

More than one comparative in more than one Slavic language: an experimental investigation

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1 Introduction

The focus of this paper is on comparatives like *more than five sandwiches* in (1) (Barwise and Cooper 1981, Krifka 1999, Hackl 2000, Geurts and Nouwen 2007, Matushansky and Ionin 2011). These expressions, which we will be calling *amount comparatives*, have previously been observed to be ambiguous between *many* readings (where *more than five sandwiches* means ‘six or more sandwiches’) and *much* readings (where it means ‘something more substantial than five sandwiches’). The two readings can be brought out by the continuations in (1a,b), respectively.

- (1) I ate more than five sandwiches...
- a. ‘*many* reading’: I ate six!
 - b. ‘*much* reading’: I ate five sandwiches plus a bowl of soup!

Whereas English amount comparatives have both readings available to them, in Russian, the availability of *many* vs. *much* readings depends on the type of comparative: phrasal (*more*+Genitive-marked NP) vs. clausal (*more*+wh-expression) (cf. Heim 1985, Lechner 1998, 2001, Pancheva 2006). Only the clausal amount comparative has the *much* reading (2a), while the phrasal amount comparative has only the *many* reading (2b) (from Matushansky and Ionin 2011).

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- (2) a. Ja s'jela bol'se, čem pjat' buterbrodov.
 I ate more than five-ACC sandwiches.
 √*'many reading'*, √*'much reading'*
 b. Ja s'jela bol'se pjati buterbrodov.
 I ate more five-GEN sandwiches
 √*'many reading'*, #*'much reading'*

Matushansky and Ionin (2011) further observe that in English, amount comparatives can combine with referential expressions, as in (3). In Russian, only the comparative type that is compatible with the *much* reading (the clausal comparative) is compatible with referential expressions, as shown in (4a-b) vs. (4c-d).

- (3) a. I invited more than (just) Peter and Mary.
 b. I read more than these five books.
 (4) a. Ja priglasila bol'se, čem Petju i Mašu.
 I invited more than Peter-ACC and Mary-ACC
'I invited more than Peter and Mary.'
 b. Ja pročitala bol'se, čem èti pjat' knig.
 I read more than these five-ACC book-GEN.PL
'I read more than these five books.'
 c. *Ja priglasila bol'se Peti i Maši.
 I invited more Peter-GEN and Mary-GEN
 d. *Ja pročitala bol'se ètix pjati knig.
 I read more these five-GEN book-GEN.PL

Matushansky and Ionin (2011) propose that all amount comparatives have the bracketing in (5), where the comparative combines with a cardinal-containing NP, analyzed as having the semantic type of predicates ($\langle e, t \rangle$) (Ionin and Matushansky 2006; cf. Landman 2003; Geurts and Nouwen 2007). The proposal that the cardinal forms a unit with the lexical NP, rather than with the comparative (contra Generalized Quantifier theory, Barwise and Cooper 1981), is based both on the syntactic behavior of amount comparatives cross-linguistically (Arregi 2010) and on the semantic analysis of cardinals proposed in Ionin and Matushansky (2006). See Matushansky and Ionin (2011) for discussion of the relevant evidence.

(5) [more than [five sandwiches]]

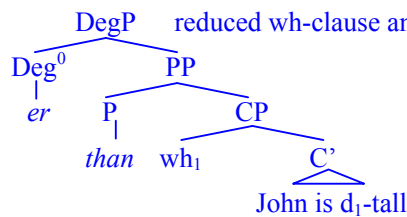
Here, we propose that the bracketing in (5) can correspond to two distinct structures, small clauses and degree phrases (cf. Pancheva 2006), with systematic cross-linguistic differences in terms of which structure(s) are available to which amount comparative type(s). Our

goals are as follows: (i) to provide evidence for the availability of two distinct structures for amount comparatives; (ii) using experimental methodology, to determine the availability of *many* and *much* readings for amount comparatives in English, Russian, Bulgarian, Polish and Czech, as well as to determine which comparative types are compatible with referential expressions; and (iii) based on the experimental data, to determine which structure(s) are available to which type(s) of amount comparatives.

