a position defended in Alrenga et al. (2012; see 2.2), the entry for the phrasal degree head is as in (43):

\begin{align*}
(43) \quad [\text{THAN}\text{PC}] &= \lambda x, \lambda g_{d,<e,t}, \lambda y_e. \sup(\lambda d.g(d)(x)) < \sup(\lambda d.g(d)(y)) 
\end{align*}

On this particular conception, one is led to expect that in languages that distinguish PCs from CCs in the shape of the standard marker, the choice between the clausal and phrasal operator is reflected by changes in morphological exponence. Such correlations are, among others, attested in Greek, Russian, Polish and Bulgarian (on Slavic see Pancheva 2006).

In Greek, for instance, the accusative assigning preposition \textit{apo}/*from’ is used in PCs ((44)a), while CCs are introduced by the free relative marker \textit{ap’oti}/*from what’ ((44)b; Xeila-Markopoulou 1986; Merchant 2009):

\begin{align*}
(44) \quad \text{a. Ine adinato na ine o Giannis psilo-ter-os} & \quad \text{is impossible NA is the Giannis tall-er} \\
& \quad \text{apo afton / ton eauto-tu.} \\
& \quad \text{than phrasal him_{ACC} / the himself_{ACC}} \\
& \quad \text{‘It is impossible that Giannis is taller than him/himself.’} \\
\text{b. Ine adinato na ine o Giannis psilo-ter-os} & \quad \text{is impossible NA is the Giannis tall-er} \\
& \quad \text{ap’oti ine aftos /*/o eautos-tu.} \\
& \quad \text{than clausal what is him_{NOM} /the himself_{NOM}} \\
& \quad \text{‘It is impossible that Giannis is taller than him/himself.’}
\end{align*}

It does not come as a surprise that case and binding properties co-vary with the choice of \textit{than}: in PCs with \textit{apo}, the remnant is assigned accusative and can be a reflexive bound from outside ((44)a). If the PC is on the other hand introduced by \textit{ap’oti}, the remnant bears nominative but must not contain an anaphor ((44)b). This cross-linguistic difference is compatible with two conclusions. First, Greek might have access to both the base generation and the ellipsis strategy to the formation of PCs (see Merchant 2009 for discussion). Second, paradigms like (44) exemplify the typological generalization that in languages which overtly distinguish PCs from CCs, the locus of morphological variation is the standard marker \textit{than}, and not the degree head. This dovetails with Alrenga et al. (2012)’s proposal, according to which the comparison relation and therefore the choice between the two-place clausal and the three place phrasal operator, is encoded in the standard marker.
3.2.1. Attributive PCs and parasitic scope

Thus far, it has been demonstrated that the ternary comparative operator $\text{MORE}_{\text{PC}}$ derives the correct results in predicative constructions. Attributive PC such as (45)a require some additional covert re-organization of the tree, though, to ensure a transparent progression from syntax to semantics. Otherwise, the constituent made up of $\text{MORE}_{\text{PC}}$ and the $\text{than}$-phrase would not be able to find a suitable degree-individual relation $\langle d, \langle e, t \rangle \rangle$ to apply to. As detailed by the derivation tree (45)b, the correlate $\text{Ann}$ therefore undergoes QR first, followed by movement of the unit $\text{MORE}_{\text{PC}}$ than $\text{Ben}$ (= $\alpha$) to a position inbetween the correlate and its $\lambda$-binder, resulting in a configuration of ‘parasitic scope’ (Sauerland 1998; Nissenbaum 1998; Beck and Sauerland 2000; Barker 2007; Lechner 2007). Hence, parasitic scope is a precondition for supplying $\text{MORE}_{\text{PC}}$ with the correct degree-individual relation as its second argument (Kennedy 2007; Bhatt and Takahashi 2007, 2011: 585):

\begin{enumerate}
  \item \textbf{a.} $\text{Ann}_{\text{correlate}}$ read a better poem than $\text{Ben}_{\text{remnant}}$
  \item \textbf{b.} LF:
    \begin{enumerate}
      \item \text{Ann}_{\text{correlate}}
      \item $\alpha_{\langle d, \langle e, t \rangle \rangle, \langle e, p \rangle}$
      \item $\text{TP}_{\langle d, \langle e, p \rangle \rangle}$
    \end{enumerate}
  \item \text{\textbf{c.} [\text{MORE}_{\text{PC}}] ([\text{Ben}]) ([\lambda_2 \lambda_1 \text{read a d}_2\text{-good poem}]) ([\text{Ann}])} =
  \item \text{d.} $\text{MAX}(\lambda d. \text{Ben read a d-good poem}) < \text{MAX}(\lambda d. \text{Ann read a d-good poem})$
\end{enumerate}

Parasitic scope is also implicated in the formation of subject comparatives, as revealed by the derivation of LF (46)b. Again, at LF, the correlate ($\text{LGB}$) moves first and the comparative tucks-in, driven by the need to generate a suitable two-place relation that serves as the input for the semantic computation.

\begin{enumerate}
  \item \textbf{a.} More people read LGB than the MP.
  \item \textbf{b.} LF: $[\text{LGB} [\text{\textbf{c.} [\text{MORE}_{\text{PC}} \text{than the MP}] \langle d, \langle e, t \rangle \rangle \lambda_2 \lambda_1 \text{[TP d}_2\text{-many people read t}_1\text{]}]}]]$
  \item \text{\textbf{c.} [\text{MORE}_{\text{PC}}] ([\text{the MP}]) ([\lambda_2 \lambda_1 \text{d}_2\text{-many people read t}_1]) ([\text{LGB}])} =
  \item \text{d.} $\text{MAX}(\lambda d. \text{d}-many people read MP) < \text{MAX}(\lambda d. \text{d}-many people read the LGB})$
\end{enumerate}

The analysis is, Heim (1985) shows, corroborated by the observation that the two covert movement processes hypothesized by DA respond to island diagnostics. In (47), for one, the comparative operator $\text{FEWER}$ is trapped inside a relative clause, resulting in strong ill-formedness:
(47) a. *[DP Someone [CP who could answer few questions] made a good impression on Bill than on Fred. [Heim 1985, 25: (39)]
   b. *[IP Bill [[FEWERPC (on) Fred] [λ₂ λ₁ [[DP someone [CP who could answer *d₂-many questions]] made a good impression on t₁]]]]

Furthermore, the deviance of (48) is explained if correlates have to covertly raise to the scope position of the comparative operator, and if this movement is regulated by syntactic locality:

(48) a. ?*I spent more time with [DP a woman [CP that played the clarinet]] than the lute.
   b. [the clarinet [[MOREPC than the lute] [λ₂ λ₁ I spent d₂-much time with [DP a woman [CP that played *t₁] than t₂]]]]
   [Heim 1985, 26: (52)]

Note at this point, though, that (47) and (48) are also amenable to a reduction analysis, as made explicit by their underlying sources in (49). In both instances, Gapping illicitly targets a string that includes a finite clause boundary, incurring a violation of the conditions on Gapping (cf. (29)c; Lechner 2004). This neutralizes a potential argument in favor of DA.¹⁴

(49) a. *Someone [CP who could answer fewer questions] made a good impression on Bill than <t₁ [CP who could answer d-many questions] made a good impression> on Fred.
   b. *I spent more time with a woman that played the clarinet than <I spent d-much time with a woman that played> the lute.

Thus, locality conditions on the comparative operator and the correlate do not aid in deciding between the two competing PC-analyses.

The LF-representations discussed above expose yet another criterial property of DA, though, which will be seen to elicit an argument against base-generation: derivations based on MOREPC assign identical scope to the correlate and the comparative relation. This particular characteristic of the analysis presents a problem for the base-generation account in constellations where PCs scopally interact with modals, as in (50) (cf. (11)). Sentence (50) admits an inverse interpretation, which requires the minimal length of the paper to exceed the actual length of the draft by 10 pages ((50)a). Under the reduction analysis, the derivation of this reading is uneventful and proceeds along the lines of the LF in (50)b. By contrast, the direct account, the LF of which is given in (50)c, cannot produce the target interpretation (50)a, because the modal is - by the definition of MOREPC - also converted into the standard argument, resulting in the semantic computation (50)d. Even though (50)d is also a possible interpretation, roughly paraphrasable as The paper must be exactly 5 pages longer than the draft must be, it is not the desired one. Thus, the existence of reading (50)a poses a challenge for DA:

¹⁴The than-phrase in (47) has also been illegitimately extraposed from an island. Interestingly, the non-extraposed variants are rated if anything even worse:

(i) * Someone [CP who could answer fewer questions than on Fred] made a good impression on Bill.
(ii) *I spent more time than the lute with a woman that played the clarinet.

