

## Phrasal and Clausal Comparatives in Slavic

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### 1. Background

Comparatives can be descriptively divided into two types – *clausal* and *phrasal* – depending on the category of the phrase following *than*.

- (1) a. Mary is taller than John is. (clausal)  
b. Mary is taller than John. (phrasal)

By now, there is a consensus on the structure of clausal comparatives. They are thought to involve a CP-complement to the preposition *than*, with a *wh*-operator in Spec, CP binding a degree variable in the gradable predicate (cf. Heim 2000 a.o.), as in (2a). The gradable predicate is obligatorily elided under identity with the matrix predicate – a phenomenon known as *Comparative Deletion* (Bresnan 1973) – indicated by shading in (2b).<sup>1</sup> In English, the *wh*-operator itself is non-overt, resulting in the PF in (2b).

- (2) a. LF: Mary is taller [<sub>PP</sub> than [<sub>CP</sub> wh<sub>1</sub> John is d<sub>1</sub>-tall ]]  
b. PF: Mary is taller [<sub>PP</sub> than [<sub>CP</sub> Ø John is ~~d<sub>1</sub>-tall~~ ]]

There is no similar consensus as far as phrasal comparatives are concerned. Historically, there have been two approaches. The *reduced clause analysis* (e.g., Heim 1985, Hackl 2000, Lechner 2001) holds that phrasal comparatives always have a full clausal structure, which is masked by ellipsis. On this view, (1b) has the LF in (2a), but at PF more

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<sup>1</sup> Alternatively, the gradable predicate is *wh*-moved (Chomsky 1977, Kennedy 1999).

material is elided, as in (3), creating the illusion that the complement of *than* is a DP. This analysis is supported by the fact that ellipsis beyond Comparative Deletion is independently attested (cf. (4)).

(3) PF: Mary is taller [PP than [CP Ø John is ~~d<sub>1</sub>-tall~~ ]]

(4) a. John grew taller than I thought he would [<sub>VP</sub> grow [<sub>AP</sub> d tall ]]  
 b. John grew taller than I thought [<sub>TP</sub> he would [<sub>VP</sub> grow [<sub>AP</sub> d tall ]]]

The *direct analysis* (e.g., Hankamer 1973, Napoli 1983, a.o.) holds that at least some phrasal comparatives do not involve ellipsis at all; rather *than* has a DP complement, as in (5).

(5) LF and PF: Mary is taller [PP than [DP John]]

A major problem with the direct analysis is that it requires a different *-er* than the one used in clausal comparatives (as in Kennedy 1999). In clausal comparatives, the meaning of *-er* is defined in terms of having a definite description of a degree or a predicate of degrees as an argument (the denotation of *wh<sub>1</sub> John is d<sub>1</sub>-tall*). Neither of these meanings works if *than* combines directly with an individual (*John*).

Moreover, some phrasal comparatives clearly have a clausal source. Case-matching between the post-*than* DP and a correlate in the matrix varies with the interpretation of the sentence (see (6), from Heim 1985), suggesting that the DP is not a complement of *than* but an argument in a clause, reduced by ellipsis, which matches the matrix clause in structure.

(6) Ich habe dir bessere Schlagzeuger [...] vorgestellt.  
 I-NOM have you-DAT better drummers introduced  
 'I have introduced better drummers to you ...'  
 a. als der Karlheinz b. als dem Karlheinz  
 than the-NOM Karlheinz than the-DAT Karlheinz  
 '... than Karlheinz has.' '... than to Karlheinz.'

The conclusion is that at least some phrasal comparatives must be given a reduced clause analysis. The simplest account would extend that analysis to all phrasal comparatives. This would reduce the syntax and

semantics of phrasal comparatives to that of clausal ones, achieving uniformity for all comparatives.

Nevertheless, it remains the case that for at least some phrasal comparatives the reduced clause analysis is problematic. Case-dependency on *than*, and extraction of the complement of *than* (see (7)) are among the most commonly given arguments in support of the direct analysis (Hankamer 1973, Napoli 1983). The facts in (7) are expected under the syntax in (5) but not under that of (2a).

- (7) a. Mary is taller than him/\*he  
b. Who is John taller than?

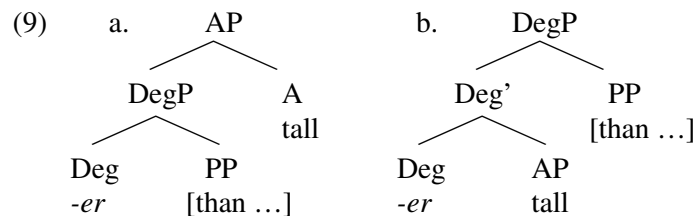
Anaphors, NPIs, and negative concord words can also appear as the post-*than* DP licensed by an element in the matrix (Hoeksema 1983, a.o.), suggesting that they are not in an embedded clause reduced by ellipsis. And although Heim (1985) cautions that not all of these arguments straightforwardly argue for the direct analysis, it is clear that they present a challenge for the reduced clause analysis. The challenge is not necessarily insurmountable, but until it is shown in concrete terms how the reduced clause analysis handles the problematic facts, we cannot conclude that it is the right analysis for all phrasal comparatives.

To summarize, while semantic arguments and uniformity considerations support the reduced clause analysis for all phrasal comparatives, there are syntactic arguments that challenge that account for at least some phrasal comparatives. The direct account, on the other hand, requires positing two different *-ers*. The fact that they are pronounced the same in English, in Russian (*-ee*), in Bulgarian (*po-*) and in other languages, would not be captured. The question of what is the right analysis for phrasal comparatives thus remains open.

Here, I argue for a modification of the reduced clause analysis on the basis of data from Slavic. In particular, I suggest that some phrasal comparatives are derived not from full *wh*-clauses as in (2a), but from small clauses as in (8a). For other phrasal comparatives, the direct analysis is defended, as in (8b). This non-uniform account of phrasal comparatives is shown to have empirical and conceptual advantages.

- (8) a. PF and LF: Mary is taller than [<sub>SC</sub> John d-tall]  
b. PF and LF: Mary is taller than [<sub>DegP</sub> 5ft]

Before I present my analysis, let me clarify what my assumptions are about the general architecture of comparatives. There have been two major approaches to the syntax-semantics of comparatives. The classical analysis (Bresnan 1973, Heim 2000, a.o.) (cf. (9a)) holds that the *than*-clause is the argument of a degree quantifier *-er*; that the DegP [*-er* [*than*-clause]] is the argument of the gradable predicate; and that the *than*-clause is discontinuous from *-er* because it is obligatorily extraposed. In contrast, the Deg-headed analysis (Abney 1987, Larson 1988, Kennedy 1999, a.o.) (cf. (9b)) holds that *-er* and the gradable predicate form a constituent to the exclusion of the *than*-clause.



