

Highs and Lows in English Attachment

Nino Grillo^{a,*}, João Costa^b, Bruno Fernandes^b, Andrea Santi^c

^a*Institut für Linguistik: Anglistik, Universität Stuttgart*

^b*Centro de Linguística da Universidade Nova de Lisboa*

^c*Department of Linguistics, University College London*

Abstract

Grillo & Costa (2014) claim that Relative-Clause attachment ambiguity resolution is largely dependent on whether or not a Pseudo-Relative interpretation is available. Data from Italian, and other languages allowing Pseudo-Relatives, support this hypothesis. Pseudo-Relative availability, however, covaries with the semantics of the main predicate (e.g., perceptual vs. stative). Experiment 1 assesses whether this predicate distinction alone can account for prior attachment results by testing it with a language that disallows Pseudo-Relatives (i.e. English). Low Attachment was found independent of Predicate-Type. Predicate-Type did however have a minor modulatory role. Experiment 2 shows that English, traditionally classified as a Low Attachment language, can demonstrate High Attachment with sentences globally ambiguous between a Small-Clause and a reduced Relative-Clause interpretation. These results support a grammatical account of previous effects and provide novel evidence for the parser's preference of a Small-Clause over a Restrictive interpretation, crosslinguistically.

Keywords: Sentence Processing, Parsing Universals, Attachment Preferences, Relative Clauses, Pseudo Relative Small Clauses.

*Corresponding author. Institut für Linguistik: Anglistik, Universität Stuttgart, Azenbergstr. 12, 70174, Stuttgart, Germany. Tel.: +49-(0)711-685-83120, Fax: +49-(0)711-685-83122.

Email addresses: nino@ifl.uni-stuttgart.de (Nino Grillo), jcosta@fcsh.unl.pt (João Costa),

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1. Introduction

The primary goal of psycholinguistics is to build a universal model of language processing in which crosslinguistic variation is grounded in language specific grammatical properties. Crosslinguistic variation in parsing preferences that does not stem from a grammatical distinction poses challenges to theories of parsing (Fodor, 1998a,b). Indeed, the language dependent preference for either high or low attachment of the Relative Clause (RC) in (1) (first observed by Cuetos & Mitchell 1988 and replicated by many others)¹ has generated extensive investigation, given there was no known grammatical distinction until recent work by Grillo (2012) and Grillo & Costa (2014). Speakers of English show an overall Low Attachment (LA) preference (i.e., attaching to *the actress* in (1)), while speakers of Spanish, i.a., demonstrate a High Attachment (HA) preference (attaching to *the maid* in (1)).

- (1) a. John saw [_{DP1} the [_{NP1} maid₁ of [_{DP2} the [_{NP2}actress₂ [_{CP} that was₂ standing on the balcony]]]]]]
b. Juan vio [_{DP1} la [_{NP1}criada₁ de [_{DP2} la [_{NP2} actriz₂] [_{CP} que estaba₁ en el balcón]]]]]

Several earlier accounts for these results have captured some essential aspect of the phenomenon but not its entirety. Previous accounts include (i) assuming modification by RCs, and other non-primary relations, being parsed using a variety of non-structural principles (Gilboy et al., 1995); (ii) differences in frequency of exposure to HA vs. LA structures (Mitchell & Cuetos, 1991); (iii) parametrization of parsing principles (Gibson et al., 1996), (iv) crosslinguistic differences in prosody (Fodor, 2002); and (v) crosslinguistic differences in the relativizing element (Hemforth et al., 1998). In more recent work, Hemforth et al. (2015) argues that crosslinguistic differences are more limited in scope than initially presumed and are largely based on

bruno86fernandes@gmail.com (Bruno Fernandes), a.santi@ucl.ac.uk (Andrea Santi)

¹See Fernández (2003) for discussion of this vast literature.

22 independent grammatical properties of the languages under scrutiny. Similarly, Grillo (2012)
23 and Grillo & Costa (2014) discuss a particular crosslinguistic grammatical variable that could
24 explain the remaining variability: Pseudo-Relative (PR) availability.