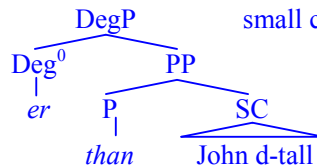
2 Analyses of comparative expressions

According to Pancheva (2006), comparative expressions allow for three distinct complements of *than*: a reduced wh-clause ((6), for (9a); in English, the complementizer is null), a small clause ((7), for (9b)), or a measure DegP ((8), for (9c)).¹

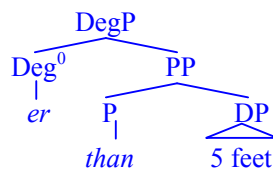
(6) reduced wh-clause analysis of (9a)



(7) small clause analysis of (9b)



(8) degree analysis of (9c)



¹ To ensure that the complement of the preposition in (6) and (7) denotes a degree, we assume the presence of a null operator on the left periphery of that complement. Its presence is not reflected in the trees in (6) and (7), from Pancheva (2006). The same holds for the trees in (19) below.

- (9) a. Mary is taller than John is. [reduced wh-clause]
 b. Mary is taller than John. [small clause]
 c. Mary is taller than 5 feet. [DegP]

According to Pancheva (2006, to appear), Slavic languages distinguish between *clausal* comparatives that take wh-clause complements (6) and *phrasal* comparatives that take small-clause complements (7). Pancheva proposes that Russian *čem* (10a), Bulgarian *kolkoto* (11a) and Polish *niż* (12a) all take reduced clause complements (6), as evidenced by the fact that they do not assign case and allow clause-level elements such as auxiliaries and temporal verbs. (Pancheva analyzes both *čem* and *kolkoto* as wh-operators; *niż* is a preposition which can, for some speakers, co-occur with the wh-complementizer *ile*). In contrast, phrasal comparatives, including Russian Genitive (10b), Bulgarian *ot* (11b) and Polish *od* (12b) all take small clause complements (7), as evidenced by the fact that they assign Case and disallow clause-level elements.

- (10) a. Maša rabotaet segodnja lučše, čem Petja
 Mary works today better than Peter-NOM
 (rabotal) včera.
 worked yesterday
 'Mary works today better than Peter (did) yesterday.'
 b. Maša rabotaet segodnja lučše Peti
 Mary works today better Peter-GEN
 (*rabotal) (*včera).
 worked yesterday
 'Mary works today better than Peter.'
 (11) a. Tja e po-visoka ot-kolkoto e toj.
 she is er-tall from-how.much is he-NOM
 'She is taller than he is.'
 b. Tja e po-visoka ot nego.
 she is er-tall from him-ACC
 'She is taller than him.' (Pancheva to appear, ex. 3)
 (12) a. Jan waży więcej niż Agnieszka (waży).
 Ian weighs more than Agnieszka-NOM weighs
 'Ian weighs more than Agnieszka (does).'
 b. Jan waży więcej od Agnieszki.
 Ian weighs more from Agnieszka-GEN
 'Ian weighs more than Agnieszka.'
 (Pancheva to appear, ex. 2)

We observe that it is not possible to rule out the possibility that

Russian *čem* and Polish *niż* can also combine with small clause complements. E.g., in (10a) or (12a), if there is no verb or adverb, *Petja/Agnieszka* could in principle be in a small clause instead of a wh-clause. This would mean that a small clause can contain a wh-complementizer (cf. Starke 1995). In contrast, Bulgarian *ot-kolkoto* clearly requires a reduced clause complement: a remnant object by itself is disallowed (13) (Roumyana Pancheva, p.c.). (Without *kolkoto*, *ot* disallows a reduced-clausal complement, except colloquially, providing evidence for a small-clause analysis.)

- (13) Maria včera kupi poveče knigi ot-kolkoto
 Mary yesterday bought more books from-how.much
 Petür ^{*/??}(kupi) / (dnes).
 Peter bought today
'Mary bought yesterday more books than Peter did today.'