I will assume here the classical analysis, as in (9a), without justification; arguments in favor of it can be found elsewhere (e.g., Heim 2000, Bhatt and Pancheva 2004). I will further assume that the *than*-PP is merged with *-er* late, after *-er* undergoes QR (as in Bhatt and Pancheva 2004).

## 2. Two More Arguments against the Reduced (Full) Clause Analysis

The Russian counterpart of the *than*-PP is a *wh*-expression (cf. (10a)), or is in the genitive case (cf. (10b)), (examples from Matushansky 2001).

- (10) Germann byl sil'nee...  
 Germann<sub>NOM</sub> was stronger  
 'Germann was stronger...'
- |   |  |
|---|--|
| <p>a. čem (byl) ego protivnik.<br/> <i>what</i><sub>INSTR</sub> was his adversary<sub>NOM</sub><br/>     '...than his adversary (was).'</p> | <p>b. svoego protivnika<br/>     [own adversary]<sub>GEN</sub><br/>     '...than his adversary.'</p> |
|---|--|

Example (10a) clearly involves a reduced clause, as the presence of the *wh*-element, and the possibility of having an overt tensed verb (*byl*)

indicates (cf. also Bailyn (in press)). But a reduced clause analysis for (10b) is unlikely. This is not so just because of the absence of a preposition and the presence of a genitive case-marking on the DP. This pattern is familiar from other languages and, by itself, does not introduce any more complications for the reduced clause analysis than the English (7a). The relevance of this example is in the fact that it is restricted to synthetic comparatives (Matushansky 2001). Only the *wh*-variant in (10a) may appear with the analytic *bolee sil'en* lit. 'more strong', the genitive variant in (10b) being unacceptable. There is no way to state the conditions on ellipsis to account for this restriction without a stipulation.

To see this, let's suppose that both (10a) and (10b) are derived from the underlying clause in (11).<sup>2</sup> (10a) would involve movement of the subject out of the IP, and deleting either the whole IP (as shown in (11a)) or just the part below the tensed verb.<sup>3</sup> (10b) would require moving the subject out of the CP, and deleting the whole CP.<sup>4</sup> The underlying assumption, of course, is that ellipsis targets constituents.

- (11) [<sub>CP</sub> wh<sub>1</sub> his adversary was d<sub>1</sub>-strong]
- a. [<sub>CP</sub> wh<sub>1</sub> [<sub>IP</sub> [<sub>IP</sub> t<sub>2</sub> was d<sub>1</sub>-strong] [<sub>DP</sub> his adversary]<sub>2</sub>]]
- b. [<sub>CP</sub> [<sub>DP</sub> his adversary]<sub>2</sub> [<sub>CP</sub> wh<sub>1</sub> [<sub>IP</sub> t<sub>2</sub> was d<sub>1</sub>-strong]]]

Since the structure of the two types of comparatives is the same under this analysis, one would have to posit two different *-ers* (*-ees* in Russian), at least as far as their PF properties are concerned.<sup>5</sup> So far this is not particularly problematic, as it is normally assumed that heads license

<sup>2</sup> The comparatives may also involve a null *than* taking (11) as a complement.

<sup>3</sup> There may be other ways to derive the facts of (10a). For example, if *byl* 'was' stays in V, the subject-final word order could be due to VP-topicalization, as in (i). Then either VP-deletion would apply to the fronted VP, or just Comparative Deletion would, the result being an overt *byl*. See Szczegielniak (2004) for discussion of VP-topicalization as input to one kind of ellipsis in Russian. Such an alternative analysis for (10a) would not affect the argument made here.

(i) [<sub>CP</sub> wh<sub>1</sub> [<sub>IP</sub> [<sub>VP</sub> was d<sub>1</sub>-strong]<sub>2</sub> [<sub>IP</sub> his adversary t<sub>2</sub>]]]

<sup>4</sup> Scrambling the subject beyond a fronted *wh*-word is independently attested in Russian.

(i) Ivan kogo videl?  
Ivan whom saw  
'Who did Ivan see?'

<sup>5</sup> The syntactic configuration itself behind the synthetic and analytic form is assumed to be the same, as is also done in Matushansky (2001), Embick (2005).

ellipsis, e.g., Merchant (2001:60) posits that the presence of a special feature *E* on a given head licenses the ellipsis of the complement to that head. The problem emerges when we consider how to implement that technically. Having *E* on *-ee* would result in a synthetic comparative, i.e., the morphological merger of *-ee* with the adjective, and also CP ellipsis would be forced. The *-ee* without *E* could either be morphologically affixed on the adjective or merged with the semantically empty *bol-*, the counterpart of English *many/much* that merges with *-er* to form *more* (cf. Bresnan 1973). The problem with such an analysis is that things could easily have been different. The presence of *E* on *-ee* could have forced the use of *bol-*. Its absence could have required either one or the other of the synthetic and analytic form, but not allowed both. In other words, such an account of the link between the analytic/synthetic alternation and ellipsis is not explanatory. The same facts obtain in Hungarian (Wunderlich 2001), so an idiosyncrasy may not be invoked for Russian.

Another set of facts is similarly inconsistent with the reduced clause analysis. In measure phrase comparatives in Russian, only the genitive option is attested, the *wh*-operator being unacceptable.

- (12) ‘Ivan measures in height more than 2m.’
- a. ⊗<sup>6</sup> Ivan rostom bol’še, čem dva metra  
       Ivan in-height more what two meters
- b. Ivan rostom bol’še dvux metrov  
       Ivan in-height more [two meters]<sub>-GEN</sub>

The same facts obtain in Bulgarian and Polish. To maintain the reduced clause analysis one would have to argue that the *wh*-operator must obligatorily be deleted here (together with any verb and tense). There is no plausible reason why this should be so. The issue did not arise in English because the *wh*-operator is null to begin with, so its absence from measure phrase comparatives could not be immediately detected.

The above two sets of facts – the link between the analytic/synthetic distinction and the type of complement to *-er*, and the unacceptability of *wh*-operators in measure phrase comparatives – are novel arguments against the reduced clause analysis, as far as I know. I will take them seriously and will argue that we should explore an alternative.

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<sup>6</sup> Probably grammatical – the grammar doesn’t exclude it – yet strongly unacceptable.

### 3. The Proposal

My proposal starts with the thesis in (13). I do not defend this thesis here (see Pancheva 2005); I use it to justify two structures for comparatives.