This is unexpected for DA, but not for RA, on which ellipsis operates on extraposed degree clauses.
The paper is required to be exactly 5 pages longer than the draft.

\[ a. \lambda w. \max (\lambda d. \text{the draft is } d\text{-long in } w) + 5 < \max (\lambda d. \forall w' \in \text{Acc}_\text{Decl}(w)(w') \rightarrow \text{the paper is } d\text{-long in } w') \]

\[ b. [\text{[exactly 5 pages MORE than the draft]}] < \text{[the paper]} < \text{[the draft]} < \lambda_2 \lambda_1 \text{ required } t_1 \text{ to be } d_2\text{-long}] \]

\[ c. [\text{the paper [exactly 5 pages MORE than the draft]}] < \text{the paper} < \lambda_2 \lambda_1 \text{ required } t_1 \text{ to be } d_2\text{-long}] \]

\[ d. [\text{MORE}_{\text{PC}}] ([\text{the draft}] < \lambda_2 \lambda_1 \text{ required } t_1 \text{ to be } d_2\text{-long}] ([\text{the paper}]) = \lambda w. \max (\lambda d. \forall w' \in \text{Acc}_\text{Decl}(w)(w') \rightarrow \text{the draft is } d\text{-long in } w') + 5 < \max (\lambda d. \forall w' \in \text{Acc}_\text{Decl}(w)(w') \rightarrow \text{the paper is } d\text{-long in } w') \]

It can be concluded that some PCs with individual standards have to be treated as reduced clausal comparatives. This also has a potentially important typological consequences: if constructions analogous to (50) are attested in a language, this language has (at least limited) access to RA.

### 3.2.2. Russell sentences

Another classic, striking interpretive contrast between CCs and PCs manifests itself in ‘Russell’s yacht-sentences’ (Russell 1905). (51) is ambiguous between a contradictory, opaque de dicto interpretation and a sensible, transparent de re reading for the elided predicate *is tall* (Russell 1905; von Stechow 1984; Heim 1985; Larson 1988; Rullmann 1995, a.o.; AccBelA returns for each world alternative for Ann).

\[ (51) \text{ Ann believes that Ben}_1 \text{ is taller than he}_1 \text{ is.} \]

\[ a. \lambda w. \forall w' \in \text{Acc}_\text{BelA}(w)(w') \rightarrow \max (\lambda d. \text{he}_1 \text{ is } d\text{-tall in } w') < \max (\lambda d. \text{Ben}_1 \text{ is } d\text{-tall in } w') \text{ (contradictory de dicto)} \]

\[ b. \lambda w. \forall w' \in \text{Acc}_\text{BelA}(w)(w') \rightarrow \max (\lambda d. \text{he}_1 \text{ is } d\text{-tall in } w') < \max (\lambda d. \text{Ben}_1 \text{ is } d\text{-tall in } w') \text{ (sensible de re)} \]

There are two prominent positions on this ambiguity: scoping of the *than*-phrase and non-local binding of world/situation variables (‘double indexing’; Postal 1974). Compelling evidence against treating transparent readings in terms of an exportation mechanism like QR is supplied by apparent scope paradoxes ((52)a; Hoeksema 1983; Rullmann 1985; a.o.). In (52)a, the degree complement contains a pronominal variable bound by a quantifier below the propositional attitude operator, yet the sentence admits a sensible de re interpretation. Thus, the scope of the degree clause must be limited to the lower clause, with the consistent reading being produced by abstracting over the predicate’s world variable at the matrix level, as in (52)b.\(^{15}\) As for the specific implementation of the analysis, it will be assumed that gradable adjective denotations are of type \(<d,<s,<e,t>>\), and that the world/situation pronoun which serves as the second

\[^{15}\text{Alternatively, one might consider avoiding the scope paradox by exceptional, long QR of the binder (nobody) into the higher clause. This generates the prediction, though, that movement is also reflected in new wide scope options. (i) documents that this expectation is not borne out:} \]

\[ (i) \]

\[ a. \text{ It seemed to someone that everybody}_1 \text{ is taller than he}_1 \text{ is.} \quad (\exists \rightarrow \forall/\forall \rightarrow \exists) \]

\[ b. \text{ Everybody}_1 \text{ seemed to someone } t_1 \text{ to be taller than he}_1 \text{ is.} \quad (\exists \rightarrow \forall/\forall \rightarrow \exists) \]
argument of the adjective is hosted by the copula to be (Heim 1985; Keshet 2010: 403; QR of degree quantifier ignored).

(52)  
   a. John believes that nobody is taller than he is.  
   b. \( \lambda w [\text{John believes that } \lambda w' [\text{ nobody is taller than he is } w] <\text{d-tall}>] \)

From the above, it follows that the ambiguity in (51) is resolved by different choices for the \( \lambda \)-binder of the world variable inside the degree clause. Relevant portions of the two LFs are spelled out in (53):

(53)  
   a. \( \text{LF for contradictory de dicto reading of (51)} \)  
      \( \lambda w [\text{Ann believes that } \lambda w' [\text{Ben is taller than he is } w] <\text{d-tall}>] \)
   b. \( \text{LF for sensible de re reading of (51)} \)  
      \( \lambda w [\text{Ann believes that } \lambda w' [\text{Ben is taller than he is } w] <\text{d-tall}>] \)

What is of particular interest for present concerns is that Russell ambiguities can, at least in more complex constellations, be used to discriminate between the two competing accounts of PCs.

Attending to simpler manifestations first, it is well-known that PCs with reflexive remnants, exemplified by (54), sanction only the inconsistent, opaque reading (54)a (McCawley 1967; Hellan 1981; Napoli 1983; Heim 1985; a.o.):

(54)  
   Ann believes that Ben is taller than himself.  
   \( \lambda w. \forall w' \in \text{Acc}_{\text{Bel}}(w)(w') \rightarrow \)
   a. \( \text{MAX}(\lambda d. \text{himself is } d\text{-tall in } w') < \text{MAX}(\lambda d. \text{Ben is } d\text{-tall in } w') \quad (\text{de dicto}) \)
   b. \( \text{MAX}(\lambda d. \text{himself is } d\text{-tall in } w) < \text{MAX}(\lambda d. \text{Ben is } d\text{-tall in } w') \quad (\text{de re}) \)

Heim (1985) observes that the absence of the sensible de re interpretation (54)b is a corollary of the natural assumption that ellipsis parallelism requires the world variable implicit in the elided verb \( (\text{is}) \) to match its antecedent. Since the index of the main predicate is locally bound by the abstractor right below the propositional attitude operator (Percus 2000: 201), the world variable inside the elided part of the degree clause needs, as detailed in (55), to be locally identified, too:

(55)  
   \( \lambda w [\text{Ann believes } \lambda w' [\text{Ben is taller than himself } w'] <\text{is}_{w'} <w} d\text{-tall}>] \)

But Heim also points out that the de re reading can be just as effectively be excluded on the direct analysis, which assigns to the reflexive example (54) the representation (56)a. In (56)a, the correlate and MORE\(_{PC} \) have moved locally, resulting in the de dicto proposition derived in (56)b. Moreover, provided that one were to admit long QR, the direct analysis also produces the alternative LF (56)c, in which the comparative operator and the correlate are attached at the matrix clause level. But since the scope of MORE\(_{PC} \) now contains the propositional attitude, the translation in (56)d again yields an inconsistent belief, instead of the absent de re interpretation.
(presupposing that each world supplies only a single doxastic accessibility relation for Ann.)