25 Grillo (2012) and Grillo & Costa (2014) identified a grammatical confound in the RC at-
26 tachment literature: an asymmetric availability of Pseudo-Relatives (PR) across languages and
27 structures. The PR is string identical to an RC, but the two differ from each other structurally and
28 interpretively. RCs (1) modify Noun-Phrases (NPs) and denote properties of entities, while PRs
29 (2-a) are either complements or adjuncts of Verb-Phrases (VPs) and denote events, much like the
30 English eventive Small-Clause (SC) in (2-b), which is the closest English translation of (2-a) and
31 should not be confused with the string-identical (reduced-)RC interpretation.

- 32 (2) a. Juan vio [_{PR} [_{DP} la criada₁ de la actriz₂] [_{CP} que_{1/*2} estaba_{1/*2} en el balcón]]
33 b. John saw [_{SC} [_{DP} the maid₁ of the actress₂] [_{VP} standing_{1/*2} on the balcony]].

34 The relevance of PRs for RC-attachment comes from the fact that the PR reading is incom-
35 patible with LA: the highest NP is the only accessible subject for the embedded verb in this
36 structure. Grillo & Costa observe a tight correspondence between PR-availability and attach-
37 ment preference where HA is observed when PRs are available and LA when only RCs are
38 available. To explain this pattern, they propose that, all else being equal, PRs are preferred by
39 the parser over RCs for their simpler structure and interpretive properties. This proposal, dubbed
40 the *PR-first Hypothesis* is supported by the reanalysis of previous findings and by novel results
41 from languages that allow PRs (see below).

42 After providing a detailed overview of the PR-first Hypothesis and the data that support it we
43 present two experiments testing a non PR-language, English, in order to: (1) determine whether

44 these earlier results can alternatively be explained by the pragmatics of the predicates that al-
45 low PRs and, after failing to support such a pragmatic account, (2) test the generalizability and
46 crosslinguistic nature of the grammatical claims made by *PR-first* in turning English, typically a
47 LA language, into a HA language through SC-availability (grammatically similar to PRs).

48 1.1. PR-first Hypothesis

49 Grillo (2012) and Grillo & Costa (2014) build on the observation that PRs are both struc-
50 turally and interpretively simpler than RCs. Structurally, PRs (being SCs) have an impoverished
51 internal structure when compared to RCs: e.g. Tense is anaphoric in PRs but deictic in RCs. In-
52 terpretively, PRs provide information relevant to the matrix event (i.e. what is perceived), and are
53 thus preferred following *Relativized Relevance* (Frazier, 1990; Traxler & Frazier, 2008). More-
54 over, PRs carry fewer unsupported presuppositions than RCs, as they do not require a contrast
55 set (Crain & Steedman, 1985; Altmann & Steedman, 1988).

56 On the basis of these observations, Grillo and Costa propose the *PR-first Hypothesis*, which
57 states that PRs should be preferred by the parser over RCs. Given that HA is obligatory with
58 PRs, we should expect to observe HA to be more frequent in languages and structures that allow
59 PRs and LA with unambiguous RC readings.²

60 Support for these predictions comes from both reanalysis of previous results from the lit-
61 erature, which shows an almost perfect correspondence between PR-availability and attachment
62 preferences, and novel experimental results which directly manipulated PR-availability in a num-
63 ber of PR-languages including Italian (Grillo & Costa, 2014), French (Grillo et al., 2015), Greek
64 (Grillo & Spathas, 2014) and European Portuguese (Fernandes, 2012; Grillo et al., 2012, 2013;
65 Tomaz et al., 2014). PR-availability depends on a number of factors, but only a well-known

²Provided that other factors (e.g. prosody, referentiality) are controlled for.

66 restriction on the properties of the matrix verb is relevant to this paper (for full discussion see
67 [Cinque 1992](#)).

68 Like eventive SCs in English, PRs denote events and need licensing via predicates that can
69 take events as their complements, e.g. (semi)perceptual predicates, both verbal (*see, hear*) and
70 nominal: (*picture of*). Stative/relational predicates (*work for*), and entity-denoting nominals
71 (*house of*), can only select for entities/NPs, and thus do not license PRs or eventive SCs, but are
72 perfectly acceptable with RC-modified NPs.