Turning to the DegP structure in (8), the test for its availability is the ability to combine with measure phrases. In Bulgarian, *ot* can combine with measure phrases, but *ot-kolkoto* cannot ((14), from Pancheva 2006, ex. 60; Pancheva 2006 defines ⊗ as “Probably grammatical – the grammar doesn’t exclude it – yet strongly unacceptable”). In Russian, the Genitive can combine with measure phrases, but *čem* cannot ((15), from Pancheva 2006, ex. 12). However, we note that in other contexts, *čem* does take a measure phrase complement (16). Finally, in Polish, *od* cannot take a measure-phrase complement; *niż* can, but without a wh-complementizer ((17), Pancheva 2006, ex. 62).

- (14) Ivan e po-visok ot-(⊗kolkoto) 2m.
 Ivan is er-tall from 2m
'Ivan is taller than two meters.'
- (15) a. Ivan rostom bol'she dvux metrov.
 Ivan in-height more two-GEN meters-GEN
'Ivan measures in height more than two meters.'
 b. ⊗ Ivan rostom bol'she, čem dva metra.
 Ivan in-height more than two-NOM/ACC meter-PAUC
- (16) ... diametr kupola namnogo bol'she, čem dva metra.
 ... diameter dome a-lot more than two meter
'... the diameter of the dome is a lot more than two meters.'
 [source: vott.ru/entry/151458]
- (17) a. Ania jest wyższa niż (#ile/jak) 5 stop.
 Ania is taller than wh 5 feet
'Ania is taller than five feet.'

- b. * Ania jest wyższa od 5 stop.
 Ania is taller from 5 feet

The above discussion is summed up in Table 1 (based on Pancheva 2006, with modifications). We next turn to the availability of these structures for amount comparatives.

Table 1. Structures available to comparatives cross-linguistically

	Russian	Bulgarian	Polish
reduced wh-clause	Ø [CP čem...]	ot [CP (kolkoto)...]	niż [CP (%ile)...]
small clause	Ø [SC DP _{GEN} Δ] maybe: Ø [SC čem DP _{NOM} Δ]	ot [SC DP _{ACC} Δ]	od [SC DP _{GEN} Δ] maybe: niż [SC DP _{NOM} Δ]
DegP	Ø [DP _{GEN}]	ot [DP _{ACC}]	niż [DP _{NOM}]

3 Analyses of amount comparatives

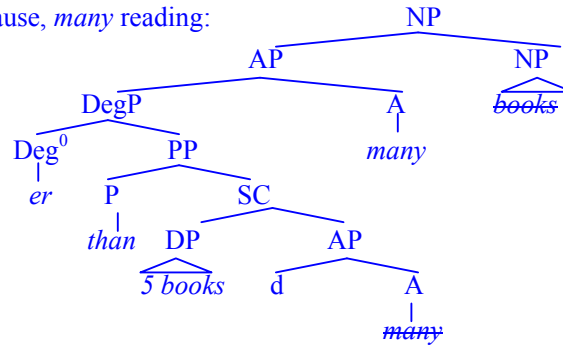
3.1. Structure of amount comparatives in English

We first consider English amount comparatives like *more than five sandwiches*, and note that they cannot contain material such as auxiliaries or temporal adverbs (18b), unlike other types of comparatives (18a). This provides evidence that amount comparatives cannot have a reduced-clause structure (6), and have instead a small-clause structure (7) or a DegP structure (8).

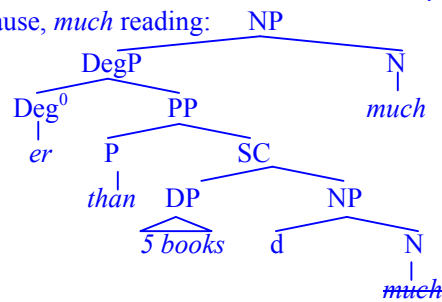
- (18) a. Today, Mary ate more than Peter (did) (yesterday).
 b. Today, Mary ate more than five sandwiches (*did) (*yesterday). *cannot mean 'Mary ate something today which is more than the five sandwiches that she ate yesterday.'*

In Matushansky and Ionin (2011), building on Pancheva (2006), we propose (19) as the small-clause analysis of amount comparatives; (19) is compatible with both *many* readings (19a) and *much* readings (19b), which, as we have seen, are both available for English (see (1)). The fact that *five books* in (19) is a regular subject and therefore can have type *e* or type $\langle\langle e, t \rangle, t \rangle$ accounts for the availability of referential expressions inside amount comparatives (see (3)).