(56) a. **DA-1: narrow scope de dicto reading**
\[ \lambda w [\text{Ann believes that } \lambda w'[\text{Ben ]] \left[ \lambda _2 \lambda _1 [t_1 \text{ is } d_2 \text{-tall}]]]] \]

b. \[(56) a] = [\text{believes}][[[\text{MORE}_{\text{PC}}]]][\text{[himself]}][\left(\lambda _2 t_1 d_2 \text{-tall}\right)][\text{[Ben]}][\left(\text{[Ann]}\right)] = \]
\[ \lambda w. \text{MAX}(\lambda d. \forall w' \in \text{Acc}_{\text{Bel},\text{A}}(w)(w') \rightarrow \text{himself},_i \text{ is } d \text{-tall in } w') < \text{MAX}(\lambda d. \text{Ben},_i \text{ is } d \text{-tall in } w') \]

c. **DA-2: wide scope de dicto reading**
\[ \lambda w [\text{Ben }] \left[ \lambda _2 \lambda _1 [\text{Ann believes that } \lambda w'[t_1 \text{ is } d_2 \text{-tall}]]]] \]

d. \[(56) c] = [\text{MORE}_{\text{PC}}][\text{[himself]}][\left(\lambda _2 t_1 \text{ Ann believes } d_1 \text{-tall}\right)][\text{[Ben]}][\left(\text{[Ann]}\right)] = \]
\[ \lambda w. \text{MAX}(\lambda d. \forall w' \in \text{Acc}_{\text{Bel},\text{A}}(w)(w') \rightarrow \text{himself},_i \text{ is } d \text{-tall in } w') < \text{MAX}(\lambda d. \forall w' \in \text{Acc}_{\text{Bel},\text{A}}(w)(w') \rightarrow \text{Ben},_i \text{ is } d \text{-tall in } w') \]

It can be concluded that RA and DA are equally well equipped to handle the absence of *de re* readings with reflexive remnants in (54).

Note in passing that examples with reflexive PC-remnants analogous to (54) are sharply ungrammatical in German ((57)a). Instead, reflexive readings are expressed by the focus anaphor *er selbst*/*he himself* ((57)b). (57)b only admits the contradictory interpretation:

(57) a. *Anne glaubt, das Ben größer (als sich) ist (als sich).*
   Ann believes that Ben taller than himself is than himself
b. Anne glaubt, das Ben größer (als er selbst) ist (als er selbst).
   Ann believes that Ben taller than he himself is than he himself

At first sight, it is tempting to relate the ill-formedness of (57) to the two assumptions that (i) reflexives move for reasons of interpretation (Lechner 2012) and that (ii) German lacks preposition stranding. This analysis is contradicted, though, by the observation that reflexive PC-remnants are attested in other non-preposition stranding languages, among them Greek:

(58) Kanenas den ine psiloteros apo ton efto tu. [Merchant 2010: (12)]
   nobody not is taller than\text{phrasal} the himself\text{ACC}
   ‘Nobody is taller than himself.’

According to Heim, the restriction operative in (54) is expressed in terms of conditions on ellipsis, and does not make reference to the fact that the remnant is a reflexive. Thus, one is led to expect that PCs more generally lack transparent *de re* readings for the degree predicate. This also implies that the interpretation of the predicate should not be dependent on whether the remnant is referentially transparent or opaque. Elaborating on Heim (1985), I will remark on some consequences of this prediction. To anticipate, these complex interactions between the

---

16 By the same reasoning, overt raising in examples like (i)a, followed by covert correlate movement ((i)b), should unambiguously yield the contradictory *de dicto* reading. This appears to be correct.

(i) a. John seems to be taller than himself. *(contradictory de dicto only)*
   
   b. [John [[MORE_{PC} than himself]] \left[ \lambda _2 \lambda _1 [t_1 d_2 \text{-tall}]]]

---

22
interpretation of the remnant and the predicate, while challenging native speaker’s intuitions, also appear to favor the reduction analysis.

Assume the following scenario for the PC in (59). Ann, who suffers from amnesia, is married to Ben but mistakenly believes that her husband is John. Moreover, she is of the firm conviction that Ben is the tallest man she has ever met.

(59) Ann believes that Ben is taller than her husband.

a. \( \lambda w. \forall w' \in \text{Acc}_{\text{Bel-A}}(w)(w') \rightarrow \) (consistent de dicto - de dicto, \([\text{true}]\))
\[ \text{MAX}(\lambda d. \text{Ann’s husband in } w' \text{ is } \text{d-tall in } w') < \text{MAX}(\lambda d. \text{Ben}_1 \text{ is } \text{d-tall in } w') \]

b. \( \lambda w. \forall w' \in \text{Acc}_{\text{Bel-A}}(w)(w') \rightarrow \) (contradictory de re - de dicto)
\[ \text{MAX}(\lambda d. \text{Ann’s husband in } w \text{ is } \text{d-tall in } w') < \text{MAX}(\lambda d. \text{Ben}_1 \text{ is } \text{d-tall in } w') \]

Given this setup, (59) is evaluated as true on the de dicto interpretation of her husband formalized in (59)a, because Ann indeed believes that Ben exceeds John (her alleged husband) in height. Moreover, if the remnant is read de re, the sentence expresses the inconsistent proposition (59)b that in Ann’s belief worlds, her actual husband Ben is taller than Ben. As it turns out, the existence of such a mixed de re - de dicto interpretation is again compatible with the reduction as well as the base generation approach. On both analyses, variation in referential transparency of the remnant can be related to the choice of the world variable binder. Relevant parts of the LFs underlying these remnant de re readings are shown in (60):

(60) a. RA: consistent mixed de re - de dicto
\[ \lambda w [\text{Ann believes that } [\lambda w' \text{ Ben is tall}_{w'} [\text{MORE than her husband}_{w'} < \text{is}_{w'} \text{ d-tall}]]] \]

b. DA: consistent mixed de re - de dicto
\[ \lambda w [\text{Ann believes that } \lambda w' [\text{Ben [MORE}_{PC} \text{ than her husband}_{w'} [\text{is}_{w'} \text{ d-tall}]][\text{MORE}_{PC} \text{ than her daughter}_{w'} [\text{is}_{w'} \text{ d-tall}]]] \]

While combinations of de re and de dicto remnants with de dicto predicates are empirically attested, it is less clear whether the same holds of PCs in which the missing predicate is interpreted transparently de re. In the literature, such constellations have been argued to be absent (Napoli 1983; Heim 1985; McCawley 1998: 713). However, the subtlety of the judgements involved makes the validation of this claim difficult.

Consider (61) in the following context, which is intended to help in detecting de re predicates: Ben has a younger sister, Daisy. At a Halloween party, Daisy dresses up as her mother Cloe, and Cloe dresses up as her daughter Daisy. Due to the skills of a good make up artist, Ann mistakes Daisy for Cloe and vice versa. In this scenario, (61) is evaluated as false on the de re - de re interpretation (61)a, but is verified by the de dicto - de re reading (61)b. To see the truth conditional difference between (61)a and (61)b more clearly, table (62) spells out some facts of the scenario (presupposing that (61) is evaluated in \( w_0 \)):
(61)  Ann believes that Ben₁ is older than his₁ mother.

(Control: Ann believes that Ben₁ is older than his₁ mother is.)

a. $\lambda w. \forall w' \in \text{Acc}_{\text{Rel-A}}(w)(w') \rightarrow (\text{de re - de re}, [\text{false in (62)}])$

$$\text{MAX}(\lambda d. \text{Ben’s mother in } w \text{ is } d\text{-old in } w) < \text{MAX}(\lambda d. \text{Ben₁ is } d\text{-old in } w')$$

“Ann believes that Ben₄₀ is older than Cloe₇₀.”

b. $\lambda w. \forall w' \in \text{Acc}_{\text{Rel-A}}(w)(w') \rightarrow (\text{de dicto - de re}, [\text{true in (62)}])$

$$\text{MAX}(\lambda d. \text{Ben’s mother in } w' \text{ is } d\text{-old in } w) < \text{MAX}(\lambda d. \text{Ben₁ is } d\text{-old in } w')$$

“Ann believes that Ben₄₀ is older than Daisy₃₀.”