73 In an offline questionnaire in Italian, Grillo and Costa compared attachment preferences in
74 minimal pairs of sentences. The sentences contained either a PR-compatible verb, being ambigu-
75 ous between a PR/RC interpretation (3-a), or a stative verb and only permitting an RC interpre-
76 tation (3-b).

77 Contrary to (3-b), (3-a) is ambiguous between a PR-reading, in which the whole clause de-
78 notes the direct perception of an event (*the grandma screaming*) and the RC reading, in which
79 the matrix clause denotes the perception of an individual (*the grandma*) and the embedded clause
80 denotes a modifier of either of the two NPs (*the unique grandma/girl that screamed*).

81 (3) **Example stimuli from Experiment II ([Grillo & Costa, 2014](#))**

82 a. PR/RC CONDITION

83 Maria ha sentito la nonna della ragazza che gridava.

84 *M. heard the grandma of the girl that was screaming.*

85 b. RC-ONLY CONDITION

86 Maria lavora con la nonna della ragazza che gridava.

87 *M. works with the grandma of the girl that was screaming.*

88 In line with the predictions of *PR-first*, the results show a strong preference for HA in the
89 ambiguous PR/RC condition (78.6% HA) and a strong LA preference with unambiguous RCs
90 (24.2% HA).

91 In this paper, we explore an alternative explanation for this result. The effects described above
92 could equally be due to the predicate semantics, which covaries with PR-availability. Event-
93 taking “PR-predicates” may simply favour HA for reasons other than PR-availability, namely
94 plausibility. Consider the extreme case of the PR-predicate ‘*interrupt*’ in “*John interrupted the*
95 *maid of the actress that was talking*”. This sentence has a clear HA bias as the person interrupted
96 (NP1) was reasonably also the person who was talking. A similar account could in principle
97 explain the reported HA-bias with other PR-predicates like perceptual verbs. Modulation of RC-
98 attachment through pragmatics was demonstrated by [Gilboy et al. \(1995\)](#). More specific effects
99 of matrix verb type in RC-attachment have recently been observed by [Rohde et al. \(2011\)](#), who
100 showed that implicit causality verbs strongly influence RC-attachment: higher proportions of
101 HA were observed with ‘*detest*’ as a matrix verb in the following contrast: *John detests/babysits*
102 *the children of the musician who ...* when the RC provided an explanation for the state of
103 affair described in the matrix clause. Taken together, these results justify testing an alternative,
104 pragmatic account.

105 Importantly, a semantic/pragmatic account of the effect of Verb-Type observed by Grillo
106 and Costa would predict the manipulation of perceptual vs. stative verbs to produce the same
107 attachment distinction in English as has been observed in PR-languages. This was tested in
108 Experiment 1.

109 **2. Experiment 1: Verb-type effects**

110 30 monolingual British English speakers participated in a timed questionnaire after giving
111 their informed consent.

112 **Materials and Design** 24 sets of target sentences (4) were constructed, in a 2(*Predicate-*
113 *Type*: SC-compatible vs. RC-only)*2(*Environment*: Verbal vs. Nominal) Latin-square design
114 with 70 unrelated fillers. The complex NP+RC was kept identical across conditions. Sentences
115 in the verbal condition are translated from Grillo & Costa (2014). Verbs in the SC-compatible
116 condition were cognates of those used in the original Italian experiment. A few adaptations were
117 necessary in the RC-only condition when cognates were not available or would have generated
118 non-natural sentences. Whenever a change of verb was necessary, we closely matched its se-
119 mantic and syntactic properties to those of the original verb.³ Contrasting Verbal and Nominal
120 predicates, replicates design features of similar previous studies by Fernandes (2012) and Grillo
121 et al. (2012), and allows for a better evaluation of the effects of SC-availability across syntactic
122 positions.

123 (4) **Stimuli**

- 124 a. SC PREDICATE, VERBAL
125 Kelly heard the grandma of the girl that was screaming.
126 b. RC-ONLY PREDICATE, VERBAL
127 Kelly works with the grandma of the girl that was screaming.
128 c. SC PREDICATE, NOMINAL
129 The sound of the grandma of the girl that was screaming is annoying.
130 d. RC-ONLY PREDICATE, NOMINAL
131 The comb of the grandma of the girl that was screaming is black.