(13) *Than* is a partitive preposition in the domain of degrees, corresponding to *of* in the domain of individuals.

A consequence of (13) is that like *of*, *than* can appear in two partitive structures. Consider the *of*-partitives in (14). (14a) is what I will call a *referential partitive*, as the complement of *of* is a referring expression (*the water*, of type  $\langle e \rangle$ ). I will call (14b) a *predicative partitive* (it is also known as a pseudo-partitive in the literature), since the complement of *of* here is a predicative expression (*water*, of type  $\langle e, t \rangle$ )<sup>7</sup>.

- (14) a. some *of* [<sub>DP</sub> the water]  
b. a glass *of* [<sub>NP</sub> water]

Under the thesis in (13), we expect to find two structures under *than* as well, a referential partitive (of type  $\langle d \rangle$ ) and a predicative partitive (of type  $\langle d, t \rangle$ ). Clausal comparatives would fall under the first structure. The *wh*-clause has been recognized as a free relative of degrees (Izvorski 1995, Donati 1997, Heim 2000) and free relatives are interpreted as definite descriptions (Partee 1987, Jacobson 1995, Rullmann 1995). So, the complement of *than* in clausal comparatives is a definite description of degrees, of type  $\langle d \rangle$ . In other words, (15) exactly parallels (14a).

(15) *than* [<sub>CP</sub> wh<sub>1</sub> John is d<sub>1</sub>-tall ] → LF: *than* [<sub>CP</sub> t<sub>d1</sub> John is d<sub>1</sub>-tall ]

Phrasal comparatives that clearly have a clausal source, i.e., reduced clausal comparatives (e.g., the German (6)) also are of this type, a case of referential partitives. However, phrasal comparatives like the Russian (10b) and (12b), are proposed to fall under the second – predicative partitive – strategy. Specifically, the *than*-PP in these comparatives has the structure in (16a), with *than* taking a small clause complement with

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<sup>7</sup> The container phrase in (14b) can also take a referential partitive, *a glass of the water*, but the quantifier in (14a) cannot appear with a predicative partitive: *\*some of water*.

an anaphoric predicate. Recall that I assume here that the *than*-PP is merged to *-er* not in-situ but at *-er*'s scope position, following Bhatt and Pancheva (2005). In other words, *-er* alone undergoes QR, leaving a degree variable behind in the matrix predicate, as in (16b). At LF, that predicate (*d<sub>1</sub>-tall*) is copied from the main clause into the small clause complement of *than*, as in (16b). Since the *than*-PP is not merged to the in-situ *-er*, no antecedent containment obtains.

- (16) a. *than* [<sub>SC</sub> John Δ]  
 b. LF: [<sub>IP</sub> [<sub>IP</sub> Mary is *d<sub>1</sub>-tall*] [<sub>DegP</sub> *-er*<sub>1</sub> [<sub>PP</sub> *than* [<sub>SC</sub> John *d-tall*]]]]]

The small clause predicate in the *than*-PP now contains a degree variable, therefore it is interpreted as a predicate of degrees, of type  $\langle d, t \rangle$ . In other words, the *than*-PP in (16b) is parallel to (14b).

Recall the facts of case-licensing by *than*, extraction of the post-*than* phrase (cf. (7)), the licensing of anaphors, NPIs, etc. – the facts that were problematic for the reduced clause analysis. Under the proposal here these facts follow, with *than* acting like an ECM-preposition (see (17)).

- (17) a. With [<sub>SC</sub> him absent] ...  
 b. Who<sub>1</sub> do you consider [<sub>SC</sub> t<sub>1</sub> smart]?

Measure phrase comparatives do not involve *wh*-operators and ellipsis, nor copying from the main clause – they are interpreted directly. (18) is the structure of measure phrase comparatives at PF and LF. Since measure phrases are ambiguous between a definite degree (of type  $\langle d \rangle$ ), and a predicate (of type  $\langle d, t \rangle$ ) (Schwarzschild 2002, 2004), (18) can involve either the referential or the predicative partitive strategy.

- (18) Mary is taller than [<sub>DegP</sub> 5ft] / more than [<sub>DegP</sub> 5ft] tall.

In sum, the analysis of comparatives advocated here is not uniform – there are three distinct syntactic complements of *than* – a *wh*-clause, a small clause, a measure DegP – supporting two distinct interpretations – a definite description or a predicate of degrees. This non-uniformity is of the same type as that of partitives. The grammar allows for a partitive preposition to have either a referring or a predicative phrase as a complement. The same principle accounts for comparative *than*. So, a



different kind of unification is achieved – between partitives of degrees and partitives of individuals.

Both referential and predicative comparative structures are found in Slavic comparatives. Russian *čem-* and genitive- comparatives involve the referential and the predicative partitive strategy, respectively. The counterpart of *than* is a null preposition.

- (19) ‘Anna is taller than Ivan.’
- a. Anna vyše čem Ivan. (referential)  
Anna taller wh-<sub>INSTR</sub> Ivan
  - b. Anna vyše Ivana. (predicative)  
Anna taller Ivan-<sub>GEN</sub>

Polish *niż-* and *jak-* comparatives involve the referential strategy, and *od-* comparatives the predicative strategy. *Niż* is a preposition, the counterpart of *than*.<sup>8</sup> *Od* is too. To the extent that *jak-* comparatives are acceptable, they are exactly parallel to Russian *čem* comparatives and involve a null preposition taking a *wh*-clause complement.

- (20) ‘Anna is taller than Agnieszka.’
- a. Anna jest wyższa niż Agnieszka. (referential)  
Anna is taller than Agnieszka-<sub>NOM</sub>
  - b. % Anna jest wyższa jak Agnieszka.<sup>9</sup> (referential)  
Anna is taller wh- Agnieszka-<sub>NOM</sub>
  - c. Anna jest wyższa od Agnieszki. (predicative)  
Anna is taller from Agnieszka-<sub>GEN</sub>

<sup>8</sup> Interestingly, there have been claims that *than* incorporates a negative element historically, and perhaps the same can be said about Polish *niż* and Serbo-Croatian *nego*, though this remains a speculation.

<sup>9</sup> One of my four Polish consultants accepted *jak* in all comparatives; two judged some sentences as ? or \*, but fully accepted others, e.g. (i), and the fourth did not accept any comparative with *jak*.

- (i) a. Co może być lepszego *jak* dobraksiążka.  
what can be better wh good book  
‘Is there anything better than a good book?’
- b. Ania kupiła więcej książek *jak* Tania.  
Ania bought more books wh Tania  
‘Ania bought more books than Tania.’

Serbo-Croatian *nego-* and *od-* comparatives involve the referential and predicative partitive strategy, respectively. Both *nego* and *od* are prepositions, the counterpart of the Polish *niz* and *od*.