<table>
<thead>
<tr>
<th>(62)</th>
<th>Ben’s mother</th>
<th>Ben’s age</th>
<th>Cloe’s age</th>
<th>Daisy’s age</th>
</tr>
</thead>
<tbody>
<tr>
<td>$w₀$</td>
<td>Cloe</td>
<td>40</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>$w₁$</td>
<td>Daisy (Ben’s younger sister)</td>
<td>40</td>
<td>30</td>
<td>70</td>
</tr>
</tbody>
</table>

Speakers vary with respect to whether they accept (61) as a description of (62). If the existence of such readings can be substantiated, though, they contribute an argument against the direct analysis. This is so because on DA, the representation of PCs does not contain a predicate, and therefore also lacks a world variable that could be bound at a distance. Interestingly, German examples analogous to (61) appear to admit de re readings for the predicate. Moreover, in Greek, which morphologically distinguishes between two versions of PCs, arguably base generated apo-PCs cannot be interpreted de re, while reduced ap’oti-PCs marginally have - at least for some speakers - the intended interpretation:

(63)  a. I Maria pistevi oti o Iannis ine megaliteros ap’oti ine i mitera tu.
the Maria believes that the Iannis is older than his the mothernom his

b. ??I Maria pistevi oti o Iannis ine megaliteros ap’oti i mitera tu.
the Maria believes that the Iannis is older than hisnom the mothernom his

c. *I Maria pistevi oti o Iannis ine megaliteros apo tin mitera tu.
the Maria believes that the Iannis is older than hisacc the motheracc his

‘Mary believes that John is taller than his mother (is).’ (de dicto/de re - de re)

A more careful empirical investigation of the claim that Russell PCs also admit transparent predicate readings has to await another occasion, though. To the extent that such interpretations exist, they provide evidence for the reduction analysis. Fortunately, as will become evident in the sections to follow, interpretive properties also provide the basis for more reliable diagnostics probing the presence or absence of hidden structure inside phrasal degree complements.

17 Heim (1985: 15 and footnote 12) and Napoli (1983) discuss missing transparent readings for the degree predicate on the basis of examples like (i). Examples with more descriptive content, as used in the main text, are somewhat easier to judge, though - and also appear to elicit more liberal results:

(i)  a. $\lambda w [\text{Ann believes that } \lambda w'[\text{Ben is taller than Carl } \text{is}_w / w' < \text{d-tall}]]$

b. $\lambda w [\text{Ann believes that } \lambda w'[\text{Ben is taller than Carl } < \text{is}_w / w' \text{d-tall}]]$
3.2.3. Disjoint reference effects

Restrictions on admissible coreference relations furnish a strong argument for the ellipsis analysis in some languages, including English and German, and favor the direct account for others, among them Hindi-Urdu and Japanese. The nature of the evidence is similar to the data introduced in the discussion of the Ellipsis-Scope Generalization in section 2.4.

To begin with, the absence of disjoint reference effects in (64) suggests that PC-remnants are not c-commanded by constituents of the matrix clause (Lechner 2004; (64)a/b from Bhatt and Takahashi [henceforth BT] 2011: (11)):

(64) a. Mary gave him$_1$ more presents than [John$_i$’s mother]$_{NOM}$.
   (= Mary gave him$_1$ more presents than John$_i$’s mother gave him$_1$.)

b. Mary gave more presents to him$_1$ than [John$_i$’s mother]$_{NOM}$.
   (= Mary gave more presents to him$_1$ than John$_i$’s mother gave to him$_1$.)

c. He$_i$ gave us more presents than [John$_i$’s mother]$_{NOM}$.
   (= He$_i$ gave us more presents than John$_i$’s mother gave us.)

However, this impression does not survive exposure to a wider range of examples. As documented by the contrast in (65), the grammar imposes strict formal conditions on possible coreference relations, made explicit in the generalization in (66) (BT 2011: (10), building on Lechner 2004):

(65) a. Sally introduced him$_i$ to more friends than [Peter$_i$’s sister]$_{NOM}$.
   (= Sally introduced him$_i$ to more friends than Peter$_i$’s sister introduced him$_i$ to.)

b. *He$_i$ introduced Sally to more friends than [Peter$_i$’s sister]$_{ACC}$.
   (= He$_i$ introduced Sally to more friends than he$_i$ introduced Peter$_i$’s sister him$_i$.)

(66) Every node that c-commands the correlate also c-commands the remnant.

Of particular significance for present purposes is the fact that (66) is a direct consequence of the hypothesis that the degree clause contains hidden elliptical structure, as posited by RA (Lechner 2004: 214). To illustrate, in (65)a, the pronoun him$_i$ is located below the correlate (Sally) and accordingly does not c-command the name in the parallel elliptical representation, either (Peter$_i$’s sister introduced him$_i$ to d-many friends). If on the other hand, the correlate is located above the pronoun, as in (65)b, the name ends up in the c-command domain of the coindexed pronoun in the reconstructed source (he$_i$ introduced Peter$_i$’s sister to d-many friends), inducing a disjoint reference effect.

The direct account is less successful than the ellipsis analysis, as it generates two LFs, shown in (67), which are indistinguishable with respect to the relevant c-command relations. In (67), both moved constituents adjoin at the sentence (TP) level, above the derived position of the subject, thereby neutralizing hierarchical differences between the correlate and the remnant.
(67) a. [\text{TP Sally [\text{TP} [\text{MORE}_{PC} \text{ than Peter},'s sister] [\lambda_2 \lambda_3 [\text{TP} t_3 \text{ introduced him}, \text{ to d}_2 \text{-many friends}]}}]]

b. [\text{TP Sally [\text{TP} [\text{MORE}_{PC} \text{ than Peter},'s sister] [\lambda_2 \lambda_3 [\text{TP} \text{he}, \text{ introduced t}_3 \text{ to d}_2 \text{-many friends}]}}]]

However, BT (2007) point out that there is an alternative parse for (65), shown in (68), which locates the parasitic scope relation at the vP instead of the TP level, thereby drawing the correct distinctions between (65)a and (65)b. Moreover, the low attachment alternative (68) should be preferred over (67) as it aligns better with Scope Economy (Fox 2000):

(68) a. [\text{TP Sally [\text{vP} [\text{MORE}_{PC} \text{ than Peter},'s sister] [\lambda_2 \lambda_3 [\text{vP} t_3 \text{ introduced him}, \text{ to d}_2 \text{-many friends}]}}]]

b. *[\text{TP He, } \lambda_1 [\text{vP Sally [\text{vP} [\text{MORE}_{PC} \text{ than Peter},'s sister] [\lambda_2 \lambda_3 [\text{vP} t_1 \text{ introduced t}_3 \text{ to d}_2 \text{-many friends}]}}]]]

The essence of the argument against DA remains unaffected, though, as BT note. Once the pronoun and the correlate have been migrated into the VP-domain, as is done in (69) and (70), the structural differences between licit and illicit coreference patterns disappear again. In all four LF-representations, the pronoun fails to c-command the name:

(69) a. More people talked to Sally about him, than to Peter,‘s sister. [\text{BT: (12)}]

b. *More people talked to him, about Sally than about Peter,‘s sister.

(Control: More people talked to Peter, about Sally than about his, sister.)

(70) a. Mary introduced him, to more people than John,‘s mother. [\text{BT: (11)}]

b. *More people introduced him, to Mary than to John,‘s mother.

(Control: More people introduced John, to Mary than to his, mother.)

Hence, the conclusion remains the same as before: (66) resists a satisfactory analysis on the base generation theory, but falls under the purview of the ellipsis account.

BT further report that analogous structures to (69)b and (70)b are well-formed in Hindi-Urdu and Japanese, demonstrating that not all languages treat PCs alike. More specifically, the availability of coreference in (71) and (72) signals that in these languages, PCs are not necessarily derivationally related to elliptical clausal comparatives:
Observations about restrictions on complementation and quantifier scope furthermore document that Japanese and Hindi-Urdu PCs not only can, but have to be assigned the parses envisioned by the direct analysis. Strong evidence to this end is provided by the fact that in Hindi-Urdu, ellipsis exclusively operates on finite clauses. Moreover, comparative complements are introduced by the particle -se, which exclusively combines with non-finite clauses. Given that degree clauses cannot be targeted by ellipsis, Hindi-Urdu PCs are only compatible with the tenets of DA. To determine the status of Japanese PCs requires additional information, though, to be attended to below.