³The original study also included two psych-verbs (*hate/love*) in the RC-only condition. These verbs can in fact also introduce PR/SCs, albeit more marginally, and were thus avoided in the present study.

132 Stimuli were presented using Linger ([http://tedlab.mit.edu/ dr/Linger/](http://tedlab.mit.edu/dr/Linger/)) in soundproof booths
133 in UCL. After each sentence, participants were prompted to select one of two alternative sen-
134 tences (e.g. *the grandma screamed/the girl screamed*). Sentences were pseudo-randomized and
135 the order of presentation of High/Low attachment choices was counterbalanced. See Appendix
136 for full list of stimuli.

137 2.0.1. Analysis

138 A mixed effects model computed on the attachment preferences, with *Predicate-Type* and
139 *Environment* as fixed factors and *Subject* and *Item* as random factors, and random slopes for fixed
140 effects and their interactions, showed a highly significant effect of Predicate-Type ($p < .001$), with
141 more HA preferences for event-taking than entity-taking predicates; no effect of Environment
142 ($p = .6$) and no interaction ($p = .2$).

143

NP-RC	NP-SC	VP-RC	VP-SC
28.4	32.5	19.5	37.2

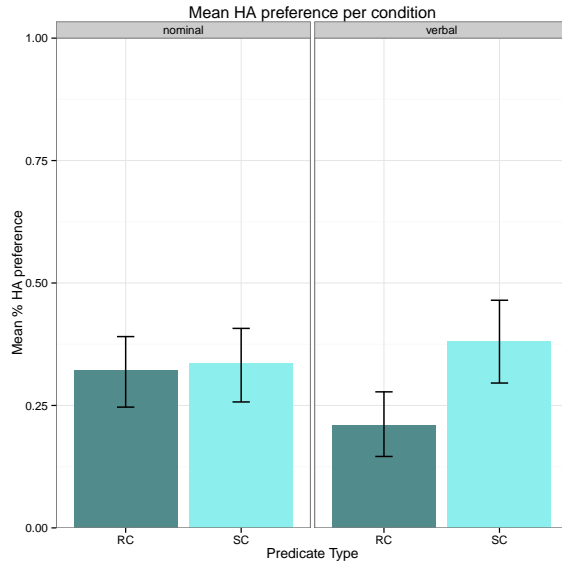


Figure 1: Mean HA preferences Experiment 1
(cf. % of HA in original Italian experiment: RC 24.2% /PR: 78.6%)

contrast	coefficient	SE	z-value	p
Predicate-Type	0.7387	0.2183	3.384	0.000714 ***

144
145 Crucially, despite the boost in HA with the event-taking predicates, overall LA was still
146 observed, as predicted by *PR-first* and in contrast to what was observed in Italian and other
147 PR-languages. The strong LA preference with the entity-taking predicates, on the other hand,
148 matches results in Italian with the same predicates. This is supported by the results of a mixed
149 effect model with *Language* as fixed factor, which revealed a significant interaction between
150 Verb-Type and Language ($p < .001$). The Language effect is limited to perceptual verbs ($p < .001$),
151 and completely absent in the RC-only condition ($p = .995$). The effect of Predicate-Type in En-
152 glish, which might be attributed to an increased plausibility of a HA continuation with perceptual
153 verbs, is of a significantly smaller magnitude than what was observed in Italian. The results are
154 incompatible with a semantic/pragmatic account of previous findings in PR-languages.

155 Having established that plausibility alone cannot account for the results from Italian (and
156 other PR-languages), in Experiment 2 we test whether the *PR-first Hypothesis* can be generalized
157 to make predictions about non-PR languages by using reduced relative clauses in English, which
158 provide an ambiguity between RC and SC interpretations, comparable to the PR/RC ambiguity.

159 The embedded gerund (5-a) (*screaming*) is ambiguous between a reduced-RC-reading and
160 an eventive SC-reading. This ambiguity disappears in (5-b), where the embedded predicate can
161 only be interpreted as a reduced-RC.