- (21) ‘Anna is taller than Tania.’
- a. Ana je viša nego Tanja (referential)  
 Ana is taller than Tanja<sub>NOM</sub>
- b. Ana je viša od Tanje (predicative)  
 Ana is taller from Tanja<sub>GEN</sub>

Bulgarian *ot* is like English *than* and it covers both partitive strategies. Since there is no overt case marking on full DPs, structures like (22a) are ambiguous between a reduced full-clause comparative (a referential partitive) and a reduced small-clause comparative (a predicative partitive). Case-dependency, as in (22b) is indicative of the predicative strategy.

- (22) ‘Anna is taller than Ivan/him.’
- a. Anna e po-visoka ot Ivan (referential or predicative)  
 Anna is -er-tall from Ivan
- b. Anna e po-visoka ot nego (predicative)  
 Anna is -er-tall from him<sub>ACC</sub>

In support of my claim that *nego* in Serbo-Croatian and *niz* in Polish are prepositions selecting a *wh*-clause (whether reduced by ellipsis or not), consider the fact that they allow overt clausal material in their complements, including a *wh*-operator (to the extent it is acceptable for some of the Polish speakers).

- (23) a. Marija je viša *nego* (što je) Petar  
 Maria is taller than what is Peter<sub>NOM</sub>  
 ‘Maria is taller than Peter is.’
- b. Jan waży więcej *niz* (ile) Piotr waży.  
 Ian weighs more than wh- Peter<sub>NOM</sub> weighs  
 ‘Ian weighs more than Peter does.’

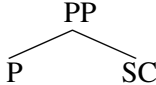
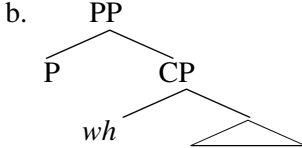
The other comparative preposition in these languages – *od* – only takes small clauses as complements, never *wh*-clauses.

- (24) a. \* Marija je viša *od* (što) je Petar  
 Maria is taller from what is Peter  
 ‘Maria is taller than Peter is.’  
 b. \* Jan waży więcej *od* (ile/jak) Piotr waży  
 Ian weighs more from wh- Pete<sub>-NOM</sub> weighs  
 ‘Ian weighs more than Peter does.’

And since Bulgarian *ot* is compatible with both types of complements, referential and predicative, clausal material, including an overt *wh*-operator, may appear overtly.

- (25) Marija e po-visoka *ot* (-kolkoto e) Ivan.  
 Maria is *-er*-tall from (-how-much is) Ivan  
 ‘Maria is taller than Ivan is.’

In sum, putting measure phrase comparatives aside for the time being, the two structures for the *than*-PP in Slavic are as in (26). (26a) is the narrow syntax/PF of predicative partitive comparatives, (26b) is the structure for referential partitive comparatives, whether reduced or not.

- (26) a.  b. 
- |           |                    |                  |  |                  |
|-----------|--------------------|------------------|--|------------------|
| <u>∅</u>  | DP <sub>-GEN</sub> | (Russian)        | <u>∅</u> <i>čem</i>  | (Russian)        |
| <u>od</u> | DP <sub>-GEN</sub> | (Polish)         | <u>niż</u> ( <sup>%</sup> <i>ile</i> ), <sup>%</sup> <u>∅</u> <i>jak</i> | (Polish)         |
| <u>od</u> | DP <sub>-GEN</sub> | (Serbo-Croatian) | <u>nego</u> ( <i>što</i> )   | (Serbo-Croatian) |
| <u>ot</u> | DP <sub>-ACC</sub> | (Bulgarian)      | <u>ot</u> ( <i>kolkoto</i> )   | (Bulgarian)      |

#### 4. A Semantic Role for *than*?

The standard view in the semantic literature is that *than* is semantically vacuous (e.g., Heim 1985, 2000, Kennedy 1999, 2001, Lechner 2001, Hackl 2000, Schwarzschild and Wilkinson 2002). Only von Stechow (1984) and Rullmann (1995) attribute to *than* a semantic role, in constructing a definite description of a degree. However, that role has

since been attributed to the *wh*-operator itself, in the free relative clause analysis of the complement of *than*. This leaves *than* with no meaning contribution. But if *than* is vacuous, and its *wh*-complement is a free relative, of type  $\langle d \rangle$ , the meaning of the PP will also be of type  $\langle d \rangle$ . This is problematic under the structure in (9a) that we are assuming. It means that the quantifier *-er* must be of type  $\langle d, \langle dt, t \rangle \rangle$  (its first argument the *than*-PP, its second argument the clause to which the DegP adjoins after QR), see (27a). This logical type makes *-er* not parallel to quantifiers over individuals, which are  $\langle et, \langle et, t \rangle \rangle$ , see (27b).

- (27) a. *-er* [than XP]  $\lambda d$  [Mary is d-tall]      *-er* :  $\langle \underline{d}, \langle dt, t \rangle \rangle$   
 b. *every* [girl]  $\lambda x$  [x smokes]                      *every*:  $\langle \underline{et}, \langle et, t \rangle \rangle$

For this reason, the meaning of *-er* is commonly given as in (28)<sup>10</sup>, making it parallel to that of quantifiers over individuals. But this denies that the complement of *than* is a definite description.

- (28)  $\llbracket -er \rrbracket = \lambda P \lambda Q \exists d [d \rangle \max(P) \text{ and } Q(d)]$       *-er* :  $\langle \underline{dt}, \langle dt, t \rangle \rangle$

A way out is to argue that the free relative analysis is wrong, after all. If the *wh*-expression is simply interpreted as a predicate of degrees, and if *than* is semantically vacuous, *-er* will be of the desired type in (28). But Bulgarian (and Polish) equatives provide a strong argument against such a possibility. Consider (29), where there is no preposition introducing the degree clause, and no overt degree quantifier either, but the degree clause is the same as the one in comparatives.

- (29) Ivan e visok kolkoto e Maria.  
 Ivan is tall      how-much is Maria  
 ‘Ivan is as tall as Maria is.’

To claim that the degree clause is a predicate of degrees is to assume that there is a null quantifier in (29). But this is problematic for at least

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<sup>10</sup> Other proposals about the semantics of *-er* also make it of type  $\langle dt, \langle dt, t \rangle \rangle$ :

- (i) a.  $\llbracket -er \rrbracket = \lambda P \lambda Q [\max(Q) > \max(P)]$   
 b.  $\llbracket -er \rrbracket = \lambda P \lambda Q \exists d [\neg P(d) \ \& \ Q(d)]$   
 c.  $\llbracket -er \rrbracket = \lambda P \lambda Q \exists [Q(d) \ \& \ \forall d' [P(d') \rightarrow d > d']]$

two reasons. The English equative in (30) is felicitous in the given context, because of the presence of the quantifier *as*. The Bulgarian putative equatives *Ivan e visok*, however, only has an absolute reading, i.e., *Ivan is tall*, and is thus not appropriate in such a context.