3.2.4. Quantifier scope

Quantifiers inside degree complements are known to be subject to intricate conditions regulating their scope with respect to other operators in the sentence (Heim 2006; Beck 2011; Alrenga and Kennedy 2014 and references therein). For instance, (73) can only be understood with wide scope of the quantificational remnant with respect to the comparative relation ((73)a). Embedding the distributive DP inside the maximality operator, as in (73)b, results in weak truth conditions that would already be satisfied if John exceeded the smallest boy’s height:

(73) John is taller than every boy in his class.
   a. $\forall x[\text{boy}(x) \rightarrow \text{max}(\lambda d. x\text{ is } d\text{-tall}) < \text{max}(\lambda d.\text{John is } d\text{-tall})]$
   b. $\text{max}(\lambda d.\forall x[\text{boy}(x) \rightarrow x\text{ is } d\text{-tall}]) < \text{max}(\lambda d.\text{John is } d\text{-tall})$

BT add a further curious property to the catalogue of intriguing scope phenomena that has been assembled in the literature. In PCs with quantificational object remnants and quantificational correlates, the comparative appears to accept wide scope only:

(74) More students read every syntax paper than every semantics paper. (= More students read every syntax paper than read every semantics paper.)
   a. $\left[\text{more}\ [\lambda_1\ \text{than}\ d_1\text{-many students read every semantics paper}][\lambda_2\ (\text{more } \forall)\ [d_2\text{-many students read every syntax paper}]]\right]$
   “The number of students who read every syntax paper exceeds the number of students who read every semantics paper.”
b. \[
\text{[[every syntax paper] \[\lambda_3 \text{[[every semantics paper] \[\lambda_4 \text{[[MORE}\lambda_1 \text{than d}_1\text{-many students read } t_3]]]\[\lambda_2 \text{[d}_2\text{-many students read } t_1]]]]]]]}
\]

“Every syntax paper was read by more students than every semantics paper.”

Narrow scope inside the standard argument arguably requires a clausal structure, which BT take to support the claim that English has access to the reduction strategy only. In Hindi-Urdu and Japanese, the scope judgements are exactly the reverse. This receives, the authors note, a natural explanation on the base generation account as follows: the three-place operator \text{MORE}_{PC} selects for an individual term as its first argument. Hence, quantificational standard arguments have to QR to avoid a type conflict. But since the first possible landing site (node of type t) is above the LF-position of the correlate, which is in turn higher than \text{MORE}_{PC}, the quantifier is correctly predicted to be unambiguously assigned wide scope:

\[
(75) \quad \left[QP_3 \left[\text{ correlate \[<_{e,t} \text{[MORE}_{PC} \text{ than } t_3]\[<_{d,<e,t>} \left[\lambda_2 \lambda_1 \text{...d}_2\text{-many...}\right]\right]\right]\right]
\]

Thus, absence of narrow scope signals absence of a reduction analysis. The wide scope requirement for Japanese and Hindi-Urdu accordingly documents that these languages do not employ the reduction strategy in the formation of PCs.

3.2.5. Single remnant restriction

BT discuss another cross-linguistic generalization, illustrated by (76), which states that in Hindi-Urdu, the standard marker can be followed by a single constituent only. This ‘single remnant restriction’ is best compatible with the DA, because (76) would require a degree head that simultaneously combines with two remnants in the structural configuration \{more (than) [remnant, remnant,] \}. Such structure are, as BT observe, not compositionally interpretable:

(76) *Tina-ne aaj \text{[Pim kal-\text{se}]} \quad \text{zyaadaa kitaabe parh-i}
Tina_{ERG} today Pim yesterday-than] more books readPfv.FPI.

‘Tina read more books today than Pim yesterday.’

While it is correct that the single remnant restriction is a consequence of DA on the assumption that the comparative relation is encoded in the degree head itself, there is another, alternative analysis of multi-remnant PCs, though, that makes it possible to derive (76). Suppose that the asymmetric ordering induced by comparative semantics is relocated into the standard marker, as suggested in Alrenga et al. (2012), and that the grammar also makes available the five-place, two-remnant version \text{THAN}_{2R} defined in (77).

(77) \[
\text{THAN}_{2R} = \lambda_w \lambda_x \lambda_g \lambda_{d_2,d_3,<e,<e,t>} \lambda_y \lambda_z \sup(l_d \text{g}(d)(w)(x)) < \sup(l_d \text{g}(d)(y)(z))
\]

\text{THAN}_{2R} originates as the sister node of the lower remnant (remnant), moves to its surface position (\text{THAN}_{2R} \text{[remnant, \text{<THAN}_{2R} remnant,]} \text{J}) and reconstructs again at LF, much like ditransitive predicates in Larsonian shells (cf. Lin 2009). To simplify the further exposition, I assume that both remnants are individual denoting terms embedded in the target sentence (78). In the initial
steps of the derivation, which track the transition from the LF-input (78)a to (78)b, THAN$_{2R}$ is reconstructed, followed by covert movement of the two correlates him and the book, in that order, with the second movement (the book) tucking in below the first one (him). Next, the degree complement is moved to a position right below the second correlate the book, resulting in a stacked version of parasitic scope ((78)c).

(78) More people showed him the book than her the picture.
   a. More people [THAN$_{2R}$ her [$<$THAN$_{2R}$> the picture]] showed him the book
   b. [him$_1$ [the book$_2$ [$<$e,e,$\lambda_2$,$\lambda_1$,$\lambda_2$,$\lambda_1$,$\lambda_3$,$\lambda_1$,$\lambda_1$,$\lambda_1$,$TP$] [more people [her THAN$_{2R}$ the picture]])
      t$_1$ showed t$_2$]]]
   c. [him$_1$ [the book$_2$ [[her THAN$_{2R}$ the picture] [$<$d,$<e,e,t,$\lambda_3$,$\lambda_2$,$\lambda_1$,$\lambda_1$,$\lambda_1$,$\lambda_1$,$TP$] [d$_3$-many people]
            t$_1$ showed t$_2$]]]

Crucially, this derivation produces the desired three place relation which serves as the input for THAN$_{2R}$. Thus, some minor and rather innocuous changes in the analysis of comparatives render even structures with more than a single remnant interpretable by DA. In fact, an account along these lines has been proposed by Lin (2009) for reduced, apparently clausal comparatives with multiple remnants in Mandarin. But it also follows now that even though attractive, BT’s explanation for the single remnant restriction in Hindi-Urdu must be related to another property of the derivation. This is an interesting area open for future research.  

As already noted, Greek distinguishes between two standard markers: prepositional apo and the complementizer ap’oti. Merchant (2009) demonstrates that these two versions systematically differ in a number of ways. First, the single remnant condition holds for apo only:

(79) a. Perisoteri anthropi milisan me ton Gianni tin Kyriaki [Merchant 2009: (21)b]
    More people spoke with the Giannis the Sunday
    ap’oti me ton Anesti to Savato.
    than$_{clausal}$ with the Anestis the Saturday
   b. *Perisoteri anthropi milisan me ton Gianni tin Kyriaki [ibid., (22)b]
    More people spoke with the Giannis the Sunday
    apo me ton Anesti to Savato.
    than$_{phrasal}$ with the Anestis the Saturday
    ‘More people spoke with Giannis on Sunday than with Anestis on Saturday.’

Second, only ap’oti may combine with PPs. These two initial observations indicate that apo-PCs are base generated and are to be analyzed in terms of DA, whereas ap’oti-PCs have a clausal source.