- 162 (5) a. Kelly heard the grandma of the girl screaming.
163 b. Kelly works with the grandma of the girl screaming.

164 Following the rationale of *PR-first*, we would expect a clear preference for HA with (5-a),
165 while an overall LA preference should still be observed with (5-b). To test this, Experiment 2
166 modified the stimuli from Experiment 1 to generate reduced RCs.

167 2.1. Experiment 2: Testing SC-availability in English

168 This experiment generalizes the predictions of *PR-first* to English, by comparing attach-
169 ment in ambiguous SC/Reduced-RC sentences (i.e., event-taking predicates) with unambiguous
170 Reduced-RCs-only sentences (entity-taking predicates).

171 **Materials and Design** 30 native British-English speakers were tested with stimuli from
172 Experiment 1 with the following change: we removed the complementizer and auxiliary of the
173 relative clause to generate Reduced-RCs or SCs (depending on the predicate present). With
174 event-taking predicates the relevant string (*the x singing*) was globally ambiguous between an SC
175 and a Reduced-RC-parse but only allowed a Reduced-RC reading under entity-taking predicates.

176 We acknowledge that Reduced-RCs might not be the easiest structure to parse, but this cost
 177 should be independent of attachment. Contrary to Experiment 1, *PR-first* predicts overall HA
 178 with event-taking predicates, but LA with entity-taking predicates.

179 *2.2. Results*

180 The same analysis as in Experiment 1 was used. As predicted, we observed a HA preference
 181 in SC-compatible contexts (i.e. above 50%), and a strong LA preference in RC-only contexts.

182

NP RC	NP SC	VP RC	VP SC
13.8	56.1	21.1	55.5

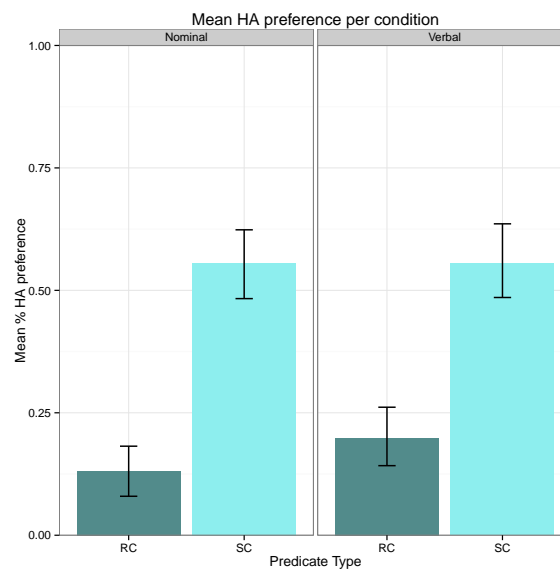


Figure 2: Mean HA preferences Experiment 2

183 A strongly significant effect of predicate-type ($p < .0001$) was observed, with greater HA pref-
 184 erence for event-taking than entity-taking predicates. There was no significant effect of environ-
 185 ment ($p = .5$) and no interaction between the two factors ($p = .3$).

contrast	coefficient	SE	z-value	Pr(> z)
Predicate-Type	2.3894	0.3238	7.380	1.58e-13 ***

In order to provide a statistical test of the greater effect of grammar over predicate semantics, we ran a mixed model logistic regression adding *Experiment*[1 vs. 2] to *Predicate-type* and *Environment* as fixed factors, with random slopes and intercepts fit for the fixed effects.