(30) To go on this ride you have to be at least 5 ft tall. Mary was allowed to go and John is as tall, so he should be allowed too.

The second piece of evidence against the idea of a null quantifier in (29) is that factor phrases (see (31)) are impossible in (32a), and are OK only in correlatives (cf. (32b)).

(31) John is twice *as* tall as Mary is

(32) ‘Ivan is twice as tall as Maria is.’

- a. Ivan e (\*dva pāti) visok *kolkoto* e Maria  
 Ivan is two times tall how-much is Maria
- b. Ivan e dva pāti *tolkova* visok *kolkoto* e Maria  
 Ivan is two times that tall how-much is Maria

But if there is no null quantifier in (29) to take the degree clause as its argument, the degree clause must be the argument of the adjective. In that case, it cannot be a predicate, and must denote a definite description of degrees. Thus, it is not possible to reject the free relative analysis of the degree clause. The problem persists.

#### 4.1 *Than* as a Referential Partitive Preposition

Adopting the thesis in (13) allows for a resolution. As a referential partitive preposition, *than* takes a definite description as a complement, and returns a predicate of degrees. This is also what *of* does in referential partitives, as in (14a): it takes a definite description of an individual (*the water*), and returns a predicate of individuals, which is a suitable argument for *every* (Ladusaw 1982, de Hoop 1998, Schwarzschild 2002). The meaning of referential partitive *than* will then be as in (34), parallel to that of referential partitive *of*.

- (33) a. [*of*<sub>ref-prt</sub> [DP<sub>def</sub>]]  
 b. [[*of*<sub>ref-prt</sub>]] =  $\lambda x_1 \lambda x_2$  [*x*<sub>2</sub> is part of *x*<sub>1</sub>]      *of*: <e,et>

- (34)  $\llbracket \text{than}_1 \rrbracket = \lambda d_1 \lambda d_2 [d_2 \text{ is part of } d_1]$       *than*: <d,dt>

How does the interpretation of a comparative come about with this meaning of *than*? For one, it requires an interval-based semantics for degrees, rather than a point-based semantics (as in Kennedy 2001, Schwarzschild and Wilkinson 2002). This is so, because if the *wh*-complement of *than* denotes a point on a scale, e.g., 6ft, it cannot compose with a partitive preposition – no part of a point may be taken. This is an independent argument in support of an interval-based semantics for comparatives.

Now back to the question of how meaning is calculated. The *wh*-clause denotes a definite description of an interval. The semantic role of the partitive preposition *than* is to take a part of this interval, which yields a set of intervals, i.e., a predicative expression.

There are a number of parallels between *than* and partitive *of*. Hoeksema (1984) observes that upstairs determiners in partitives are never transitive, i.e., determiners that have to have a complement (e.g., *the, a, every, no*), but determiners that may appear without a complement (e.g., *some, all, most*), as seen in (35)-(36). The same is true for *-er* – the degree clause may be missing (as seen in (37)).

- (35) a. {\*the /\*a /\*every /\*no} of the girls  
 b. {\*The /\*A /\*Every /\*No} arrived
- (36) a. {some /each /none / three } of the girls  
 b. {Some /Each /None /Three} arrived.
- (37) John is taller.

Moreover, *than* in Bulgarian is the same preposition as the one used in referential partitives (cf. (38)). The same is true for other languages.

- (38) a. Marija e po-visoka ot-kolkoto e Ivan.  
 Maria is *-er*-tall *from*-how-much is Ivan  
 ‘Maria is taller than Ivan is.’
- b. {njakoi / dve / povečeto} ot momičetata  
 some two most from the-girls  
 ‘some of the girls/ two of the girls’

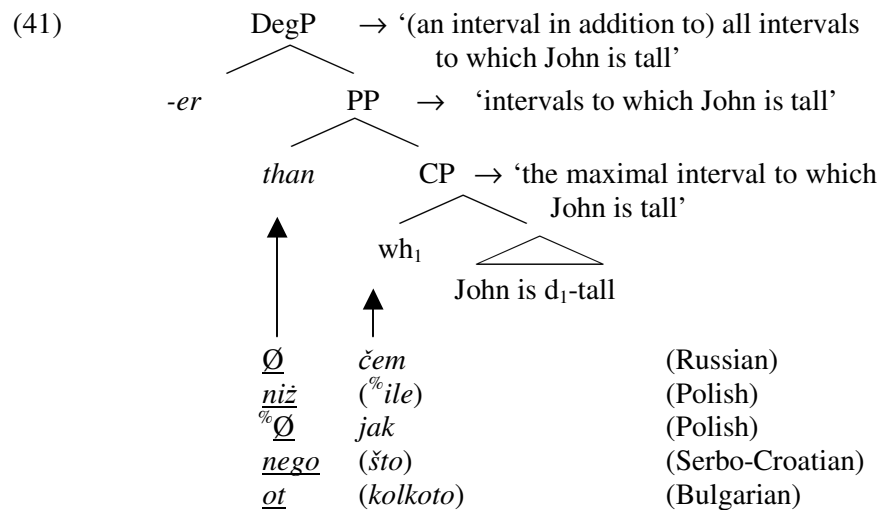
Of course, while underspecification is possible, as in Bulgarian, it is not necessary. In English, the partitive prepositions are different at PF – *than* and *of*. The same is true for Russian, Polish and Serbo-Croatian.

- (39) ‘some of the girls’
- a. nekotorye iz devoček (Russian)  
     some from girls-<sub>GEN</sub>
  - b. niektóre z dziewczyn (Polish)  
     some from girls-<sub>GEN</sub>
  - c. neke od devojaka (Serbo-Croatian)  
     some from girls-<sub>GEN</sub>

(40)

$P_{part}$ is spelled-out as:	in the syntactic structure:
<i>of, iz, z, od</i>	[ <sub>QP</sub> Q [ <sub>PP</sub> $P_{part}$ XP <sub>&lt;e&gt;</sub> ]]
<i>than, Ø, niž, nego</i>	[ <sub>DegP</sub> -er [ <sub>PP</sub> $P_{part}$ XP <sub>&lt;d&gt;</sub> ]]

The proposals about the structure and interpretation of referential partitive complements of *than* are summarized in (41).