(19) a. small clause, *many* reading:



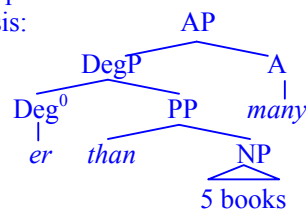
b. small clause, *much* reading:



With regard to the DegP structure, in Matushansky and Ionin (2011), we hypothesize that an amount NP predicate can be converted into a degree (20), with the corresponding structure in (21). We further hypothesize that this degree is compatible with totally ordered scales, like *many* (as opposed to *much*, whose domain is only partially ordered), and that as a result, DegP comparatives lack *much* readings. On the assumption that referential expressions cannot be converted into degrees, the DegP structure is incompatible with referential expressions inside amount comparatives.

(20) $P_{\langle e,t \rangle} \rightarrow \iota d \text{ s.t. } \forall x [P(x) \rightarrow d = \max \{d' : Q(d',x)\}]$ where Q is contextually provided

(21) DegP analysis:



3.2. Structure of amount comparatives in Slavic

On the diagnostics in the previous section, the fact that Russian phrasal (Genitive-assigning) amount comparatives lack the *much* reading (2b) and cannot combine with referential expressions (4c,d) suggest that they are compatible only with the DegP analysis (21), and not the small clause analysis (19). In contrast, the fact that clausal *čem* amount comparatives have *much* readings (2a) and can combine with referential expression (4a,b) indicate that they *are* compatible with the small-clause structure (19).²

In Matushansky and Ionin (2011), we assumed that *čem* amount comparatives can actually have a reduced clause structure. However, there are two problems with this. First, as in English (18), *čem* amount comparatives can never combine with clause-level elements such as temporal adverbs (22), unlike other types of *čem* comparatives (10a). Second, *čem* amount comparatives are transparent to case assignment, (23), which argues in favor of the small-clause analysis in (19).

- (22) Maša s'jela segodnja bol'se, čem pjat'
 Mary ate today more than five-NOM/ACC
 buterbrodov (*včera).
 sandwiches-GEN yesterday
 'Mary ate today more than five sandwiches.'
- (23) a. Maša pročitala bol'se, čem tysjaču knig.
 Mary read more than thousand-ACC books-GEN
 'Mary read more than a thousand books.'
- b. Maša pol'zovala's' bol'se, čem pjat'ju mašinami.
 Mary used-REFL more than five-INSTR cars-INSTR
 'Mary made use of more than five cars.'

Based on the data from English and Russian, we hypothesize that amount comparatives cross-linguistically cannot have the reduced clause structure. The only options are the small clause structure (19) and the DegP structure (21). In light of this, we predict that Bulgarian *ot-kolkoto* should be incompatible with amount comparatives: *ot-kolkoto* comparatives require a reduced clause complement (see

² Given the grammaticality of (16), where *čem* appears with a measure phrase, the question arises of whether the DegP structure in (21) is available for Russian *čem* comparatives. However, given that such examples are quite marginal, we assume that in examples like (16), *čem* in fact takes a small-clause complement. An additional argument in favor of this hypothesis is the implausibility of having a wh-element combining with a DegP.

(13)), but per our hypothesis, the reduced clause structure is unavailable for amount comparatives. Furthermore, *ot-kolkoto* is incompatible with measure phrases (see (14)), which rules out the DegP structure in (21). In contrast, Bulgarian *ot* comparatives – which are not restricted to reduced clause complements – should be available for amount comparatives, and should in principle have both the small clause structure (19) and the DegP structure (21) available to them, allowing for both *many* and *much* readings.