---

18 For a possible explanation in terms of conditions on multiple overt wh-movement see Lechner (2014).
Third, the relation between the remnant and its (reconstructed) base position is subject to island conditions in *apo*-PCs but not in reduced constructions introduced by *ap'oti*:

For Merchant, the PC in (81)a manifests an instance of ‘island repair by ellipsis’, a mechanism operative, among others, in sluicing that is known to ameliorate certain locality violations by foregoing pronunciation of the island ((82)a; Merchant 2001):

Assuming that the ellipsis site in both constructions contains abstract syntactic representation, Merchant suggests that the remnants (*Bush* and *which* in (81)a and (82)a respectively) move to clause initial positions, followed by TP-deletion, as made visible in (83) for the Greek *ap’oti*-PC with English glosses. The latter step neutralizes island violations by removing all non-locally bound traces from the representation:

The movement analysis also generates the correct prediction that in languages that prohibit preposition stranding, like Greek, the remnant cannot be a bare prepositional complement:

(84) *Perisoteri anthropi menun stis IPA ap’oti Rosia, <menun sti(s) t1>. more people live in.the USA than_clausal, Russia live in legendary Russia live in

(‘More people live in the US than in Russia.’)
Returning to the ill-formed (81)b, the island sensitivity of apo-PCs falls, as Merchant notes, squarely within the bounds specified by the base generation account. The DA-derivation for (81)b, schematized in (85), requires the correlate to raise out of a phonologically overt relative clause island. But this renders (81)b ineligible for reasons of syntactic locality.

(85) Putin [[MORE\textsubscript{PC} than Bush] [\lambda_{2} \lambda_{1} [d_{2}-many people live in the state that *\textsubscript{t_{1}} governs]]]

(*More people live in the state that Putin governs than Bush.) (= (81)b)

Merchant’s analysis of PCs in Greek accordingly confirms the two hypotheses that (i) the choice between DA and RA is subject to cross-linguistic variation and that (ii) MORE\textsubscript{PC} implicates formation of a parasitic scope context which is created by covert syntactic movement.

Table (86) summarizes the typological results. Hindi-Urdu interprets the DP following than as the complement of three place MORE\textsubscript{PC}, while English reconstructs a clausal frame around the remnant of PCs. In Japanese, all PCs are derived by DA, but the language also uses two-place MORE (e.g. in reduced constructions with multiple remnants). Finally, Greek has two versions of PCs, reduced and base-generated, which are distinguished by the shape of the standard marker:

<table>
<thead>
<tr>
<th></th>
<th>Ellipsis in degree clause?</th>
<th>Principle C diagnostic</th>
<th>Scope of QP</th>
<th>Multiple remnants?</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>✓</td>
<td>RA</td>
<td>\forall \succ \texttt{MORE}</td>
<td>✓</td>
</tr>
<tr>
<td>Hindi-Urdu</td>
<td>*</td>
<td>DA</td>
<td>\texttt{MORE} \succ \forall</td>
<td>*</td>
</tr>
<tr>
<td>Japanese</td>
<td>✓</td>
<td>DA</td>
<td>\texttt{MORE} \succ \forall</td>
<td>✓</td>
</tr>
<tr>
<td>Greek</td>
<td>✓</td>
<td>[not tested]</td>
<td>[not tested]</td>
<td>✓ (\texttt{ap'oti} \ succ \texttt{apo})</td>
</tr>
</tbody>
</table>

3.2.6. Interim summary

To recapitulate, the present section has collected phenomena and diagnostics from research over the last four decades on the distinguishing characteristics of PCs and CCs. While the proper analysis of particular constructions (e.g. extraction in (40)b; Russell sentences; the location of the comparative relation) is still under debate, it is also possible to discern an emerging consensus in other domains, which can be summarized as follows. First, languages employ at least two different, possibly related (Kennedy 1999), semantic strategies to derive PCs: (i) syntactic reduction of degree clauses that serve as the restrictor argument of generalized degree quantifiers and (ii) base generation with the help of a three-place comparative operator. Second, the internal make-up of PCs is subject to typological variation, not all languages have at their disposal the same inventory of degree operators. PCs can be the result of reduction (English, German), base generation (Hindi-Urdu) or both (Japanese, Greek). Third, there are constructions which fit the signature of PCs but are uninformative with respect to the dispute between DA and RA because they consist of small clauses (see e.g. (35)).

The remainder of this chapter addresses recent trends in the study of PCs (4.1/4.2.) and closes with a puzzling restriction on the distribution and interpretation of PCs (4.3).
4. SELECTED RECENT TRENDS

This final section explores three topics which have gained some prominence in current research on PCs: homologies between the degree domain and mereologies, exemplified by partitives; cross-linguistic differences in the formal means used to express the comparison relation; and structural restrictions on the well-formedness and interpretation of PCs.

4.1. ‘than’ as a partitive

In course of the hitherto discussion, the standard marker than has been given three different interpretations: the syntactic manifestation of the maximization operator (von Stechow 1984; Rullmann 1995); a degree determiner encoding the comparative relation (Alrenga et al. 2012; Alrenga and Kennedy 2014); and, the classic view, as a semantically vacuous item (Heim 1985, 2000; Kennedy 1999; Schwarzschild and Wilkinson 2002). There is also a fourth position, advocated in Pancheva (2006), who suggests that than functions as a partitive preposition in the degree domain.

Partitive of is ambiguous between the two lexical entries (87), both of which express the mereological part-of relation. What Pancheva calls the ‘referential’ variant (87)a combines with individual terms, as in (88)a, while the predicative entry (87)b surfaces in pseudopartitives with weak NPs ((88)b):

(87) a. \[\text{of}_{1}\] = \(\lambda x \lambda y. y \text{ is part of } x\)
   b. \[\text{of}_{2}\] = \(\lambda P \langle e, t \rangle. \lambda y. y \text{ is part of } P\)

(88) a. some \text{of}_{\langle e, <e,t> \rangle} [\text{the water}]_e
   b. a glass \text{of}_{\langle <e,t>, <e,t> \rangle} \text{water}_{<e,t>}

Based on a typological study of Slavic, Pancheva (2006) argues that parallel manifestations of partitivity can also be found in the degree domain, where they underlie the lexical specification of a ‘referential’ and a degree predicate variant of the standard marker than:

(89) a. [\text{THAN} _1] = \lambda d \lambda d'. d' \text{ is part of } d
   b. [\text{THAN} _2] = \lambda D_{\langle e, t \rangle} \lambda d. d \text{ is part of } D

The ambiguity hypothesis receives prima facie support from Polish and Serbo-Croatian, which, similar to Greek, morphologically distinguishes \text{THAN} _1 (niz and nego, respectively) from \text{THAN} _2 (od). Moreover, again in analogy to Greek, only one variant (od) imposes categorial selectional restrictions on the remnant and assigns a designated case (genitive).

In most contexts, the two versions of \text{THAN} are in complementary distribution. To begin with, \text{THAN} _1 introduces maximized, possibly reduced, degree clauses, and turns them into predicates of intervals which then serve as the restrictor argument of the degree quantifier MORE. On this view, reflected by the LF-representation (90)b, the degree complement is a derived predicate that is nominalized by the maximality operator (8) but subsequently mapped to a

\(^{19}\)4.1 and 4.2 are partially drawn from Lechner and Corver (to appear).
predicate meaning again.

(90)  
  a. Ann is taller than Ben (is).
  b. Ann is tall [MORE [\[<d,t> \THAN_1 [\[\lambda_1 \text{Ben d}_1 \text{tall}]]]]].

In Slavic, degree abstraction at the CP-level can be made visible by an overt \textit{wh}-phrase which optionally surfaces in a position right-adjacent to \textit{THAN}_1.

Pancheva provides empirical support for the particular architecture (90)b from Bulgarian and Polish, noting that the degree clause behaves like a definite free relative, which in turn is indicative of the presence of the maximization operator. Another, potentially even stronger, reason for postulating maximization might be that it re-instantiates the account of negative islands envisioned in von Stechow (1984) and Rullmann (1995). According to this view, the ill-formedness of (91)a is reduced to the fact that the negated argument of the operator in (91)b lacks a maximum, and therefore ends up undefined:

(91)  
  a. *Ann is taller than Ben is not
  b. MAX(\lambda d.\text{not(Ben is d-tall)})

On the degree quantifier analysis, this explanation is lost, because \textit{MORE} directly combines with the derived degree predicate, without the mediation of maximization. Thus, by introducing an intermediate step of maximality, Pancheva’s proposal has the positive side-effect of combining the benefits of the maximization analysis with that of the quantificational account.

It was already noted in passing in section 2.2 that MPs are ambiguous between a \textit{d}-type/interval and a predicate of intervals interpretation (Schwarzschild 2005 and references therein). \textit{THAN}_1 can therefore directly combine with MPs in their \textit{d}-type incarnation. Evidence for the presence of the referential version \textit{THAN}_1 comes, among others, from the observation that in languages like Bulgarian, it shares a single morphological exponent (\textit{ot}) with the partitive individual domain preposition \textit{ofj}.