(41) underlies clausal comparatives, and those phrasal comparatives that have a full clausal source. As expected, any constituent can appear as a remnant in the *than*-phrase, when the partitive prepositions are used.

- (42) ‘Ania is happier today than yesterday.’ (Polish)  
 a. Ania jest weselsza dzisiaj *niż* wczoraj.  
 Ania is happier today than yesterday  
 b. %Ania jest weselsza dzisiaj *jak* wczoraj.  
 Ania is happier today wh- yesterday
- (43) Ana je (još) gladnija *nego* juče (Serbo-Croatian)  
 Ana is (even) hungrier than yesterday  
 ‘Anna is (even) hungrier than yesterday’

There is no case dependency between the preposition and the remnant DP.<sup>11</sup> Exactly like the case in German in (6) above, case-matching with a constituent in the matrix clause correlates with the interpretation.

- (44) a. Ja ljubju Ivana bol’še *čem* Boris. (Russian)  
 I love Ivan<sub>ACC</sub> more wh- Boris<sub>NOM</sub>  
 ‘I love Ivan more than Boris does.’  
 b. Ja ljubju Ivana bol’še *čem* Borisa.  
 I love Ivan<sub>ACC</sub> more wh- Boris<sub>ACC</sub>  
 ‘I love Ivan more than I love Boris.’
- (45) a. Lubię Jana bardziej *niż* Ania. (Polish)  
 like<sub>1SG</sub> Jan<sub>ACC</sub> more than Ania<sub>NOM</sub>  
 ‘I like Jan more than Ania does.’  
 b. Lubię Jana bardziej *niż* Anię.  
 like<sub>1SG</sub> Jan<sub>ACC</sub> more than Ania<sub>ACC</sub>  
 ‘I like Jan more than I like Ania.’
- (46) a. Volim Petra više *nego* Ivan. (Serbo-Croatian)  
 love<sub>1SG</sub> Peter<sub>ACC</sub> more than Ivan<sub>NOM</sub>  
 ‘I love Peter more than Ivan does.’  
 b. Volim Petra više *nego* Ivana.  
 love<sub>1SG</sub> Peter<sub>ACC</sub> more than Ivan<sub>ACC</sub>  
 ‘I love Peter more than I love Ivan.’

<sup>11</sup> In Bulgarian \**ot* toj ‘from he<sub>NOM</sub>’ is not acceptable, likely because of the existence of the other partitive *ot nego* ‘from him<sub>ACC</sub>’. Also, case may be licensed across a *wh*-operator *otkolkoto nego* ‘from how-much him<sub>ACC</sub>’, which remains mysterious.



#### 4.2 *Than* as a Predicative Partitive Preposition

The parallels between *than* and partitive *of* extend further. In predicative partitives weak NPs are complements to *of*, as in (14b) (cf. Selkirk 1977, Borschev and Partee 2004, a.o.) It is clear that *of* here performs a function similar to that of classifiers. *Of* takes a description of a substance as a complement (e.g., *water*) and returns a description of parts of the substance (parts of *water*), which is further modified and quantified over by the upstairs container phrase (e.g., *a glass*).

- (47) a. [ $of_{\text{pred-prt}}$  [NP]]  
 b. [[ $of_{\text{pred-prt}}$ ]] =  $\lambda P_{\langle e, t \rangle} \lambda x$  [x is part of P]      *of*:  $\langle et, et \rangle$

Parallel to the meaning in (47), we posit a meaning for predicative partitive *than* as in (48). This *than* will take a set of degrees as a complement and return a part of it, i.e., a set of degrees.

- (48) [[ $than_2$ ]] =  $\lambda P_{\langle d, t \rangle} \lambda d$  [d is part of P]      *than*:  $\langle dt, dt \rangle$

Support for this proposal comes from underspecification in Russian. The realization of predicative partitives is the same in the domain of individuals and of degrees. Similar facts obtain in Finnish.

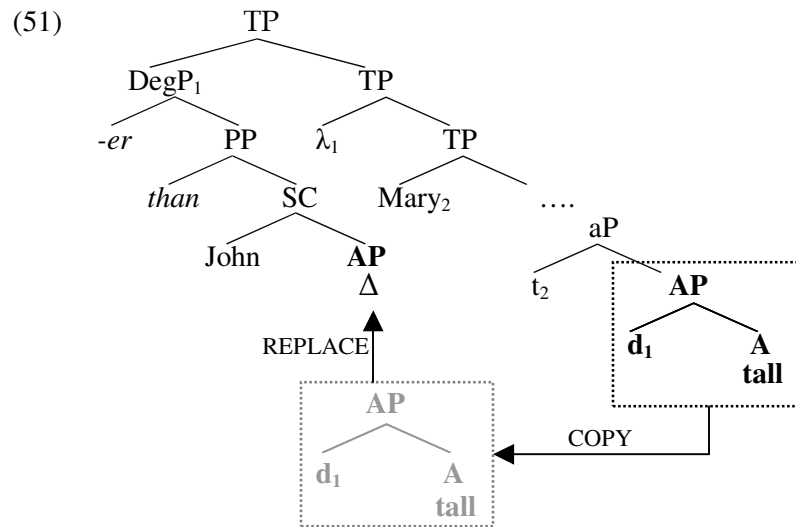
- (49) a. Anna vyše Ivana.                      (Russian)  
       Anna taller Ivan.<sub>GEN</sub>  
       ‘Anna is taller than Ivan’  
 b. tri {litra vody / gruppy devoček}  
       3 liters water-<sub>GEN</sub> groups girls-<sub>GEN</sub>  
       ‘3 liters of water’ / ‘3 groups of girls’

As we discussed earlier, underspecification is not a necessity, so the fact that in English, Polish, Serbo-Croatian and Bulgarian the predicative partitive strategy is distinct in the domain of individuals and of degrees, should not be taken as undermining the proposal.