Turning to Polish, given that *od* comparatives cannot combine with measure phrases (see (17)), we expect the DegP structure in (21) to be unavailable for them. The small-clause structure in (19) may in principle be available to both *od* and *niż* amount comparatives. Finally, Czech has only one type of comparative, with *než*; it is not discussed in Pancheva (2006), but given what Pancheva (2006) says about the behavior of related elements in Polish (*niż*) and Serbo-Croatian (*nego*), we expect Czech *než* amount comparatives to be available, and to allow for both small-clause and DegP structures.

4 Experimental study

We conducted an exploratory experimental study on amount comparatives, in order confirm the facts discussed above for English and Russian, as well as to test the above predictions for Bulgarian, Polish and Czech. Our study examined the ability of comparatives to combine with both indefinite and referential amount expressions. We tested availability of *many* and *much* readings, furthermore dividing *much* readings into two types, which we are terming *additive much* (where *more than five sandwiches* means ‘five sandwiches plus something else’) and *replacement much* (where it means ‘something other than five sandwiches, which is bigger than five sandwiches’ – e.g., a three-course meal).

4.1. Experimental materials

A context-based Acceptability Judgment Task (AJT) was presented via the web using the survey gizmo tool. Each test item consisted of a short context about A and B, where A asks a question, and B responds, using an amount comparative in the response. B’s response establishes whether the amount comparative has the *many*, *additive much*, or *replacement much* reading. The contexts were presented in English (to enable the use of a single survey for all participants); the target sentence (e.g., *I read more than five books*) was presented in all five languages, and in all eight types of amount comparatives

under investigation (two types of comparatives each for Russian, Bulgarian and Polish, one each for English and Czech), as shown in the sample item in Figure 1. Participants were instructed to rate only the sentence(s) in their native language, using a scale from 1 (unacceptable in the context) to 7 (acceptable in the context).

13. Context: A and B are both students; B has been studying hard for exams, and A heard from a mutual friend that B read five books last week.

A: Is it true that you read five books during last week?
 B: Actually, I read more than five books. I read ten books!

	1	2	3	4	5	6	7
English: I read more than five books.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Russian: Я прочитал больше пяти книг.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Russian: Я прочитал больше, чем пять книг.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bulgarian: Прочетох повече от пет книги.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bulgarian: Прочетох повече отколкото пет книги.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Czech: Četl jsem víc než pět knih.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Polish: Przeczytałem więcej od pięciu książek.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Polish: Przeczytałem więcej niż pięć książek.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 1: sample test item, for the *many* reading

The two factors varied in the task were (1) the form of the NP inside the amount comparative (indefinite: *five books* vs. demonstrative: *these five books* vs. conjoined proper names: *Moby Dick* and *Les Misérables*); and (2) the type of reading (*many* vs. *additive much* vs. *replacement much*, established by the continuation). Thus, there were nine test categories (3 NP types crossed with 3 types of readings), as well as one baseline category, in which the target sentence was not followed by any continuation. Sample items for each category are given in (24) through (27), for English.

- (24) **Baseline category:** A and B are both students; B has been studying hard for exams, reading a lot.
 A: How many books did you read during last week?
 B: I don't remember exactly, but I know this: *I read more than five books*.
- (25) **Indefinite in amount comparative:** A and B are both students; B has been studying hard for exams, and A heard from a mutual friend that B read five books last week.
 A: Is it true that you read five books during last week?
 B: Actually, I read more than five books.
 I read ten books! [*many* reading]
 I read five books plus ten journal articles! [*additive much* reading]

- Instead of reading books, I read forty journal articles!
[*replacement much reading*]
- (26) **Demonstrative expression in amount comparative:** A and B are both students. A comes in and finds that B has a stack of five books on the table, and A wants to know if B read them.
A: Is it true that you read these five books during last week?
B: Actually, I read more than these five books.
I read ten books! [*many reading*]
I read these five books plus ten journal articles! [*additive much reading*]
Instead of reading these books, I read forty journal articles!
[*replacement much reading*]
- (27) **Conjoined proper name in amount comparative:** A and B are both students; A heard that B read two long books, “Moby Dick” and “Les Miserables”, last week.
A: Is it true that you read “Moby Dick” and “Les Miserables” during last week?
B: Actually, I read more than “Moby Dick” and “Les Miserables”.
I read five books! [*many reading*]
I read “Moby Dick” and “Les Miserables”, and three other books besides. [*additive much reading*]
Instead of reading “Moby Dick” and “Les Miserables”, I read all sixty volumes of my encyclopedia! [*replacement much reading*]