Besides a main effect of Predicate-Type ($p < .001$), the analysis indicated both a significant 2way Predicate-Type*Experiment interaction ($p < .001$) and a 3way Predicate-type*Environment*Experiment interaction ($p < .05$). The 2way interaction is due to a higher proportion of HA in the PR-compatible condition in Experiment 2 than 1. The 3way interaction is due to a significantly higher proportion of HA in the nominal environment in Experiment 1 than 2 in the RC-only condition. This effect might be attributed to the relative length of the RC in the two experiments (longer RCs in Experiment 1 than 2), i.e. as an effect of implicit prosody. It has been demonstrated that longer RCs display a stronger tendency for HA than shorter RCs (Fodor, 2002; Hemforth et al., 2015, among others). Notice, however, that the effect goes in the opposite direction with SC-compatible, event-taking predicates. We take this as evidence that *both* Prosody and PR/SC-availability are grammatical factors involved in the resolution of attachment ambiguities.

contrast	coefficient	SE	z-value	Pr(> z)
Predicate-Type	1.50065	0.18544	8.092	5.85e-16 ***
Predicate-Type*Experiment	-1.55802	0.36040	-4.323	1.54e-05 ***
Predicate-Type*Environment*Experiment	1.25753	0.56927	2.209	0.0272 *

3. General Discussion

The best evidence to date in favour of *PR-first* comes from data contrasting RC-attachment preferences under event-taking predicates (PR-compatible), which drive strong HA preference in PR-languages, and entity-taking (RC-only) predicates, which, on the contrary, drive a strong LA preference in the same languages (Grillo & Costa, 2014, and work cited above). We pointed

207 out that an exclusively pragmatic account of the attachment preferences is viable in principle, as
208 PR-availability covaries with the semantic properties of the matrix verb. Rohde et al. (2011) have
209 already shown that properties of the matrix verb can play an important role in shaping attachment
210 preferences. Implicit causality verbs trigger HA preference in languages in which a strong LA
211 preference is generally observed (Rohde et al., 2011).

212 Experiment 1 was designed to test this alternative account in a non-PR language, English, so
213 as to avoid conflating the effect of the two factors. The experiment is a close replication of an
214 Italian experiment (Experiment 2 in Grillo & Costa 2014), which showed a strong attachment
215 asymmetry between sentences containing event-taking (78.6% HA) vs. entity-taking predicates
216 (24.2% HA). An additional manipulation was tested in English, nominal vs. verbal domain.
217 Experiment 1, however, did not replicate the findings from Italian: while predicate semantics
218 appeared to play a minor modulatory role in attachment, a generalized LA preference was found
219 across both conditions (nominal and verbal). This argues against the alternative pragmatic ac-
220 count.

221 Experiment 2 replicated Experiment 1, but used reduced RCs instead of full RCs. Reduced
222 RCs under event-taking predicates demonstrate a similar type of grammatical ambiguity (SC vs.
223 RC) as found in PR-languages (PR vs. RC). SC-availability leads to a change from LA to HA
224 in English, mirroring the Italian results under PR-availability. SC-availability resulted in the
225 same attachment effects across both nominal and verbal environments, which further shows the
226 primacy of this factor in determining attachment preferences. A strong LA preference, which
227 corresponds to the Italian results in the same environment, emerges in unambiguous RC-only
228 contexts in both Experiment 1 and 2. These results further illustrate the strength of locality
229 principles in attachment when SC-availability is controlled for.

230 Collectively, these and previous results from similar experiments on PR-languages, show that

231 attachment preferences are not language dependent, but rely heavily on (universal) grammatical
232 factors, such as the availability of an eventive SC interpretation (among other universal factors
233 such as prosody and referentiality). The results advocate for a crucial role for syntactic structure
234 above and beyond the semantic plausibility of HA with SC-predicates.

235 Finally, the results from Experiment 2 require that PR-first be framed in more general terms
236 of eventive clauses rather than specific constructions (i.e. PRs). Likewise, there are no longer
237 HA and LA languages, but grammatical environments that favour HA or LA. Crucially, parsing
238 preferences are equivalent across languages.

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297 **Appendix A. Experimental Items**

298 List of stimuli for Experiment 1 and 2, material in parentheses (*that was*) was omitted in
 299 Experiment II. Mean % of HA is indicated for each item.