- (50) ‘3 groups of girls’  
 a. trzy grupy dziewczyn                      (Polish)  
       3 groups girls-<sub>GEN</sub>

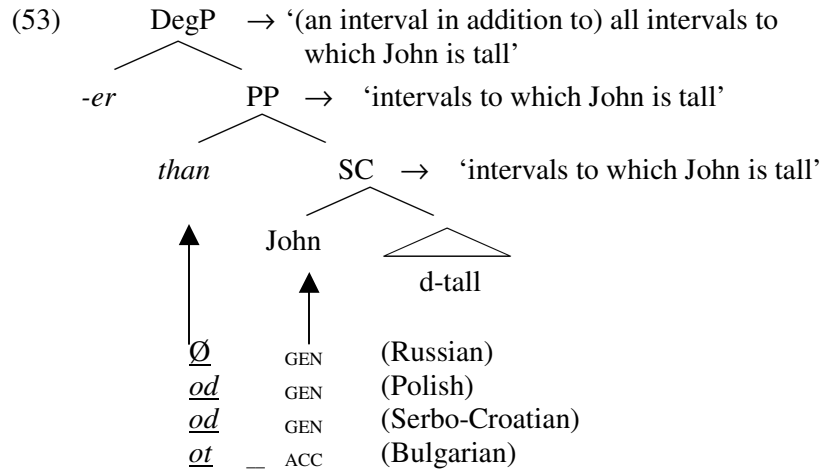
- b. tri grupe devojaka (Serbo-Croatian)  
 3 groups girls<sub>-GEN</sub>  
 c. tri grupi momičeta (Bulgarian)  
 3 groups girls

Let us turn now to the mechanism of LF-copying that supplies the predicative partitive *than* with an argument of the right type. *-er* QRs, merges with the *than*-PP, and then the DegP merges at the root node (observing the Extension Condition). AP from the matrix is then copied into the small clause complement of *than*, as in (51).



Note that in (51) the AP contains a trace of the QR-ed DegP, which is interpreted as a variable of type  $\langle d \rangle$ . The subject trace is outside of the copied structure. When the copied AP recovers the content of the predicate in the *than*-PP, the small clause is interpreted as a predicate of degrees, exactly what is needed as a complement to the predicative partitive preposition, see (52). (53) illustrates the predicative comparative in Slavic.

- (52) a. [<sub>A</sub> tall]:  $\lambda d \lambda x$  (x is tall to d)  
 b. [<sub>AP</sub> d<sub>1</sub>-tall]:  $\lambda x$  (x is tall to d)  
 c. [<sub>SC</sub> John d<sub>1</sub>-tall]:  $\lambda d$  (John is tall to d)



In predicative partitive comparatives, the DP is case dependent on the preposition, as one would expect, as the small clause is transparent for case-licensing from a selecting head.<sup>12</sup> Moreover, the genitive DP can get different correlates from the matrix clause, resulting in ambiguities. Compare the sentences below with (44)-(46).

- (54) a. Ja ljubju Ivana bol’še Borisa. (Russian)  
 I love Ivan<sub>-ACC</sub> more Boris<sub>-GEN</sub>  
 ‘I love Ivan more than {Boris does/I love Boris}.’
- b. Lubię Jana bardziej od Agnieszki. (Polish)  
 like<sub>-1sg</sub> Jan<sub>-ACC</sub> more from Agnieszka<sub>-GEN</sub>  
 ‘I like Jan more than {Agnieszka does /I like Agnieszka}.’
- c. Volim Petra više od Tanje. (Serbo-Croatian)  
 love<sub>-1sg</sub> Peter<sub>-ACC</sub> more from Tanja<sub>-GEN</sub>  
 ‘I love Peter more than {Tanja does/I love Tanja}.’
- d. Običam Ivan poveče ot neja. (Bulgarian)  
 love<sub>-1sg</sub> Ivan more from her<sub>-ACC</sub>  
 ‘I love Ivan more than {she does/I love her}.’

<sup>12</sup> For Russian, I am assuming that the preposition is null, and is licensing genitive case. Alternatively, *-er* itself may be implicated (see Bailyn (in press) for arguments that a quantificational head licenses genitive case in general).

The ambiguity of the above sentences arises in the following way. Taking (54a) as an example, the structure underlying both readings is as in (55a)=(56a). The genitive DP has an anaphor as its sister, whose content needs to be recovered by copying an antecedent. Depending on what expression is copied, one or the other reading arises. The meaning where the correlate of the genitive DP is the subject of the matrix is derived as in (55). The matrix VP is copied into the small clause. The VP has the meaning  $\lambda x \lambda d_1 x \text{ love Ivan } d_1\text{-much}$ . It is predicated of the genitive DP, and the DP thus saturates the external argument of *love*. Because the VP contains a degree variable, the small clause is interpreted as a predicate of degrees, i.e.,  $\lambda d_1 \text{ Boris love Ivan } d_1\text{-much}$ .

- (55) a.  $[_{IP} I [_{VP} \text{love Ivan } d_1\text{-much}]] -er_1 [_{SC} \text{Boris } \Delta]$   
 b.  $[_{IP} I [_{VP} \text{love Ivan } d_1\text{-much}]] -er_1 [\text{Boris } [_{VP} \text{love Ivan } d_1\text{-much}]]$

The second reading of (54a) is derived as in (56). The initial structure is the same as the one underlying the first reading (see (56a)=(55a)). *Ivan*, the direct object of the matrix verb and the correlate of the genitive DP in this reading, is topicalized in the matrix clause. Its sister IP is then copied into the small clause. This IP is a predicate with the meaning  $\lambda x \lambda d_1 I \text{ love } x d_1\text{-much}$ . The IP is predicated of the genitive DP, and the DP saturates the internal argument of *love*. As a result, the small clause is interpreted as the predicate of degrees  $\lambda d_1 I \text{ love Boris } d_1\text{-much}$ .

- (56) a.  $[_{IP} I [_{VP} \text{love Ivan } d_1\text{-much}]] -er_1 [_{SC} \text{Boris } \Delta]$   
 b.  $[_{IP} \text{Ivan}_2 [_{IP} I \text{love } t_2 d_1\text{-much}]] -er_1 [\text{Boris } [_{IP} I \text{love } t_2 d_1\text{-much}]]$

The above illustration shows that arguments of the gradable predicate can be readily interpreted in the *than*-phrase. What about adverbials? We saw that temporal adverbials are acceptable in phrasal referential partitives ((42), (43)). Predicative partitives, however, do not allow adverbials in the *than*-phrase, in at least some of the languages.<sup>13</sup>

<sup>13</sup> A reviewer offers (i) from Russian, where an adverbial is acceptable. The reviewer also notes that other temporal adverbials are not acceptable, e.g., *prošlogodnego* 'last year<sub>ADJ.GEN</sub>', nor are place adverbials, e.g., *moskovskogo* 'MOSCOW<sub>ADJ.GEN</sub>'.

(i) Maša segodnja veselee včerašnego.  
 Masha today jollier yesterday<sub>ADJ.GEN</sub>  
 'Masha is jollier today than yesterday.'

- (57) a. \*Ania jest weselsza dzisiaj *od wczoraj*. (Polish)  
 Ania is happier today from yesterday  
 ‘Ania is happier today than yesterday.’
- b. \*Ana je (još) gladnija *od juče* (Serbo-Croatian)  
 Ana is (even) hungrier than yesterday  
 ‘Ana is even hungrier than yesterday.’