Each of the ten categories was exemplified by four tokens (about reading books, watching plays, visiting capital cities, and photographing paintings). The items were not randomized (all items about reading books were presented one after another, followed by all items about watching plays, and so on). This was done so that the participants could explicitly compare the behavior of the same comparative expression across contexts.

4.2. Participants

Participants were recruited using Linguist List and the Slavic Linguistics Society list, and were provided with the url for the test. The participants resided in many different countries; all were fluent in English, and all responded only to the variants in their native language. Only results from participants who completed the test to the end were included in the analysis. The total number of native speakers included in the data analysis was 51 for English, 24 for

Russian, 11 for Bulgarian, five for Polish and six for Czech. If any of these participants missed an item, their average response was computed based on the other items in the corresponding category (only six of the 97 participants ever missed an item, and none missed more than one item within a single category).

4.3. Results

The mean ratings (on a scale from 1 to 7) for all categories and all comparative types, across languages, are provided in the Appendix. Here, we summarize the main findings, based on both numerical ratings and statistical analyses, which were ANOVA tests comparing performance across different categories within each language (for reasons of space, we do not report the statistical results here; the alpha level of statistical significance was set at .05).

In English, significantly higher ratings were obtained with both *many* and *additive much* readings (ratings above 5.0) than with *replacement much* readings (ratings below 3.0). For indefinite amount comparatives (25), *many* readings were rated significantly higher than *additive much* readings, but both were rated quite high (6.54 vs. 5.49). Amount comparatives over referential expressions ((26)-(27)) also received high ratings (above 5.0), with both *many* and *additive much* readings.

In Russian, Genitive comparatives received high ratings (above 5.0) only in the baseline category (24) and for comparatives over indefinites (25) with *many* readings. Genitive comparatives over referential expressions, and/or with *much* readings, were rated much lower. In contrast, for *čem* comparatives, all readings received fairly high ratings (but higher for comparatives with indefinites and demonstratives ((25)-(26)) than with proper names (27)). For both comparatives, *replacement much* readings were rated significantly below *additive much* readings; but for Genitive comparatives, *additive much* readings also received very low ratings (3.65 with indefinites), significantly below *many* readings; for *čem* comparatives, both *much* readings were rated high (above 5.0).

In Bulgarian, *ot* comparatives received significantly higher ratings with both *many* and *additive much* readings (4.6 and above), than with *replacement much* readings (4.5 and below), for all NP types. *Ot-kolkoto* comparatives were rejected in the baseline category (mean rating 2.62) and received fairly low ratings across the board, especially for indefinites with *many* readings (1.73); all other ratings were between 3.0 and 4.5.

In Czech, *než* comparatives received significantly higher ratings with both *many* and *additive much* readings (4.5 and above) than with *replacement much* readings (3.0 and below), for all NP types. And in Polish, *od* comparatives were rejected in the baseline category (mean rating 1.05) and received low ratings across the board (below 4.0); for *niż* comparatives, all readings, with all comparative types, were relatively acceptable (mean ratings above 4.0), with no clear patterns and no significant effects.

4.4. Discussion

Overall, two distinct patterns were found in the data. The first pattern, exhibited only by Russian Genitive comparatives, involved high ratings for indefinites with *many* readings, compared to everything else. This pattern is expected if Russian Genitive amount comparatives are compatible only with the DegP structure (21) and not the small-clause structure (19): the DegP structure does not support *much* readings, and cannot contain a referential expression. It can only generate *many* readings for indefinite amount comparatives.