In contrast to \textit{THAN}_1, the predicative variant \textit{THAN}_2 is used with predicative MPs ((92)) and small clause PCs ((93)). That treating certain PCs as unreduced small clauses offers an explanation for various objections to RA was already seen in section 3.1.2. Compositional interpretation of PCs with individual remnants ((93)a) is ensured by degree abstraction inside the small clause, as seen in (93)b. MP comparatives do not require further adjustment, since MPs can be interpreted as predicates of intervals:

(92)  
Ann is taller than [6 feet]_<d,t>.

(93)  
  a. Ann is taller than Ben.
  b. Ann is taller \textit{THAN}_2 [\textit{small clause,} <d,t> \lambda_1 [\text{Ben d}_1 \text{tall}]].

Finally, Pancheva presents qualitatively new evidence against an ellipsis analysis of comparatives with MP remnants in Slavic. Unlike clausal degree complements, which can lexicalize the higher occurrence of the movement chain (\textit{čem}/‘what’ in Russian), MP-comparatives are incompatible
with overt \( wh \)-operators:

(94)  
\begin{align*}
a. & \text{ Ivan rostom bol’še ["d,vux metron].} & \text{[Russian; Pancheva 2006: (12)]} \\
& \text{Ivan in-height more two meters\textsubscript{GEN}} \\
& \text{‘Ivan is taller than 2m.’} \\
b. & \text{*Ivan rostom bol’še čem dva metra.} \\
& \text{Ivan in-height more what two meters}
\end{align*}

The contrast in (94) signals that MP-comparatives are not derived by reduction, but are combinations of d-type MPs with \textsc{than} \(_1\) or predicate MPs with \textsc{than} \(_2\).

To summarize, a new perspective on the semantic contribution of \textit{than} offers novel insights into the typology of comparatives in Slavic, endorsing the hypothesis that cross- 

Employing the mereological part-of relation in the interpretation of degrees also has, Pancheva notes, an important theoretical consequence: it imposes on the analysis an interval semantics for degrees (Schwarzschild and Wilkinson 2002). If to be \textit{6 feet tall} means to be ‘part of’ \textit{6 feet}, the measure phrase cannot denote a point on a scale, but must be mapped to a segment.

4.2. PCs vs. CCs in Japanese

As was exposed in section 2.1, there are two, logically distinguishable yet empirically very close ontological perspectives on degrees: degrees can be conceived of as atomic parts of the denotation domain, or as entities emerging from equivalence classes (Cresswell 1976). It is a corollary of this distinction that comparison can be expressed by comparing \textit{degrees} or \textit{individuals} (Kennedy 2009) Two questions which have recently attracted attention in the literature are to which extent these positions are reflected in natural language, and whether all languages select the same option. Evidence for such a typological split comes from Japanese, among others, and here in particular Japanese PCs.

Beck et al. (2004, 2009) discuss three properties that distinguish English from languages like Japanese and Chinese: (i) Japanese lacks subdeletion constructions ((95)); (ii) in Japanese, attributive comparatives are restricted to amount constructions with \textit{many} ((96); Ishii 1991); and (iii) Japanese comparatives are not sensitive to negative islands ((97)):

(95)  
\begin{align*}
a. & \text{*Kono tana-wa [ano doa-ga hiroi yori (mo)].} & \text{[Beck et. al 2004: (5)]} \\
& \text{this shelf\textsubscript{TOP} that door\textsubscript{NOM} wide YORI (mo)} \\
b. & \text{This shelf is taller than that door is wide.}
\end{align*}

(96)  
\begin{align*}
a. & \text{Taroo-wa [Hanako katta yori] takusan kasa-o katta.} & \text{[ibid., (3a)]} \\
& \text{Taroo\textsubscript{TOP} Hanako bought YORI many umbrella\textsubscript{ACC} bought}\text{‘Taroo bought more umbrellas than Hanako.’} \\
b. & \text{?*Taroo-wa [Hanako katta yori] nagai kasa-o katta.} & \text{[ibid., (4a)]} \\
& \text{Taroo\textsubscript{TOP} Hanako bought YORI long umbrella\textsubscript{ACC} bought}\text{‘Taroo bought a longer umbrella than Hanako did.’}
\end{align*}
a. John-wa [dare-mo kawa-naka-tta no yori] takai hon-o katta. [ibid., (6)]
   John TOP anyone buy-Neg-Past no YORI expensive book ACC bought
b. *John bought a more expensive book than nobody did.

Beck et al. (2004) reduce these differences to parametric variation in the availability of syntactic degree variable binding. Binding of degree variables in the syntactic component is essential for the formation of subcomparatives, which are by nature clausal and therefore need to involve degree abstraction. Moreover, the degree binding relation is sensitive to negative island. The absence of these phenomena, among others, lead Beck et al. (2004) to conclude that Japanese lacks object language degree variables.

In order to derive the asymmetric ordering relation of comparatives without degree abstraction, Beck et al. adopt two independent assumptions: (i) Japanese degree clauses function as a free relatives and (ii) the comparative relation is not derived compositionally from the semantics of the degree head (EXPLICIT COMPARISON), but arises from the use of a pragmatic strategy (IMPLICIT COMPARISON). Specifically, (96)a is analyzed roughly parallel to the implicit comparative Compared to what Hanako bought, Taroo bought more umbrellas. The ill-formedness of (96)b can then be reduced to the same factors which are responsible for the deviance of ?Compared to what Hanako bought, Taroo bought a long umbrella.

However, Kennedy (2009) presents a strong empirical argument against the position that Japanese lacks degree abstraction altogether. The ill-formed clausal comparative (96)b contrasts with its synonymous phrasal, yet fully acceptable variant (98)a:

(98) a. Taroo-wa [Hanako yori] nagai kasa-o katta. [Kennedy 2009: (37)]
   Taroo TOP Hanako YORI long umbrella ACC bought
   ‘Taroo bought a longer umbrella than Hanako.’

b. [(Taroo-wa1 [[Hanako yori]2 [<d,<e,t> λ2 λ1 t1 bought a t2,d-long,<e,t> umbrella]]])

c. [(98)b] = [MOREPC] [[Hanako]] ([λ2 λ1 t1 bought a d2-long umbrella]) ([Taroo]) =
   = MAX(λd.Hanako bought a d-long umbrella) <
   MAX(λd.Taroo bought a d-long umbrella)

Japanese PCs are base-generated. Thus, the correlate and the yori-phrase need to move, in that order, establishing a relation of parasitic scope, as in (98)b (cf. (45)). But movement of the yori-phrase in (98)b evidently results in degree abstraction, contradicting the strong claim that Japanese indiscriminately lacks bound degree variables. Kennedy accordingly argues for a weaker version of the degree parameter (99), which more narrowly localizes the area of cross-linguistic variation in the first argument position of the degree head MORE:

(99) a. Non-phrasal comparative complements (“complex standards”) in Japanese are always of type e. Degree complements of phrasal comparatives can be of type d.
b. Non-phrasal comparative complements in English are potentially of type d.

According to (99), some languages, among them Japanese, exclusively have access to the three place degree head MOREPC (see (41)). As a consequence, the standard argument is always supplied
by an individual term, resulting in INDIVIDUAL COMPARISON. By contrast, languages that fall in the same group as English employ the two-place degree quantifier MORE and therefore admit degree expressions as standards (DEGREE COMPARISON). On this conception, the typological contrast between English and Japanese is not related to ‘deep’ semantic parameters such as the absence vs. presence of degree variable binding, but reflects probably idiosyncratic differences in the lexicon. This result also aligns well with the findings of Bhatt and Takahashi (2011), according to whom variation emerges as the result of independent syntactic constraints operating on an unrestricted functional lexicon.

4.3. Data section: two additional conditions on PCs

Closing the discussion with a puzzle for future research, the final section of this chapter collects, without any attempt at an analysis, some intriguing further observations about structural conditions on the distribution and interpretation of PCs.