Presumably, a structure as in (58) would yield the required meaning for (57a). The structure is interpretable, so the ungrammaticality of (57a) is likely due to a syntactic reason: case-resistance on the part of *yesterday*, or a problem with the topicalization of the adverb. Clearly, more work is needed here, especially in light of the cross-linguistic facts.

(58) [today<sub>2</sub> [A. is d<sub>1</sub>-happy t<sub>2</sub>]] -er<sub>1</sub> than [yesterday [A. is d<sub>1</sub>-happy t<sub>2</sub>]]

Finally, let us return to the Russian analytic/synthetic alternation and the distribution of the two types of comparatives. Recall that what we are now calling predicative partitives can occur only in synthetic comparatives, whereas the referential partitives are acceptable in both analytic and synthetic comparatives (cf. (10) and the surrounding discussion). At this point it is necessary to note that analytic comparatives in Russian are associated with the interpretation that the positive form of the adjective is true of the main clause subject (Matushansky 2001). Thus, (10a) may not be preceded by *Germann is not strong but...* While a detailed analysis will not be offered here, the present proposal can capture the split in the right way. The structural property that is responsible for the ‘positive’ interpretation, whatever it may be, prevents the morphological merger of *-ee* and the adjective, and necessitates the insertion of *bol-*. Copying will introduce the relevant syntactic entity into the predicative partitive without providing the opportunity for its lexicalization, resulting in unacceptability.

## 5. Measure Phrase Comparatives

Under the reduced clause analysis, measure phrase comparatives too are clausal remnants (cf. Hackl 2000). In other words, they have the structure in (59), where (59b) is the result of QR of the DegP.

- (59) a. Mary is [-er than [<sub>CP</sub> wh<sub>1</sub> 5ft is ~~d<sub>1</sub>-much~~]] tall  
 b. [-er [ $\lambda$ d<sub>1</sub> (5ft is d<sub>1</sub>-much)]]  $\lambda$ d<sub>2</sub> Mary is d<sub>2</sub>-tall.

However, the *wh*-operator is not acceptable in measure phrase comparatives in Slavic. We already saw this in (12) from Russian. The same facts obtain in the other Slavic languages under discussion here.

- (60) ‘Ivan is taller than 2m.’ (Bulgarian)  
 a. ⊗ Ivan e po-visok ot-kolkoto 2m.  
     Ivan is -er-tall from-how-much 2m  
 b. Ivan e po-visok ot 2m.  
     Ivan is -er-tall from 2m
- (61) ‘Ivan is taller than 2m.’ (Serbo-Croatian)  
 a. ⊗ Ivan je viši nego što 2 metra  
     Ivan is taller than what 2 meters  
 b. ?? Ivan je viši nego 2 metra  
     Ivan is taller than 2 meters  
 c. Ivan je viši od 2 metra  
     Ivan is taller from 2 m
- (62) ‘Ania is taller than 5 feet’ (Polish)  
 a. Ania jest wyższa niż 5 stop.  
     Ania is taller than 5 feet  
 b. ⊗ Ania jest wyższa niż ile 5 stop.  
     Ania is taller than wh- 5 feet  
 c. ⊗ Ania jest wyższa jak 5 stop.  
     Ania is taller wh- 5 feet  
 d. \* Ania jest wyższa od 5 stop.  
     Ania is taller from 5 feet

The obligatory absence of *wh*-operators in Slavic is most naturally explained if the full clausal structure is never used for them. But this also does not mean that they have to employ the strategy of LF copying of material from the matrix clause. Because of the inherent semantics of measure phrases, they can be given a direct analysis.

Schwarzschild (2004) points out that we use measure phrases such as *5 feet* in two ways: as a name of a point on a scale, similarly to *5 o'clock*

in the temporal domain), or as a predicate of scale intervals, similarly to *5 hours* in the temporal domain. The former, of type  $\langle d \rangle$ , when directly selected by the referential partitive preposition *than*, will yield the right interpretation (cf. (63a)). The latter, of type  $\langle d, t \rangle$ , when directly selected by the predicative partitive preposition, will also yield the right interpretation (cf. (63b)).

- (63) a.  $\max(\lambda d (d \leq '5ft'))$   
 b.  $\lambda d (d \leq '5ft')$

We also note that there is cross-linguistic variation in Slavic in the grammar of measure phrases. Apparently, measure phrases in Russian and Serbo-Croatian are treated as predicates of degrees (cf. (63b)), whereas in Polish they are treated as definite descriptions of degrees (cf. (63a)), at least as far as comparatives are concerned. In Bulgarian we cannot tell, as the two partitive prepositions have the same form. In Russian, the explanation for this fact is probably due to the obligatoriness of the *wh*-operator in referential partitives. Since a clausal structure is precluded for measure phrases in comparatives, the only option for measure phrases in Russian is to be used in the predicative partitive structure. The situation in Serbo-Croatian and Polish, though, is surprising, in particular because *nego* and *niż* have so far exhibited the same syntactic and semantic behavior. Similarly for the two *od* prepositions in these languages, which presumably even originate from the same historical source. I do not have an explanation of the cross-linguistic variation at this point.

## 6. Summary

The structures of comparatives in Slavic that I argued for in this paper are summarized in the table below:

Russian	Polish	Serbo-Croatian	Bulgarian
$\emptyset$ [ <sub>CP</sub> <i>čem...</i> ]	<i>niż</i> [ <sub>CP</sub> ( <sup>%</sup> <i>ile</i> )...]] <sup>%</sup> $\emptyset$ [ <sub>CP</sub> <i>jak ...</i> ]	<i>nego</i> [ <sub>CP</sub> ( <i>što</i> )..]	<i>ot</i> [ <sub>CP</sub> ( <i>kolkoto</i> )..]
$\emptyset$ [ <sub>SC</sub> DP <sub>GEN</sub> Δ]	<i>od</i> [ <sub>SC</sub> DP <sub>GEN</sub> Δ]	<i>od</i> [ <sub>SC</sub> DP <sub>GEN</sub> Δ]	<i>ot</i> [ <sub>SC</sub> DP <sub>ACC</sub> Δ]

The most important consequences of this proposal are as follows. (i) A novel argument is given in favor of the classical architecture of comparatives, as the relation between *-er* and the *than*-expression is shown to be parallel to that between a quantifier and its partitive first argument. (ii) A novel argument is offered for change to an interval-based semantics for degree predicates, from the more standardly assumed point-based one. And finally, (iii) a novel argument is provided about grammatical parallels between the domains of degrees and individuals, suggesting uniformity of certain core mechanisms of grammar.

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