The second pattern involved high ratings of *many* and *additive much* readings, compared to *replacement much* readings, with all NP types (indefinite and referential) behaving similarly. This pattern was exhibited by amount comparatives in English and Czech (strong contrasts between the two types of *much* readings), as well as by Bulgarian *ot* and Russian *čem* amount comparatives (weak contrasts between the two types of *much* readings). The compatibility with both *many* and *much* readings, as well as the ability to combine with referential expressions, indicates that these four types of amount comparatives have the small-clause structure in (19): this structure supports *much* readings and also allows referential expressions. We note that no comparative type was found which allowed *additive much* readings but disallowed referential expressions, or vice-versa; the fact that *much* readings and compatibility with referential expressions went hand-in-hand supports our proposal that both are available on the small-clause structure in (19) and not available on the DegP structure in (21).

We now consider the unexpected finding that *replacement much* readings received significantly lower ratings than *additive much* readings. We suggest that *replacement much* readings are less acceptable not for any syntactic reason, but because they are harder to construct: they require the speaker to first determine whether two distinct entities (e.g., five books and forty journal articles) are comparable, and then to compare them. In contrast, the *additive much*

reading requires only a comparison of two clearly comparable entities (e.g., five books vs. five books + something else). The low ratings of *replacement much* readings may be due essentially to speakers' difficulty with comparing apples and oranges. However, the question remains as to why the ratings of *replacement much* readings were particularly low for English and Czech, compared to Russian and Bulgarian. We leave this issue for further research.

Finally, we note that Polish comparatives and Bulgarian *ot-kolkoto* comparatives did not fit into either pattern. Bulgarian clausal comparatives were largely rejected, which is expected if *ot-kolkoto* requires a reduced wh-clause complement, as discussed above. Polish *od* comparatives were also found ungrammatical, which was not expected; it seems that neither the DegP nor the small-clause structure is available for this comparative type. Polish *niż* comparatives, while largely acceptable, exhibited rather unclear results. Given the small number of participants for Polish and Bulgarian, and the high degree of individual variability, the unclear results could be an artefact of the study.

4.5. Structures of comparatives, revisited

Our findings suggest the distribution of structures for amount comparatives given in Table 2. We predict reduced wh-clauses to be unavailable for amount comparatives; comparatives with the small clause structure have both *many* and *much* readings, while comparatives with the DegP structure have only *many* readings. (Any comparative which allows both *many* and *much* readings is in principle compatible with the DegP structure as well as the small clause structure: there is no way to tease the two apart in such cases.)

Table 2: Structures for amount comparatives

	English	Russian	Bulgarian	Polish	Czech
reduced wh-clause	* <i>than</i>	* <i>čem</i>	* <i>ot-kolkoto</i>	* <i>niż</i>	* <i>než</i>
small clause (19)	√ <i>than</i>	√ <i>čem</i> *Genitive	√ <i>ot</i>	√ <i>niż</i> * <i>od</i>	√ <i>než</i>
DegP (21)	? <i>than</i>	? <i>čem</i> √Genitive	? <i>ot</i>	? <i>niż</i> * <i>od</i>	? <i>než</i>

√ = structure available; * = structure unavailable; ? = impossible to tell

The incompatibility between *ot-kolkoto* and amount comparatives is expected, given that *ot-kolkoto* requires a reduced clause complement. The incompatibility between *od* and the DegP structure

is also expected, given that *od* cannot combine with measure phrases: however, the reason for this incompatibility is not clear. A puzzle remains as to what rules out the small clause structure in (19) (and correspondingly, the availability of *much* readings) for both Genitive amount comparatives in Russian and *od* amount comparatives in Polish, given that these comparative types can take small-clause complements in other environments ((10b), (12b)). We do not have an answer to this at present, but we note a relationship between case assignment and (un)availability of the small clause structure in (19): both Genitive comparatives in Russian and *od* comparatives in Polish assign Genitive case, unlike *čem*, *niž* and Czech *než* comparatives. Serbo-Croatian also has *od* comparatives which assign Genitive case; like Russian Genitive, and unlike Polish *od*, Serbo-Croatian *od* is fully compatible with amount comparatives. Our prediction is that like Russian Genitive comparatives, Serbo-Croatian *od* comparatives should have the DegP structure only, and hence allow only for *many* readings, and be incompatible with referential expressions.