There is a curious restriction on attributive PCs, which blocks combinations that fail to abide by generalization (100) and manifests itself slightly differently across languages:

(100) **Attributive comparative generalization**

In attributive degree comparatives, the correlate must c-command the comparative NP.

Empirically, the effects of generalization (100) can for instance be seen in German, which prohibits subject PCs from co-occurring with direct object remnants ((101)), and indirect object PCs with direct object remnants ((102); Lechner 1997). The control in (102)c shows that IO-comparatives are compatible with subject correlates, attesting to the fact that dative comparatives are not inherently blocked:

(101) **SUB\_COMP\_I - DO\_correlate**

a. Die Maria kennt bessere Komponisten als der Peter.
   ‘Mary knows better composers than Peter knows.’

b. *Bessere Komponisten kennen die Maria als den Peter.
   ‘Better composers know Mary than know Peter.’

(102) **IO\_COMP\_I - DO\_correlate**

a. Maria hat dem Peter bessere Komponisten als dem Fritz vorgestellt.
   ‘Mary introduced better composers to Peter than to Fritz.’

b. *Maria hat besseren Komponisten den Peter als den Fritz vorgestellt.
   ‘Mary introduced Peter to better composers than Fritz.’

\footnote{But see Shimoyama (2012), who brings to attention a wide array of empirical objections against the claim that Japanese PCs do not implicate degree comparison.}
Mary has him\textsubscript{ACC} better composers\textsubscript{DAT} introduced than I\textsubscript{NOM}
‘Mary introduced him to better composers than I.’

(103) documents that passive and unaccusative subjects are exempted from generalization (100):

(103) ✓\textsubscript{SUB}\textsubscript{[COMP]}, passive/unaccusative - \textit{DO}_\textsubscript{correlate}

a. Ein besserer Vertrag\textsubscript{COMP} als der Maria wurde nur dem Peter\textsubscript{correlate} angeboten.
   a better contract\textsubscript{NOM} than the Mary\textsubscript{DAT} was only the Peter\textsubscript{DAT} offered
   ‘Only Mary was offered a better contract than Peter.’

b. Ein schlimmerer Fehler\textsubscript{COMP} als mir ist dem Peter\textsubscript{correlate} unterlaufen.
   a worse mistake\textsubscript{NOM} than me\textsubscript{DAT} is the Peter\textsubscript{DAT} occurred
   ‘A more serious mistake occurred to me than to Peter.’

To add another intriguing property, the prohibition on subject PCs is also abrogated with numerical amount comparatives:

(104) ✓\textsubscript{SUB}_{[COMP]}, amount - \textit{DO}_\textsubscript{correlate}

a. Leider mögen mehr Leute\textsubscript{COMP} Mozart\textsubscript{correlate} als Biber.
   Unfortunately, like more people\textsubscript{NOM} Mozart\textsubscript{ACC} than Biber\textsubscript{ACC}
   ‘Unfortunately, more people like Mozart than Biber.’

b. Maria hat mehr Komponisten\textsubscript{COMP} den Peter\textsubscript{correlate} als den Fritz\textsubscript{correlate} vorgestellt.
   Mary has more composers\textsubscript{DAT} the Peter\textsubscript{ACC} than the Fritz\textsubscript{ACC} introduced
   ‘Mary introduced Peter to more composers than Fritz.’

Pancheva (2009) independently reports that reflexes of generalization (100) can also be detected in Slavic, Greek, Hungarian and probably English, as opposed to Turkish, Hindi, Japanese and Korean, which admit subject PCs (“in the Slavic languages, a more-NP cannot be an underlying subject […] in phrasal comparatives”). The Polish paradigm (105) further illustrates that the subject restriction is perceptible in base-generated PCs introduced by \textit{THAN}_2 (\textit{od}) but ignores reduced PCs introduced by \textit{THAN}_1 (\textit{niż}):

(105) *\textsubscript{SUB}_{[COMP]} - \textit{DO}_\textsubscript{correlate} (Polish)

a. ??/!*Vięcej uczniów zwiedziło Czechy \textit{od} Słowacji. [Pancheva 2009: (6)]
   more students visited Czech R. \textit{THAN}_1 Slovakia\textsubscript{GEN}

b. Więcej uczniów zwiedziło Czechy \textit{niż} Słowacji.
   more students visited Czech R. \textit{THAN}_2 Slovakia\textsubscript{ACC}
   ‘More students visited the Czech Republic than Slovakia.

c. Marek zwiedził więcej miejsc \textit{od} Anny. [ibid., (7c)]
   Marek visited more places \textit{THAN}_1 Anna\textsubscript{GEN}
   ‘Marek visited more places than Anna.’
Pancheva develops a syntactic analysis of Generalization (100) in terms of the Subject Condition. An alternative approach, which links the subject restriction to general conditions on parasitic scope, is explored in Lechner (2014).

Interestingly, generalization (100) resembles another perplexing property of PCs, which pertains to the temporal interpretation of the missing predicate inside the degree argument. It has been noted in the literature that PCs are temporally underspecified (Pinkham 1982: 130; McCawley 1988 [1998: 716]). For instance, ? can be felicitously used to characterize situations in which Sam will visit more friends than Sam will visit, or more friends than Sam has visited, or more friends than Sam is in the process of visiting. McCawley refers to such readings as atemporal prototypes.

\[ \text{(106) } \checkmark \text{Atemporal reading: OBJ}_{\text{[COMP]}} \rightarrow \text{SUB}_{\text{correlate}} \]
\[
\begin{align*}
\text{John}_{\text{correlate}} & \text{ will visit more friends}_{\text{[COMP]}} \text{ than Sam.} \\
a. & \ldots \text{than Sam will visit d-many friends} \\
b. & \ldots \text{than Sam visited d-many friends}
\end{align*}
\]

What seems to have gone unnoticed is that atemporal interpretations are also subject to structural conditions. More precisely, the correlate must reside in a position above the comparatively marked constituent, as expressed by generalization (107) (Lechner 2004).

\[ \text{(107) Atemporal PC generalization} \]
\[
\text{Atemporal readings of PCs are restricted to contexts in which the correlate c-commands the comparative NP.}
\]

(107) captures the observation that combinations of subject comparatives with object correlates lack atemporal readings ((108)). Similarly, the contrast between (109) and (110) shows that in double object constructions, accusative correlates and PP comparatives admit atemporal interpretations which are absent if the structural relations are reversed ((110)):

\[ \text{(108) } \checkmark \text{Atemporal reading: SUB}_{\text{[COMP]}} \rightarrow \text{DO}_{\text{correlate}} \]
\[
\begin{align*}
\text{More friends}_{\text{[COMP]}} & \text{ will visit John}_{\text{correlate}} \text{ than Sam.} \\
a. & \ldots \text{than d-many friends will visit Sam} \\
b. & \ldots \text{than d-many friends visited Sam}
\end{align*}
\]

\[ \text{(109) } \checkmark \text{Atemporal reading, double object constructions: DP}_{\text{correlate}} \rightarrow \text{PP}_{\text{[COMP]}} \]
\[
\begin{align*}
\text{John will subject this year’s students}_{\text{correlate}} \text{ to a harder exam}_{\text{[COMP]}} \text{ than last year’s students.} \\
a. & \ldots \text{than John will subject last years students to a d-hard exam} \\
b. & \ldots \text{than John subjected last years students to a d-hard exam}
\end{align*}
\]
(110) *Atemporal reading, double object constructions: $DP_{\text{[COMP]}} \sim PP_{\text{correlate}}$

John will subject more students$_{\text{[COMP]}}$ to this year’s exam$_{\text{correlate}}$ than to last year’s exam.$^{21}$

a. ... than John will subject d-many students to last year’s exam.

b. *... than John subjected d-many students to last year’s exam.

(107) strikingly looks like generalization (100), which regulates the distribution of attributive PCs in languages like German and Slavic. In both cases, the grammar makes reference to the condition that the correlate c-command the comparative NP. It would certainly be surprising if this uncanny similarity turned out to be merely accidental.

REFERENCES


$^{21}$Choice of an amount comparative avoids potential interference from generalization (100).


According to Beck et


Wold, Dag. 1995. Antecedent-Contained Deletion in Comparative Constructions. Ms, MIT.