300

301	<i>Sentences</i>	<i>Experiment 1/2</i>
302	1. a. Jim saw the son of the doctor (<i>that was</i>) having dinner.	55.5/75
303	b. The picture of the son of the doctor (<i>that was</i>) having dinner is old.	16.6/71.4

304	c. Jim shares the house with the son of the doctor (that was) having dinner.	16.6/12.5
305	d. The car of the son of the doctor (that was) having dinner is old.	28.5/14.2
306	2. a. Kelly heard the grandma of the girl (that was) screaming.	14.2/71.4
307	b. the sound of the grandma of the girl (that was) screaming is annoying.	22.2/50
308	c. Kelly works with the grandma of the girl (that was) screaming.	16.6/0
309	d. The comb of the grandma of the girl (that was) screaming is black.	0/12.5
310	3. a. John heard the teacher of the boy (that was) singing.	16.6/75
311	b. The film of the teacher of the boy (that was) singing is of low quality.	28.5/14.2
312	c. John runs with the teacher of the boy (that was) singing.	0/25
313	d. The jacket of the teacher of the boy (that was) singing is red.	0/0
314	4. a. The writer watched the aunt of the girl (that was) jumping.	16.6/71.4
315	b. The drawing of the aunt of the girl (that was) jumping is pretty.	16.6/12.5
316	c. The writer is married to the aunt of the girl (that was) jumping.	0/28.5
317	d. The house of the aunt of the girl (that was) jumping is pretty.	11.1/0
318	5. a. Mary listened to the daughter of the policeman (that was) talking.	55.5/50
319	b. The recording of the daughter of the policeman (that was) talking is funny.	33.3/57.1
320	c. Mary is employed by the daughter of policeman (that was) talking.	0/12.5
321	d. The dog of the daughter of the policeman (that was) talking is funny.	42.8/0
322	6. a. Mark observed the friend of the politician (that was) cooking.	42.8/28.5
323	b. The scene of the friend of the politician (that was) cooking is long.	33.3/62.5
324	c. Mark is engaged to the friend of politician (that was) cooking.	16.6/14.2
325	d. The boat of the friend of the politician (that was) cooking is long.	16.6/0

326	7. a. Jane caught the maid of the actress (that was) stealing.	50/87.5
327	b. The sight of the maid of the actress (that was) stealing is horrible.	42.8/100
328	c. Jane trains with the maid of the actress (that was) stealing.	11.1/25
329	d. The scarf of the maid of the actress (that was) stealing is horrible.	33.3/14.2
330	8. a. The lawyer caught the chauffeur of the neighbour (that was) swimming.	16.6/71.4
331	b. The video of the chauffeur of the neighbour (that was) swimming is boring.	0/62.5
332	c. The lawyer exercises with the chauffeur of neighbour (that was) swimming.	14.2/28.5
333	d. The dog of the chauffeur of the neighbour (that was) swimming is smelly.	66.6/12.5
334	9. a. David observed the son of the maid (that was) exercising.	44.4/62.5
335	b. The footage of the son of the maid (that was) exercising is missing.	33.3/71.4
336	c. Mary is divorced from the son of the maid (that was) exercising.	16.6/12.5
337	d. The wallet of the son of the maid (that was) exercising is missing.	57.1/14.2
338	10. a. Alan observed the nephew of the nurse (that was) eating.	28.5/42.8
339	b. The image of the nephew of the nurse that eating is amusing.	77.7/75
340	c. Alan relates to the nephew of the nurse that eating.	33.3/14.2
341	d. The life of the nephew of the nurse (that was) eating is amusing.	16.6/25
342	11. a. Peter photographed the co-worker of the butcher (that was) running.	33.3/25
343	b. The sound of the co-worker of the butcher (that was) running is disturbing.	57.1/85.7
344	c. Peter trains with the co-worker of the butcher (that was) running.	44.4/0
345	d. The moustache of the co-worker of the butcher (that was) running is disturbing.	50/14.2
346	12. a. Kate looked at the friend of the judge (that was) driving.	50/57.1
347	b. The recollection of the friend of the judge (that was) driving is fuzzy.	33.3/25