5 Conclusion

We have shown that comparatives differ systematically in terms of whether they allow *many* vs. *much* readings, and that the availability of *much* readings is related to the ability to combine with referential expressions. We have also provided novel evidence in favor of treating ‘clausal’ amount comparatives as having a small clause rather than a reduced clause structure.

A number of issues remain open. First, the findings of this exploratory study should be replicated in a more controlled study (with randomization and filler items), with more participants. Second, there is the question of why Genitive amount comparatives in Russian have only the DegP structure available to them, and whether this is related to the fact that these are the only comparatives in our study with no overt preposition. Third, it is still unclear what rules out Polish *od* amount comparatives. Fourth, as noted above, it is fruitful to explore the behavior of amount comparatives in other Slavic languages, e.g., Serbo-Croatian. And finally, there is the more general question of why the reduced clause structure is unavailable to amount comparatives.

6 Appendix: mean ratings across categories

The tables report means (standard deviations).

Table A1. Ratings for amount comparatives with indefinites

language & comparative	baseline category	<i>many</i>	additive <i>much</i>	replacement <i>much</i>
English	6.39(1.10)	6.54 (.99)	5.49 (1.23)	2.13 (1.07)
Russian, phrasal	6.42 (.93)	5.36 (1.47)	3.65 (1.80)	2.89 (1.77)
Russian, clausal	5.17 (1.29)	6.24 (.87)	6.32 (.95)	5.53 (1.54)
Bulgarian, phrasal	6.45 (1.05)	5.27 (2.36)	5.57 (1.55)	3.73 (1.80)
Bulgarian, clausal	2.62 (2.36)	1.73 (.86)	3.52 (2.23)	3.48 (2.47)
Polish, phrasal	1.05 (.11)	3.45 (3.24)	1.60 (.98)	3.65 (2.58)
Polish, clausal	4.45 (3.16)	6.85 (.34)	4.70 (2.58)	6.40 (.72)
Czech	6.54 (.62)	6.29 (.84)	4.58 (2.04)	2.17 (1.48)

Table A2. Ratings for amount comparatives with demonstratives

language & comparative	<i>many</i>	additive <i>much</i>	replacement <i>much</i>
English	6.03 (1.17)	5.87 (1.32)	1.85 (.97)
Russian, phrasal	4.17 (1.89)	4.05 (1.70)	2.86 (2.00)
Russian, clausal	5.76 (1.54)	6.42 (.67)	5.06 (1.84)
Bulgarian, phrasal	5.93 (1.05)	4.69 (1.81)	4.50 (1.30)
Bulgarian, clausal	3.57 (2.23)	3.39 (2.35)	4.30 (2.22)
Polish, phrasal	1.60 (1.34)	3.95 (2.89)	1.55 (1.23)
Polish, clausal	4.35 (3.10)	6.75 (.56)	4.15 (2.81)
Czech	5.96 (1.12)	5.11 (1.68)	2.54 (1.78)

Table A3. Ratings for amount comparatives with proper names

language & comparative	<i>many</i>	additive <i>much</i>	replacement <i>much</i>
English	5.26 (1.44)	6.18 (1.16)	1.78 (.89)
Russian, phrasal	3.03 (1.70)	2.89 (1.63)	2.75 (1.60)
Russian, clausal	4.99 (1.43)	5.07 (1.62)	4.58 (1.55)
Bulgarian, phrasal	4.84 (1.91)	5.55 (1.39)	3.89 (1.59)
Bulgarian, clausal	3.05 (2.05)	3.80 (2.30)	3.84 (2.43)
Polish, phrasal	3.40 (2.76)	1.35 (.78)	3.30 (2.64)
Polish, clausal	6.55 (.45)	4.45 (3.06)	6.30 (.48)
Czech	5.83 (1.20)	5.46 (1.68)	2.42 (1.69)

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