348	c. Kate is engaged to the friend of the judge (that was) driving.	14.2/14.2
349	d. The hair of the friend of the judge (that was) driving is fuzzy.	44.4/25
350	13. a. Lily imagined the friend of the flower girl (that was) working.	22.2/62.5
351	b. The noise of the friend of the flower girl (that was) working is unbearable.	16.6/71.4
352	c. Lily parties with the friend of the flower girl (that was) working.	0/12.5
353	d. The toothache of the friend of the flower girl (that was) working is unbearable.	14.2/28.5
354	14. a. Rachel dreamt of the friend of the brother (that was) drinking.	14.2/14.2
355	b. The scene of the friend of the brother (that was) drinking is sad.	55.5/37.5
356	c. Rachel is married to the friend of the brother (that was) drinking.	16.6/14.2
357	d. The office of the friend of the brother (that was) drinking messy.	16.6/12.5
358	15. a. David drew the grandson of the woman (that was) smoking.	0/12.5
359	b. The depiction of the grandson of the woman (that was) smoking is ugly.	14.2/42.8
360	c. David is employed by the grandson of woman (that was) smoking.	11.1/0
361	d. The watch of the grandson of the woman (that was) smoking is ugly.	16.6/0
362	16. a. Phillip filmed the agent of the player (that was) snoring.	66.6/71.4
363	b. The sound of the agent of the player (that was) snoring is terrible.	66.6/50
364	c. Phillip hangs out with the agent of the player (that was) snoring.	42.8/42.8
365	d. The t-shirt of the agent of the player (that was) snoring is terrible.	33.3/12.5
366	17. a. The fireman recorded the cousin of the lawyer (that was) whistling.	55.5/75
367	b. The portrayal of the cousin of the lawyer (that was) whistling is lovely.	50/57.1
368	c. The fireman is employed by the cousin of the lawyer (that was) whistling.	33.3/87.5
369	d. The smile of the cousin of the lawyer (that was) whistling is lovely.	14.2/28.5

370	18. a. Bob glanced at the friend of the shoemaker (that was) dancing.	42.8/28.5
371	b. The energy of the friend of the shoemaker (that was) dancing is amazing.	44.4/37.5
372	c. Bob is engaged to the friend of the shoemaker (that was) dancing.	50/14.2
373	d. The pool of the friend of the shoemaker (that was) dancing is amazing.	0/12.5
374	19. a. Sally photographed the stepson of the nurse (that was) studying.	33.3/62.5
375	b. The idea of the stepson of the nurse (that was) studying is surprising.	28.5/71.4
376	c. Sally collaborates with the stepson of the nurse (that was) studying.	55.5/12.5
377	d. The advice of the stepson of the nurse (that was) studying is surprising.	50/14.2
378	20. a. The singer watched the brother of the CEO (that was) bleeding.	50/85.7
379	b. The memory of the brother of the CEO (that was) bleeding is uncomfortable.	16.6/37.5
380	c. The singer studies with the brother of the CEO (that was) bleeding.	42.8/14.2
381	d. The couch of the brother of the CEO (that was) bleeding is uncomfortable.	44.4/25
382	21. a. The policeman filmed the friend of the sister (that was) sewing.	55.5/50
383	b. The vision of the friend of the sister (that was) sewing is boring.	33.3/57.1
384	c. The policeman is married to the friend of the sister (that was) sewing.	0/25
385	d. The work of the friend of the sister (that was) sewing is boring.	42.8/14.2
386	22. a. The architect imagined the sister of the colleague (that was) dancing.	28.5/42.8
387	b. The sight of the sister of the colleague (that was) dancing is extraordinary.	66.6/75
388	c. The architect is divorced from the sister of the colleague (that was) dancing.	16.6/28.5
389	d. The mansion of the sister of the colleague (that was) dancing is extraordinary.	0/25
390	23. a. David saw the teacher of the friend (that was) driving.	0/50
391	b. The film of the teacher of the friend (that was) driving is disturbing.	14.2/42.8

392	c. David parties with the teacher of the friend (that was) driving.	33.3/37.5
393	d. The book of the teacher of the friend (that was) driving is disturbing.	16.6/28.5
394	24. a. The neighbour listened to the son of the doorman (that was) singing.	33.3/71.4
395	b. The video of the son of the doorman (that was) singing is awful.	33.3/75
396	c. The neighbour attends university with the son of the doorman (that was) singing.	
397	28.5/28.5	
398	d. The car of the son of the doorman (that was) singing is ugly.	44.4/0